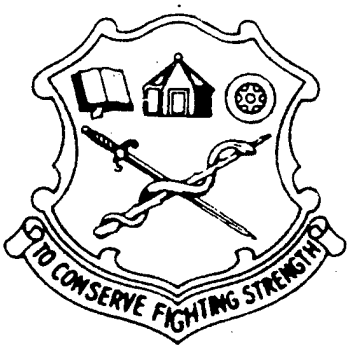
CENTER FOR
HEALTHCARE EDUCATION
AND STUDIES

# PRIMARY CARE DEMONSTRATION PROJECT: MEASUREMENT OF PROVIDER PRACTICE STYLES AND CLIENT OUTCOMES

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This multicenter study of physicians, nurse practitioners, and physician assistants used a prospective, longitudinal, correlational design to evaluate change in client outcomes as a function of provider practice styles, client and provider demographics, and clinic characteristics. Three sites participated in the study: Fort Belvoir, VA; Fort Bragg, NC; and Fort Lewis, WA. Nine primary care clinics (three from each site) were enrolled in the study. Providers completed a demographics questionnaire and six practice style questionnaires that measured their practice model, confidence, autonomy, collaboration practices, attitudes towards giving information, and job satisfaction. Clients completed demographics and symptoms questionnaires and four outcome questionnaires measuring functional status, health status, attitudes towards seeking information, and satisfaction with healthcare services. One week and six months later clients completed follow-up questionnaires. The reliability and validity of questionnaries were confirmed. Questionnaires were completed by 58 primary care providers: 26 physicians, 19 nurse practitioners, and 13 physician assistants (46%, 76%, and 41%, respectively, of those eligible). Completed questionnaires from the day of the visit were received from 226 clients (51% of those eligible). Of the 226 clients who returned completed questionnaires, 218 (96%) saw providers who also returned completed questionnaires. Of those 218 clients, 167 (77%) returned completed questionnaires at six months. Recommendations were made in four areas: education and training of primary care providers, significance of musculoskeletal injury, provider autonomy, and ratio of non-physician providers to physicians in primary care clinics (for adult, non-obstetric, healthcare).

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# Primary Care Demonstration Project: Measurement of Provider Practice Styles and Client Outcomes

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**PRIMARY CARE DEMONSTRATION PROJECT:**
**MEASUREMENT OF PROVIDER PRACTICE STYLES**
**AND CLIENT OUTCOMES**

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a. Human subjects volunteered to participate in this study after giving their free and informed consent. Investigators adhered to the guidelines of Army Regulation 40-38, Clinical Investigation Program (1 September 1989) and the "Ethical Principles of Psychologists and Code of Conduct"[1].

b. The design of this survey research project was coordinated with the Army Personnel Survey Office (Soldier Support Center - National Capital Region) in 1995. Questionnaires used in this project were classified as exempt from the provisions of Army Regulation 600-46, Attitude and Opinion Survey Program.

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[1] American Psychological Association. (1992). Ethical principles of psychologists and code of conduct. *American Psychologist, 47,* 1597-1611.

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# CHAPTER 1
# EXECUTIVE SUMMARY

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## Purpose

Primary care services are integral to every medical treatment program in the Army Medical Department (AMEDD) and are especially critical to the managed care initiatives currently being implemented throughout the Army. In an era of constrained resources, it is essential to use an optimal mix of physician and non-physician providers in primary care settings. This report summarizes the wealth of research demonstrating that non-physician providers provide high quality, cost effective health care in primary care settings. It expands upon this research with a discussion of the results of a recent study conducted in AMEDD primary care clinics, which assessed the structure, process, and outcomes of adult, non-obstetric, primary care services provided by physicians, nurse practitioners, and physician assistants.

## Method

The study evaluated change in client outcomes as a function of provider practice styles, client and provider demographics, and clinic characteristics (see pp. 9-4 to 9-10 for a detailed description). The study was unlike its predecessors in that the interpersonal style of the providers was the focus of the study, multiple measures of client outcomes were used, validated instruments were used, a longitudinal (repeated measures) design was used, and all three types of providers were studied simultaneously.

Three sites participated in the study: Fort Belvoir, VA, Fort Bragg, NC, and Fort Lewis, WA. Nine primary care clinics (three from each site) were enrolled in the study. Clinics were divided into three types on the basis of the types of clients seen (e.g., active duty personnel versus retired personnel) and the ratio of non-physician providers to physician providers practicing in the clinic (pp. 9-10 to 9-11).

Data from Composite Health Care System (CHCS) records for the nine clinics indicated that a sample size of 215 to 240 clients would be equivalent to a typical day's census of non-pediatric, non-obstetric clients visiting enrolled clinics for a new complaint (pp. 9-4 to 9-5). Data were collected over an eight month period to insure that a wide variety of cases and situations were included. Data collection was terminated when completed questionnaires were received from 226 clients.

Providers and clients volunteered to participate in the study and gave their written informed consent. Investigators adhered to the guidelines of Army Regulation 40-38, "Clinical Investigation Program" and the American Psychological Association's "Ethical Principles of Psychologists and Code of Conduct."

There were 58 primary care providers in the sample: 26 physicians, 19 nurse practitioners, and 13 physician assistants (46%, 76%, and 41%, respectively, of those eligible, pp. 9-5 to 9-7). An analysis of the CHCS data from the nine clinics demonstrated that the providers who volunteered for the study saw the same types of clients in the same frequencies as the providers who did not. This sample size yielded a power of 0.90 for statistical comparisons of the three types of providers (p. 9-14). Physicians ranged in

age from 28 to 69 years old, with an average age of 41. Eighty percent of the physicians were male and 20% were female. They had an average of 8.8 years experience as a provider in a military medical facility. Nurse practitioners ranged in age from 30 to 52 years old, with an average age of 41. Forty-seven percent of the nurse practitioners were male and 53% were female. They had an average of 6.0 years experience as a provider in a military medical facility. Physician assistants ranged in age from 32 to 50 years old, with an average age of 39. Seventy-seven percent of the physician assistants were male and 23% were female. They had an average of 6.2 years experience as a provider in a military medical facility.

There were 226 clients in the sample (51% of those eligible). This sample size yielded a power of 0.90 for statistical comparison of three groups of clients (e.g., clients from three types of clinics or from three types of providers, p. 9-14). Clients ranged in age from 19 to 82 years old, with an average age of 43. Females made up 72% of the sample. Active duty service members made up 20% of the sample, adult family members of active duty service members 39%, retired service members 17%, and adult family members of retired service members 24%.

All of the practice style and outcome questionnaires used in the study were developed from questionnaires that had been previously validated (e.g., the RAND SF-36 measure of health status). Their reliability and validity were confirmed in this sample (pp. 9-11 to 9-12). At the beginning of the study, providers completed a demographics questionnaire and six practice style questionnaires. The practice style questionnaires measured practice model, confidence, autonomy, collaboration practices, attitudes towards giving information, and job satisfaction. On the day of a visit to the primary care clinic, clients completed demographics and symptoms questionnaires and four outcomes questionnaires. The outcome questionnaires measured functional status, health status, attitudes towards seeking information, and satisfaction with healthcare services. One week later, clients completed the functional and health status questionnaires again, along with a follow-up symptom questionnaire. Six months later, clients completed the functional status, health status, information seeking, and client satisfaction questionnaires again, along with a follow-up symptom questionnaire.

## Limitations

The analysis of data and the recommendations derived from this study were limited in scope in recognition of the correlational design used. The factors which limit the degree to which generalizations can be made from this study are described in detail in pp. 9-11 to 9-12 and briefly summarized in the following paragraphs.

1. No study which relies solely on volunteers to study sensitive behaviors in a longitudinal design can claim to have a truly unbiased or "random" sample.

2. As is typical of studies of attitudes and perceptions, this study relied on self-report questionnaire data.
3. Sites for the study were purposely chosen to provide the most diverse sample. However, this necessitated using only clinics associated with large Medical Centers.
4. This study was a naturalistic observation of the situation existing in the clinics (in 1995-1996). No attempt was made to "manipulate" clinic characteristics.
5. The majority of clients in the sample were female. Although this is representative of the population using the Army's primary care clinics, it precluded any analysis of gender differences in outcomes.
6. Several different rationales for choosing sample size and methods for reducing sampling bias were used, thus the size of the samples was "statistically" appropriate. However, the 50% "participation rate" by eligible providers and clients and the small sample size (relative to all possible providers and clients), while typical of demonstration projects and pilot studies, precluded drawing conclusions about prevalence.
7. There was 23% attrition from the client sample by the time of the six month data collection. There was a 66% attrition of medical records over the eight month data collection period. Accordingly, major findings and recommendations presented in this Executive Summary are based entirely on the data collected from clients on the day of the visit and one week later.
8. Although primary care clinics in the Army spend a substantial amount of their resources on pediatric and obstetric care, the conclusions and recommendations from this study apply only to adult, non-obstetric, primary care services provided in Army primary care clinics (variously referred to in the Army as "troop medical clinics," "family care clinics," "adult primary care clinics," etc.). No application to inpatient services, to other types of outpatient clinics, or to pediatric or obstetric care in primary care clinics is implied or should be inferred.

## Major Findings

1. The practice model of primary care providers emphasized holistic values and included issues of mentoring, autonomy, and quality assurance (pp. 2-80 to 2-81 and 2-84 to 2-85).
2. The level of provider autonomy predicted the level of job satisfaction, confidence in skills, collaboration, and information giving (pp. 2-83 to 2-85, 3-16 to 3-19, 4-26 to 4-27, 5-16 to 5-19, 6-33, 6-47, 7-29, and 8-42 to 8-43).
3. There was a general consensus across all three types of providers that they worked together as a team, sharing information and expertise (pp. 4-25 to 4-28).
4. The average level of job satisfaction was not significantly different across the three types of providers. Providers were most satisfied with the quality of care they were able to provide and the quality of their peers. Providers were least satisfied with issues related to direct patient care, continuity of care, the ability to influence policy, and financial benefits (pp. 5-15 to 5-19).

5. The majority of clients were only moderately satisfied with health care services. The highest ratings of client satisfaction occurred on items concerned with the provider's interpersonal behavior. The lowest ratings occurred on items concerned with choice and access (pp. 7-18 to 7-19 and 7-36).
6. In this sample of adults seeking primary care services, there were no significant differences in information seeking scores for different beneficiary categories, age groups, genders, ethnic groups, educational levels, income groups, or levels of severity of symptoms. However, clients with comorbid conditions had significantly higher information seeking scores than those without comorbid conditions (pp. 6-34 to 6-38 and 6-46 to 6-47).
7. Clients showed a significant degree of recovery of functional and health status in the week following their visit to the clinic. There were significant differences in both functional status and health status as a function of the client's reason for visiting the clinic and level of comorbidity. Clients with back pain, upper respiratory problems, or gastrointestinal upset had the worst functional and health status. Clients with comorbid back pain had the worst functional and health status (pp. 8-34 to 8-40, 8-52 to 8-57, 8-65, and 8-70 to 8-71).
8. All three types of providers saw clients from all beneficiary categories, income levels, educational backgrounds, levels of severity of symptoms, and levels of comorbidity (pp. 2-77 to 2-80 and 2-84 to 2-85).
9. There were no significant differences in the level of satisfaction or in the degree of recovery of functional or health status among clients who saw physicians, nurse practitioners, or physician assistants (pp. 7-27, 8-38 to 8-39, and 8-56 to 8-57).
10. There were no significant differences in the level of satisfaction or in the degree of recovery of functional or health status among clients who visited Type I, II, or III clinics (pp. 7-27, 8-37 to 8-38, and 8-55 to 8-56).

## Recommendations

**1. The education and training of primary care physicians and non-physician providers should be designed to produce and sustain extraordinary communication skills.**

When clients were surveyed concerning their satisfaction with health care services in primary care clinics, they gave their highest ratings to the interpersonal skills of the providers (pp. 7-18 to 7-19 and 7-36). They gave their lowest ratings to items concerned with continuity of care (pp. 7-18 to 7-19 and 7-36). Surveys of provider job satisfaction revealed that providers were also dissatisfied with continuity of care (pp. 5-15 to 5-19). Tours of duty for providers in primary care clinics were typically two years long, making it difficult to establish long-term relationships with clients (pp. 9-6 to 9-7). Difficulties encountered in this study during the data collection process provided ample evidence of the difficulties in providing continuity

of care when both the clients and the providers are highly mobile (p. 9-12). An attempt by investigators to review medical records six months after the client's enrollment in the study was stymied, because only 77 of 218 records were available for review (p. 9-12) In a system of this type then, communication between provider and client is essential, if the provider is to provide holistic care. Along with history-taking skills, physical evaluation skills, and attention to detail during the medical record review, Army providers (whether military or civilian) must have extraordinary communication skills. Primary care providers must be able to skillfully interact with their clients in order to insure that a comprehensive two-way exchange of information takes place. Therefore, in order to minimize the impact of limited continuity of care, graduate medical education, long term civilian training, and continuing education programs for primary care providers must emphasize communication skills.

**2. The education and training of primary care physicians and non-physician providers should prepare providers to provide the full range of primary care services.**

Patterns of practice for an individual provider were determined by a combination of the provider's skill set and the clinic's needs. However, all three types of providers in this study saw a broad range of health conditions, the spectrum of symptoms from mild to severe, and all four types of health care beneficiaries (pp. 2-77 to 2-80 and 2-84 to 2-85). Furthermore, tours of duty for primary care providers tended to be short (pp. 9-6 to 9-7); providers were called upon to move to new assignments on short notice. The new assignments were often to quite dissimilar clinics. Thus, it is clear that graduate medical education, long term civilian training, and continuing education programs for primary care providers need to produce and sustain generalists.

**3. Programs for the surveillance, prevention, education, and treatment of musculoskeletal injury should be expanded in primary care clinics.**

"Musculoskeletal injury" in this study included strains, sprains, fractures, and back pain. The results of this study highlighted the significance of this type of acute condition. Musculoskeletal injuries occurred among all beneficiary categories (pp. 8-65 to 8-66). Clients with musculoskeletal injury accounted for 20% of clinic visits in this sample (of adults visiting primary care clinics for other than obstetric care) and 29% of self-reported comorbid conditions (p. 2-79). Clients with musculoskeletal injury presented with poorer functional status than clients with other acute conditions (p. 8-35). Clients with musculoskeletal injury showed less recovery of health status over the first week than clients with other acute conditions (pp. 8-65 to 8-68). Clients with musculoskeletal injury were less satisfied with healthcare services than clients with other acute conditions (p. 7-26). Clients with musculoskeletal injury were more likely to be high information seekers than clients with other acute conditions (p. 6-37). The frequency of

musculoskeletal injury in this sample was not surprising given the nature of the population. However, if increased emphasis on prevention and treatment could reduce the incidence, prevalence, and severity of these conditions, then a substantial improvement in the health of service members, retirees, and their families and a significant savings in healthcare resources could be realized. Moreover, investigations into the feasibility of placing command emphasis on the prevention of musculoskeletal injury (like that placed on the prevention of environmental injury or hearing conservation) should be conducted.

4. **The current methods for conferring individual provider autonomy (on adult primary care providers) should be maintained.**

One of the patterns which clearly emerged from this study was the critical role that provider autonomy played. Autonomy in this situation referred to the provider's belief that s/he was treated like a professional by colleagues and supervisors and was free to exercise his/her judgment when treating clients (within the normal scope of practice). A range of autonomy was found within each group of providers (physicians, nurse practitioners, and physician assistants, pp. 3-16 to 3-17). Level of autonomy was highly correlated with provider job satisfaction (pp. 3-16 to 3-18). It was positively linked to levels of provider responsibility, collaboration among providers, communication with clients, and client outcomes (pp. 2-83 to 2-85, 3-16 to 3-19, 4-26 to 4-27, 5-16 to 5-19, 6-33, 6-47, 7-29, and 8-42 to 8-43). These correlational data do not establish a cause and effect relationship, but they do make it clear that changes in the healthcare system which reduce or appear to reduce the provider's autonomy in clinical matters are likely to negatively influence provider satisfaction and client outcomes. Changes in the current system of earning and granting autonomy to providers should be implemented only after careful evaluation of their potential impact on provider and client outcomes.

5. **The capacity of primary care clinics to provide adult primary care services should be expanded by assigning non-physician providers to the clinics in a ratio of 2:1 (two non-physician providers for each physician).**

In this study of adult primary care services, non-physician providers saw a broad range of health conditions and clients (pp. 2-77 to 2-80 and 2-84 to 2-85), consistently achieved health outcomes equivalent to those of physicians (pp. 7-27, 8-38 to 8-39, and 8-56 to 8-57), were equally well accepted by clients (p. 7-27), and were equally satisfied with their jobs (pp. 5-15 to 5-19). Furthermore, there were no differences in client outcomes between clinics with 2:1 ratios of non-physician providers to physicians and those with 1:2 ratios of non-physician providers to physicians (pp. 7-27, 8-37 to 8-38, and 8-55 to 8-56). The results of this study were further supported by ample evidence in the research literature on civilian practices (pp. 2-40 to 2-41 and 2-76). In civilian primary care clinics, non-physician providers provided

safe, highly quality, cost effective care when practicing in a 2:1 ratio (of non-physician providers to physicians). Thus, the capacity of primary care clinics to provide high quality adult primary care services could be expanded by using non-physician providers in a ratio of 2:1 (two non-physician providers for each physician). Moreover, the impact of using even higher ratios of non-physician providers to physicians in adult primary care should be evaluated in structure models, staffing simulations, and future demonstration projects.

## CHAPTER 2
## PRACTICE MODEL

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Health Care Reform

Health care provision in this country is undergoing dramatic changes due to charges of mismanagement and inattention to the consumer. The cost of health care has increased dramatically over the last decade, apparently without improving the health status of the nation (Califano, 1994). Every aspect of the health care system is in a state of turbulence. Congress and the taxpayers demand accountability from clinicians and health care institutions. Insurance companies monitor every aspect of care and, in many cases, attempt to dictate practice. Businesses are crippled by expensive health care benefit packages, while the uninsured work force continues to grow. The struggle to create a different health care delivery system began in the 1960s with the introduction of Medicare. Yet, thirty years of study and modification have not produced solutions to the crisis.

The civilian medical community has been under intense pressure to change for about a decade and has developed systems designed to avoid the financial constraints brought on by capitation budgets, including shifting the emphasis to ambulatory care. Outpatient surgeries and procedures have become the norm, so that the care of the consumer has become the responsibility of the family in the home. Civilian health care institutions and providers have become very sophisticated in deterring debt by not serving certain client populations, denying access to those without insurance, increasing the number of procedures or surgeries that benefit the organization financially, and mandating shorter lengths of stay for inpatients. In short, the health care system has been accused of abandoning its goal to provide the best treatment for all citizens and adopting a corporate philosophy which emphasizes profit (Alspach, 1995).

Historically, the boundaries between military and civilian health care systems have been considerable. The military health care system was largely unaffected by the tumultuous events in the surrounding civilian sector. However, the *business* of health care affects everyone now. Military health care consumers and providers are faced with new challenges in their efforts to acquire and provide care -- challenges which require abrupt change. It will be necessary to adopt from the civilian sector those methods which have been successful (Jennings & McClure, 1991).

Health Maintenance Organizations (HMO) have proven to be successful both from a clinical and a business standpoint. Their model of managed care with a heavy emphasis on primary care is similar to the socialized medicine that the military medical department has utilized since its inception. Thus, some of the modifications can be adopted without difficulty. However, there are many aspects of health care that the civilian sector still finds challenging. A solution to the dichotomous relationship that exists between consumers and providers has yet to be found. Consumers who experience roadblocks to access and appropriate inexpensive care are

demanding more and more of the health care system. Moreover, they often want quick cures for lifelong behaviors that create disease and injuries. Providers are stifled by litigeny, bureaucracy, and increasing demand for cure. Instead of having the ability to be responsive to the health care needs of the population, the gap between demand and resources is widening. Global solutions to the current health care crisis in this country are not readily apparent (Porter-O'Grady, 1994; Redman, 1993). The military medical community must adopt the successful strategies of others that are relevant and carefully evaluate the success of their implementation in the military population.

Health care delivery systems are being forced to change rapidly to maximize efficiency and effectiveness. This type of organizational environment can be classified as a turbulent field. A turbulent field exists when the accelerating rate and complexity of interactive effects exceeds the component systems' capacities for prediction and, hence, control of the compounding consequences of their actions (Bennis, Benne, Chin, & Corey, 1976). When organizations employ untested technologies, have diverse goals, and suffer from ambiguous feedback on relative performance, managers may ritualistically model other similar organizations, rather than systematically evaluate why organizations are successful and how the organization's strategies for success can be adapted to fit their own organization (Van Maanen & Barley, 1985). Turbulence within the health care industry has led to massive, often chaotic, health care reform.

Health Care Reform Models. Health care reform can be classified into four models (Donley, 1993). The first is a challenge to the structures that sustain the dominance of the medical model. This is called the de-medicalization model. The second is the cost-reform model. It is governed by the ideology of equitable cost and challenges profit maximization. The third is the universal accessibility model. It seeks to create an equitable delivery system. The fourth is the professional or personal fulfillment model, which attempts to eliminate the factors underlying the disillusionment experienced by many persons involved in the health care system. Complete reform will capture some of each model and will provide services that offer primary care, in an affordable, accessible, and value-oriented manner. These concepts have been incorporated into the model of managed care.

## Managed Care

Civilian health care recipients encounter difficulties in obtaining health care due to uneven access, increasing costs, ineffective and inefficient delivery systems, and confusion about insurance plan options. These problems are experienced by the military beneficiary as well. President Clinton's health care proposal and the Department of Defense's (DOD) health care reform strongly advocate managed care (Smith, 1993).

Managed care is designed to provide clients with a single seamless system throughout the wellness-illness-wellness continuum. Continuity of care, prevention of illness, and early intervention are stressed (Himali, 1995). Henry Kaiser is responsible for the first effort at managed care when he conceived the idea of an HMO, Kaiser-Permanente. An HMO assumes a contractual responsibility to provide or ensure the delivery of a stated range of health services in return for a fixed payment with minimal co-payments. This financial arrangement encourages cost-containment. As is implied in the name "Health Maintenance Organization," an HMO's goals are to prevent illness and maintain health by emphasizing lifestyle changes. Preferred Provider Organizations (PPO), another form of managed care, hire specific providers which bill the HMO for care on a fee-for-service basis, but part of the fee is withheld. Incentive for cost-savings is built in by reimbursing the PPO physician if the organization stays within budget (Luft, 1982).

HMO participants receive medical care for 10 to 40% less than enrollees in conventional health insurance plans. This is mostly due to a 30% reduction in hospital admissions. Enrollees in PPOs also have a reduced rate of hospital use. Both plans seem to be able to maintain this reduction in hospitalization without compromising quality of care. However, enrollees of both plans express dissatisfaction with their doctor-client relationship, continuity with the same provider, and with access. However, they are more satisfied with the out-of-pocket expenses than those in conventional health insurance plans (Luft, 1982).

The DOD's program of managed care is called TRICARE and, essentially, offers beneficiaries three options for obtaining health care services. Beneficiaries select from Health Maintenance Organizations (required plan for active duty members), Preferred Provider Organizations, and the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) insurance. The Military Medical Treatment Facilities (MMTF) are reimbursed prospectively; that is, the number of enrollees in the various plans determines their annual budget. This type of capitation budget encourages the MTFs to tailor advertising and services to capture that share of the beneficiary population that represents an effective and efficient use of resources. Product line development is part of the marketing plan and an emphasis on prevention and early detection of illness is incorporated into the provision of primary care services.

Primary Care

Primary care is defined by the Institute of Medicine as the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with clients, and practicing in the context of family and community (Vanselow & Donaldson, 1995). To meet the standards of this definition, certain requirements must be met. These requirements include accessibility, comprehensiveness of services, coordination of services, provision of continuity of care, and

accountability (Estes, 1984). Primary care is a client's first contact in any given episode of illness with the health care system. It leads to a decision about what must be done to resolve the problem and who is responsible for the continuum of care or the maintenance of health, evaluation and management of symptoms, and appropriate referrals (Maraldo, 1993).

Nothing in these definitions requires that primary care be provided solely by physicians. In fact, the Institute of Medicine concluded that no single provider group and no single training sequence could claim exclusive rights to the provision of, or training for, primary care. Also, no single practitioner can provide comprehensive primary care services without the help of others. A key concept is that good primary care services must include the responsibility for establishing a *system* of care (Estes, 1984).

## Theoretical Framework

Health care reform is a test bed for potential solutions to the current crisis. The use of theory and models provides a conceptual framework that aids in discovering solutions to problems. Donabedian (1980) concludes that there are several definitions of quality, but that the essential core is the balance of health benefits with harm. To evaluate quality, he states that the simplest, complete module of care is the management by a practitioner of a definable episode of illness in a given client. Donabedian then divides this management into two domains: technical and interpersonal. He defines technical care as the application of the science and technology of medicine, and of the other health sciences, to the management of a personal health problem. Interpersonal care is the management of the social and psychological interaction between client and practitioner.

To operationalize the measurement of quality, Donabedian proposes that this assessment be categorized into structure, process, and outcome variables. He defines structure as "the relatively stable characteristics of the providers of care, of the tools and resources they have at their disposal, and of the physical and organizational settings in which they work" (Donabedian, 1980, p. 81). Process, the primary object of assessment and the basis for the judgment of quality, is the "set of activities that go on within and between practitioners and clients" (Donabedian, 1980, p. 79) Outcome is "a change in a client's current and future health status that can be attributed to antecedent health care" (Donabedian, 1980, p. 82-83). Within the construct of outcomes, he includes clients' attitudes (satisfaction), health-related knowledge, and health-related behavioral change.

Quality assessment concepts are integral to the design of this study. The assurance of quality health care to beneficiaries remains the ultimate goal of the Army Medical Department (AMEDD). This study utilized Donabedian's model to organize the variables according to

structure, process, and outcome definitions. This framework should assist in describing what is observed and measured, explaining the various relationships, and predicting what will be best for military medical health care.

Structure

Structure indirectly influences the outcomes of care. It consists of the stable characteristics of the providers of care, the resources available, and the organizational setting within which they work (Donabedian, 1980). The structure variables examined in this study include the demographics of the provider, client, and clinic. Their relationship to the provider's practice style and the client's health status and satisfaction is discussed.

Process

The primary object of the study of quality in health care provision is the set of activities that occurs between provider and client known as the process of care (Donabedian, 1980). Due to the large body of literature that exists on technical style, this study did not assess technical style variables, rather it assessed interpersonal style variables which had not been previously investigated in an integrated manner. "Interpersonal style," sometimes referred to as the practice style of the provider, was defined in this study by six provider attributes: practice model, confidence in skills, autonomy, collaboration, information giving, and satisfaction. In addition, a single attribute of the client, one which seemed critical to the interaction of provider and client, was measured: information seeking.

Outcome

Outcomes of care reflect the end result of the client's interaction with primary health care providers. What happens to the client is influenced by many factors such as the primary care setting, provider skill and interactions, and client characteristics. Donabedian (1980) states that the ultimate validators of quality of care are the effectiveness of accomplishing or producing client health and satisfaction. In this study, outcomes were operationally defined as health status and client satisfaction.

Research Questions

1. What is the relationship between provider practice style variables (practice model, confidence in skills, autonomy, collaboration, and information giving) and client outcome variables (client satisfaction, client health status, client functional status)?

a. In what way do provider demographic variables modify the relationship between provider practice style variables and client outcome variables?

b. In what way do client demographic variables and client information seeking modify the relationship between provider practice style variables and client outcome variables?

2. What is the relationship between client information seeking behavior and client outcomes (client satisfaction, client health status, client functional status)?

3. What is the relationship between provider satisfaction and client outcomes (client satisfaction, client health status, client functional status)?

4. What is the relationship between client satisfaction and client health and functional status?

5. What is the relationship between provider demographic variables and provider practice style variables?

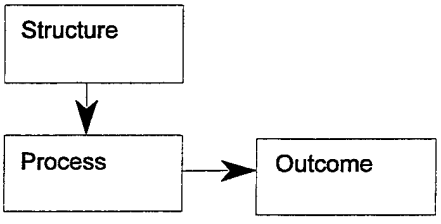
6. What is the relationship between client demographics and client information seeking behavior?

7. What is the relationship between provider demographics and provider information giving behavior?

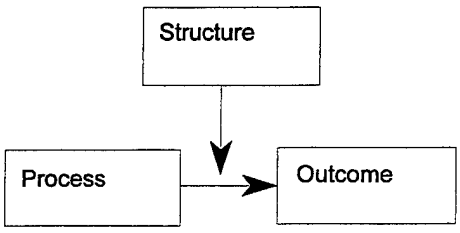
8. What is the relationship between provider type (physician, nurse practitioner, and physician assistant) and client outcomes (client satisfaction, client health status, client functional status)?

9. Do "structure" variables modify "process" variables before "process" variables influence "outcome" variables (Model A) or do "structure" variables modify the way in which "process" variables influence "outcome" variables (Model B)?

Model A




Model B



## Introduction

The purpose of this study was to assess the practice styles of members of multidisciplinary primary care provider teams composed of physicians, nurse practitioners, and physician assistants and how those styles influenced client outcome variables. The existing literature focuses almost exclusively on the technical aspects of care, e.g. diagnostic test ordering, time spent with each patient, treatment methodologies. This study measured the interpersonal aspects of practice style to determine *how* they achieve outcomes in client functional status, health status, and satisfaction.

Despite the myriad of articles about the practice style of specific provider types, there is no distinct literature describing a practice model, per se. There are certain models, like the medical or nursing model, but the studies and writings about them focus on a variety of topics. Therefore, in this chapter, the literature will be broken down into sections as described by Bottom (1987). The history of the profession, educational requirements, practice settings, scope of practice, cost-effectiveness, productivity, quality of care, roles, and current issues are covered for each of the three provider types in this study: physicians, nurse practitioners, and physician assistants.

## Physicians

### History

The healing practice has been around since the arrival of the human race. Throughout history there have been all kinds of healers. Healing has its roots in magic, religion, tribal activities, trial-and-error, and empirical observation.

Medicine was recognized as a profession in the middle ages and as a consulting profession in the late 19$^{th}$ century. Before the middle ages the term "doctor" did not exist. The early healers did not receive university training, but were educated under an apprenticeship program (Freidson, 1971; Duffy, 1976). The early "healers" worked mainly for the elite social classes. Everyday medical work dealt with unscientific practices like bleeding, blistering, purging, vomiting, and sweating that, sometimes, harmed clients (Duffy, 1976). The public was very skeptical about individuals practicing medical work and did not have confidence in medicine as a profession.

The medieval university conferred the title "doctor" which constituted a vague collection of healers practicing at the time. Students attending the medieval university were typically members of the elite social classes. Around this period of time, legislative efforts began to provide stricter regulation of the healing practices.

In the early 19th century in America, it was not possible to have a distinct occupation based on credentials. On the frontier, anyone could be a healer. There were numerous "doctors" during the 19th century who created much public confusion and resulted in a lack of confidence in "doctors." The practice of medicine was not yet scientific.

The American Medical Association (AMA) was organized in 1847. The goals of this organization were to enhance the welfare of physicians and to advance knowledge, making it more useful (King, 1984). Medical information was available in the growing number of medical journals.

Medicine, as we know it today, is strongly tied to scientific knowledge about the cause, prevention, and treatment of disease. The 1860's were critically important for medicine because of the new association of bacteria with disease. Medicine shifted from symptomatic and empirical treatment to preventive and causal treatment (Freidson, 1970 & 1971; Shortt, 1983).

Parallel to the scientific foundation, a social foundation was also being established. Guilds were important to regulate healing practices because of public safety issues. The medical profession stressed the fact that qualified men were doing medical work and this body of qualified men were competent to determine the proper content and methods of performing medical work (for the layman).

In the 20th century, American medicine became more organized and licensing was established, based on uniform standards of medical education (Alpert & Charney, 1973; Shortt, 1983). Since medical education had set criteria, training became uniform. This permitted distinctions to be made among types of "healers." With sound and unique technical and scientific education, the physician did win the confidence and trust of the public and with it gained the exclusive right to practice medicine. This movement firmly established medicine as a consulting profession with the major goal of solving a client's medical problems. State-supported medicine further legitimized the profession. By having state support, medicine also controlled other health care occupations' practices, limiting what they could do by supervising and directing their activities.

Whether all of these characteristics are still core values of the medical profession is debatable. Much has happened in the last decade to create a pervasive turbulence in America's health care system. Early proposals for health care reform identified traditional values as the root cause of mismanagement and inattention to the consumer (Alspach, 1995; Califano, 1994). Reform models required that the practice of medicine become more holistic, equitable, and accountable (Donley, 1993; Himali, 1995; Smith, 1993). Efforts to minimize inpatient care, maximize outpatient care, implement primary care models, and increase the influence of general practitioners were based on professional values that incorporated an active role for the client, the community, and the accountant (Christakis, 1995; Lohr, Vanselow, & Detmer, 1996; Pew Health

Professions Commission, 1994). The success of these programs will be judged over the next decade.

Profile

In 1994, the AMA reported that there were 684,526 practicing physicians in the United States. Women constituted 19.5% (133,263) and men 80.5% (551,263) of the physician workforce. Federal physicians accounted for 22,454 physicians (Randolph, Seidman, & Pasko, 1996).

The ubiquitous interest in national healthcare reform and the soaring growth in health maintenance organizations has fueled a rise in the provision of outpatient services by general practitioners. A new model of healthcare, the "primary care clinic," has been proposed as a direct result (Vanselow & Donaldson, 1995). In a now classic analysis of medicine in the mid-20th century, Friedson (1970 & 1971) outlined the characteristics of the traditional role of medicine in the United States.

(1) A prominent characteristic of 20th century medicine was its *power base.* The field of medicine holds high social value and prestige with the United States public. Medicine was self-regulating and thus able to control the content of its work. Practitioners enjoyed the freedom to practice their work with minimal outside interference or regulation from peers. In addition, medicine directed the activities of other health care occupations.

(2) Another characteristic of medicine was that its members held certain *professional values.* Those values included having specialized scientific knowledge and techniques, independence, medical responsibility, clinical experience, a client relationship based on trust, and a professional network.

(a) To acquire the requisite *knowledge and experience,* physicians went through a prolonged period of training. As a result of this training the physician was able to practice medicine as a consulting profession. That is, one in which a layman freely selects a doctor for expert medical advice and solutions to medical problems. The physician applies an expert knowledge based on the client's problem with the authority granted by technical competence.

(b) Another value key to defining the profession was *independence.* Physicians were taught in medical school to be independent practitioners. There was minimal colleagial regulation of practice.

(c) With independence came the value of *medical responsibility.* This traditional view held the physician responsible for the client's life. Physicians were expected to take personal responsibility for the results of their care.

(d) Medical responsibility put a premium on *clinical experience,* a physician's firsthand contact with clients. Clinical experience was the basis for developing therapeutic

choices for clients with disease. Unfortunately, clinical experience was often substituted for scientifically verified knowledge. The acquisition of clinical experience in medical school taught the value of firsthand knowledge over book knowledge. The disadvantage of this approach was its narrow focus on the physician's own work; evaluation of the world through the filter of personal experiences.

(e) The *physician-client relationship* was a key component of professional values. The layman had to be able to freely choose a physician's services. The physician-client relationship was built on trust, not credentials. The physician was considered more educated than the layman regarding medical matters and had authority over treatment. Traditionally, the physician was distant in this relationship because the physician must be objective to be effective. The physician was taught to view the client from the perspective of symptoms, or organ systems, and not as a person. The client was not expected to assume responsibility for his/her own health.

(f) The last core value was developing and maintaining *professional networks*. This network was the bridge between the structure of medicine and the individual practitioner. The network represented a stable set of colleagues for the practitioner. Physician members of the network shared the same professional standards, participated in each other's work, and controlled the organizations and practices within which they worked. Medical practice was controlled within medicine through a referral system. In this way, physicians were interdependent and able to influence other's work.

Education

Early medical training in the United States was not university based, but run by proprietary schools through apprenticeships. This process turned out a lot of physicians for the frontier, but lacked uniform standards for quality assurance. In 1910, medical schools went through reform because of the Flexner report. This report exposed proprietary schools, allowing medical schools to begin to form ties to university settings. In his report, Flexner, called for full-time faculty instead of part-time general practice physicians. Although this report set the stage for medical training to science-based, it also led to a de-emphasis on generalists (Alpert & Charney, 1973).

There are 124 accredited medical schools in the United States, mostly four year programs (Barzansky, Jonas & Etzel, 1995). In 1994, the number of applicants to all medical schools was 45,365. At this time, the entering class was composed of 17,317 students for an acceptance rate of 38.2% (Barzansky et al., 1995). Once a student is accepted into medical school the attrition rate is low, 1.1% of the total enrollment (Barzansky et al., 1995). The most frequent reason for attrition is academic failure/poor academic standing. To become a physician, the student endures a lengthy educational process. Accepted medical students have completed four years of college

usually with an undergraduate degree in science (Freidson, 1970). Medical school is typically four years of training. The majority of physicians follow medical school immediately with a year-long internship. To specialize in a particular field, the student invests an average of two to six years in a residency program.

Medical school is known for its duration and detail. All medical training has a common foundation of knowledge, skills, values, and attitudes. The curriculum is composed of three basic content areas: basic sciences, evaluative sciences, and clinical skills (Altman, 1995). The basic sciences relate to the biomedical sciences such as gross anatomy, biochemistry, advanced physiology, and the neurosciences. The evaluative sciences include course work in clinical epidemiology, statistics, medical decision-making, medical outcomes, health services research, bioethics, and health promotion. Courses in clinical skills include diagnosis, pharmacotherapeutics, and clerkship.

Medical education has traditionally used a reductionistic approach of teaching which breaks down and analyzes biological problems into a fundamental physical cause. This approach does not view the client holistically, but focuses on a "diseased part" orientation (Altman, 1995; Armentrout, 1993; Cassell, 1995). Reform has been suggested throughout the history of medical education. Advocates of medical school reform believe major changes are needed in the teaching-learning strategies, handling the knowledge explosion, and reformatting the curriculum. A hallmark of medical school is the amount of detail students must incorporate in a four year period. The overwhelming amount of detail relating to content areas is staggering. Petersdorf and Turner (1995) report the required reading for second year students at one medical school totaled 11,000 pages and took students an average of 1,700 hours to complete. Recommended books added over 7,000 pages and faculty handouts another 4,000 pages. The problem with this amount of detail is two-fold. Students are forced to use rote memorization of material and so may not acquire the ability to apply the concepts to a practical situation. The second problem encountered is the difficulty students experience accessing relevant information. Some medical schools are placing greater emphasis on teaching students the skill of searching the medical literature for information pertinent to a clinical problem. This approach emphasizes search skills as a way of handling the knowledge explosion and as a means of staying current in medical practice techniques. Effective handling of information is a critical aspect of medical practice.

Traditionally students have been exposed to the lecture method of teaching in medical school. Advocates of reform are calling for more active ways for students to participate in the learning process and a reduction in the number of lecture hours across the four years of medical school (Barzansky et al., 1995; Boelen, 1995; Christakis, 1995; Petersdorf & Turner 1995).

Some medical schools are responding to the challenge of recommended medical school reform. Petersdorf and Turner (1995) report that some schools have reduced the number of

lecture and scheduled hours. These authors report that one medical school reduced its scheduled hours from 988 hours to 780 hours and the average number of lecture hours from 450 to 370 hours. Some schools have explored using approaches like small group discussion, small group presentations, tutorials, independent study, and computer simulations to enable students to be more active in the learning process. Another goal of these new teaching methods is to encourage self-directed learning. An emphasis is placed on life-long learning instead of the immediate learning associated with medical school.

Another innovation is the use of the computerized client scenario that is either real or simulated. This strategy enables students to experience the same clinical lesson, decreasing the subjectivity in assessing a student's clinical performance.

Another concern is the curriculum in medical school. Advocates believe that the curriculum does not reflect the changes in society. Advocates are in favor of broadening the curriculum to give greater emphasis to a population perspective in health, knowledge of the person, information management, preventive care, communication skills, chronic illness, disability, organizational leadership and management principles, resource management, and outcomes management (Alpert & Charney, 1973; Boelen, 1995; Cassell, 1995; Christakis, 1995; Greenfield et al., 1992; Greenlick, 1995; Petersdorf & Turner, 1995;).

The broadening of the curriculum shifts the emphasis from producing physician specialists to producing generalists. Cassell (1995) states the primary care physician is responsive not only to client needs, but also to community needs. Cassel (1995, p. 399) goes on to say that there is "no adequately developed curricula, nor is there a sufficient cadre of teachers for training the primary care physician."

As the curriculum broadens, so must the clinical settings where medical students practice. Traditionally, medical schools affiliated with hospitals for their training. Medical training is financed through the government and reimbursement is channeled through the number of residents in a hospital. This funding approach continues to support training for specialization for the medical student. Training in an outpatient setting is viewed as supplemental to hospital training. The current emphasis is to increase clinical teaching in ambulatory and managed care settings so that students can see the full range of client problems (Christakis, 1995; Petersdorf & Turner, 1995).

A study by Finocchio, Bailiff, Grant, and O'Neil (1995) gave some insight as to what practicing physicians feel are important content areas for future physicians. They conducted a survey regarding physician attitudes toward 16 competencies deemed essential to practice medicine today. The sample consisted of 300 physicians (a response rate of 33%). Seventy-five percent of the respondents felt that 12 of the 16 competencies were very important for undergraduate training. Two out of three respondents felt it was very important to include client and family in decision-making. Over one-half of the respondents felt their undergraduate training

was poor in this aspect of involving client and family in decision-making. Cost implications and the use of complex technology were viewed as very important and many of the respondents indicated their programs did not address these areas. Two-thirds of respondents felt insufficiently prepared to understand the role that community agencies play in healthcare. The majority of respondents felt it was not important to teach clients. In spite of recent trends in healthcare, in this 1995 survey only one in seven respondents felt training in a managed care setting was very important.

Medical school reform is also targeted to address physician workforce issues based on the needs of society. These issues center around the problem of too few generalists in practice now; too few medical students wanting to become generalists; too few minority medical students to reflect the ethnic composition of the U.S.; inequality in the geographic distribution of physicians; and too many physicians (Christakis, 1995; Council on Graduate Medical Education, 1992; Lohr et al., 1996; Pew Health Professions Commission, 1994). To combat the problem associated with physician workforce issues, the Institute of Medicine (IOM) (Lohr et al., 1996) recommended that no new schools of allopathic or osteopathic medicine be opened, class size in existing medical schools not be increased, and no public funds be available to develop new schools or increase class size. The IOM also recommended that the government limit the number of international graduate medical education positions in hospitals.

The Pew Health Professions Commissions (1994) recommended an increase in the number of medical students entering generalist training by restructuring federal and state financing methods, creating incentives for students entering primary care medicine, expanding clinical settings in ambulatory, rural and community settings, retraining specialists to become generalists, and hiring and rewarding primary care faculty. The Commission also recommends establishing more nurse practitioner and physician assistant programs, increasing the number of practicing nurse practitioners and physician assistants, and removing the barriers that these non-physician practitioners face in practicing primary care.

The last area of medical school reform focuses on medical school responsiveness to society (Boelen, 1995; Christakis, 1995; Greenfield et al., 1992; Petersdorf & Turner, 1995). The educational mission should be tied to the health needs of the communities served. Medicine is dependent on society and failure to make an effort to understand and respond to community needs "violates the basic covenant between physicians and people they have obligated themselves to serve" (Christakis, 1995, p. 77).

Medical schools' service to society reassures the public that the profession warrants their trust and that the profession will regulate itself. Society can exert pressure on medical schools by stressing what health problems should receive high priority, appropriate use of technology, appropriate use of resources, and improved access to medical care for all citizens. Since

taxpayers financially support medical schools, schools need to focus on meeting public health needs.

In order to meet client needs, it is important for the physician to have a better understanding of the client. The physician needs to visualize the client as an integral part of a family and community. Clients are concerned about quality, comprehensive and continuous care, and acquiring knowledge for themselves. Clients also want to participate in decisions about their health problem (Leopold, Cooper, & Clancy, 1996; Ong, Dehaes, Hoos, & Lammes, 1995; Roter & Hall, 1993).

Medical schools also have a social accountability to society as well as responsibility. Medical education, medical research, service delivery, and health care organizations in the community should be evaluated to determine whether they reflect society's needs (Boelen, 1995; Petersdorf & Turner, 1995). Medical schools should consistently evaluate their teaching models to ensure they are current and best serve medical practitioners in meeting society's health needs.

Practice Settings

Physicians practice in either a private setting or within an organization (Duffy, 1976; Freidson, 1971). Private practice consists of solo, group practice, and partnerships. In the classic or traditional "solo private practice", the physician works by himself. Medicine is practiced in privacy and provided to one client at a time. The theme of private solo practice is independence to practice as one chooses. In order to establish a solo practice, the physician contributes self obtained funds. This type of practice is "client controlled." The physician relies on clients for business. The client freely chooses the physician and, once chosen, the physician assumes responsibility for the client's health problem. In order to keep this client, the physician must please him/her. The fee-for-service payment system does not ensure a long term contract with the client. The physician is not evaluated by standards but by "good faith." The physician in solo practice is isolated from other physician colleagues. Other colleagues are viewed as competitors, so there is minimal exchange of information or advice among colleagues. In solo practice, physician colleagues exert very little control over the solo practitioner. As a result, the quality of care associated with solo practitioners has been questioned (Califano, 1994; Christakis, 1995; Duffy, 1976; Freidson, 1971).

In the purest sense, a "private group practice" or "group association" is a formal arrangement where several physicians share the expense of maintaining a facility, but each has his/her own clients. This type of practice is "colleague controlled" because clients are referred to members within the group. The physician is not in isolation from other physician colleagues and each physician observes the behaviors and actions of others. Colleagues develop standards which are accepted by the group and assessed by the members of the group. These standards

are not universal and vary for each group practice. A shared on-call system allows a group physician to cover for other group physicians on holidays, weekends, and vacations so each physician in the group has some leisure time.

A "private group partnership" is defined by a legally binding contract among two or more physicians. The profits from fees and overhead expenses are shared. Partnerships are more reliable sources of long term financial security. When specialties are involved, the different specialists refer clients to other partners and this method provides a larger number of clients. This type of practice is considered colleague controlled because physicians practice with other physicians.

"Organizational medicine" is defined as a bureaucratic system. The arrangements are very formal and a large number of physicians practice together. Examples of bureaucratic systems include: health maintenance organizations, universities, military treatment facilities, and government settings. There is easy access to diagnostic and therapeutic facilities. It is also easy to refer clients within the system, allowing more comprehensive communication with, and tracking of, the client. The physician is not isolated from peers and it is easier for physicians to keep abreast of the latest information and technologies. There is frequent consultation within the physician network and peers exchange information. There is some systematic, but loose, supervision of physicians by department heads, but norms are controlled by physician colleagues. The physician position in an organization is usually salaried with stable benefits and security.

Scope of Practice

Medicine's roots lie in the client's desire for specific help for a health problem. The client then selects a physician for consultation. The nature of medical practice is determined by the physician's relationship to colleagues, institutions, and clients, and the medical profession's relationship with the state (Boelan, 1995; Cassell, 1995; Christakis, 1995; Eisenberg, 1986; Friedson, 1966; Freidson, 1986). Medicine's system of licensing governs the right to hospitalize clients, prescribe drugs and laboratory tests, and perform procedures. The medical profession controls the content of its work through the medical credentialling process.

Cost Effectiveness/Productivity

Physicians' income grew 24% from 1982 through 1989 (Pope & Schneider, 1992). The average income in 1982 was $125,500 and rose to $155,800 in 1989. Specialists' income, (e.g., surgeons), grew in the range of 31% - 33% while generalists' income gained only 5%. Surgeons averaged $220,500, while generalists made $95,900 a year (Pope & Schneider, 1992). These researchers state that physicians remain the most highly compensated profession with an income gain exceeding any other profession. They found that certain factors contributed to the income

gain. Provisions for more services accounted for 42% and higher profit per service accounted for 58% of the gain. Factors that did not account for the gain included work effort, an increase in clientele, demographic factors of age, gender, or foreign medical graduate, and specialty mix.

Reinhardt (1975) stated that since World War II, physicians' productivity has been high. Hurdle and Pope (1989) studied physician gender and productivity. Productivity was measured by the number of client visits and the revenue generated. These researchers found that female physicians were less productive when visits were measured, but there were no significant differences in gender when examining revenues. The fee-for-service payment system increased productivity because physicians' income was directly tied to physician productivity.

The utilization and practice pattern literature revealed that physicians were not always found to be cost-effective in their practices. Physician practice patterns vary widely across the nation. Also, there is little consensus on treatment decisions. Cave's (1995) study used a diagnostic episode cluster to profile physician practice patterns. Medical claims were analyzed from a preferred practice organization (PPO) and a HMO. All physician practice patterns varied depending on the client's severity of illness and morbid disease, and the physician's age. The greater the client's severity of illness, the more resources the physician in the PPO and HMO used. The style of medical practice in the HMO was less hospital intensive and less expensive than the PPO provider style.

Mort, Edwards, Emmons, Convery, and Blumenthal (1996) presented clinical scenarios to a sample of 1,182 non-federal physicians who were randomly assigned primary care scenarios. The difference among scenarios was the client's insurance status. Physicians that had insured client scenarios recommended services for 72% of clients, while physicians that had uninsured client scenarios recommended the same services for 67% of clients. Further results indicated that physicians recommended discretionary (lack of consensus for treatment) and non-discretionary (agreement on treatment) services more often to insured clients. The researchers suggested that when physicians were uncertain of the need for, or benefit of, services, insurance coverage may have been taken into account in the decision-making process.

Wennberg (1984) attributes physician practice style variation to an uncertainty of how to approach a particular medical problem. Uncertainty can be related to ambiguity in defining the difference between normal and abnormal, characterizing disease entities, collecting accurate data, unavailable data, evaluating diagnostic tests, and measuring clients outcomes (Eddy, 1984).

Fuchs' (1978) study revealed that the supply of surgeons increased the demand for operations. An increase in the number of operations performed increased the cost of the operation. The supply of surgeons was unrelated to the demand, but related to the attractiveness of the location as a place to live. Problems encountered with this study included a small sample size, possible selection bias because the sample came from an urban area, and the small number

of specialties (four) represented. The client mix was not reported by the researchers, nor did they provide an overall estimate of the annual cost per capita of the health benefit.

Johnson, Freeborn, and McCally (1985) examined variations in primary care physicians' use of laboratory, radiology, drugs, and hospital admissions. Included in the survey were 67 physicians from one HMO. Results of this study indicated a wide variation in utilization rates.

Eisenberg and Nicklin (1981) studied medical service usage during a 38 month period. The sample consisted of 336 physicians. This study found that internists and family physicians ordered more laboratory tests and x-rays than general practitioners. Recent graduates ordered more tests than those with more experience.

Kravitz and Greenfield (1995) studied resource use between medical specialties and systems of care in the Medical Outcomes Study (MOS). The MOS was a large longitudinal study that compared a variety of resource utilization and outcome dimensions among clients of five specialties (family physicians, internists, endocrinologists, cardiologists, mental health specialists, and 12 nurse practitioners). The MOS had three study sites: Boston, Chicago, and Los Angeles. The sample consisted of 362 physicians and 2,000 clients. Clients were followed for two years. Solo practices, group practices, an HMO, and a large multi-specialty group practice were examined. Payment systems were either capitated or fee-for-service. This study indicated that sub-specialty care, solo practice, and fee-for-service payment mechanisms were associated with greater use of medical resources. Primary care, group practice, and prepaid care were associated with less utilization of medical resources. This study lends support to the idea that there are few rules or regulations governing the practice of medicine.

Eisenberg (1986) reported regional variations related to surgical rates, hospitalization rates, and variations among inter-regional hospitals and individual physicians. Physician practice pattern variations were attributed to: supply breeding demand, self-interest, style of practice, physician characteristics such as age, specialty, gender, experience, and type of training, practice setting, and clinical leadership.

Quality of Care

Research studies comparing the quality of care among physicians are not widely reported. One reason for this is the difficulty in defining quality of care. It is a very broad and vague term plagued with measurement problems. The other problem is that traditional physician care has been viewed as the gold standard with which to judge non-physician care. Based on comparative studies, all three provider types (physicians, nurse practitioners, and physician assistants) provide quality care (Bibb, 1982; Goldberg & Jolly, 1980; Hill, Bird, Harmer, Wright, & Lawton, 1994; Langner & Hutelmyer, 1995; Lewis & Resnik, 1967; Office of Technology Assessment, 1986; Ramsay, McKenzie, & Fish, 1982; Runyan, 1975; Spitzer, et al., 1974).

An aspect of providing quality care is physician decision-making. Physician decision-making is important because client outcomes are affected. Physician decision-making is very individual and there is great variability in the decision-making process (Anderson & Shields, 1982; Eddy, 1984 & 1990; Wennberg, 1984). The traditional view is that the quality of medical care will remain high as long as the individual physician takes ultimate responsibility for services rendered. The quality of care will also remain high as long as the number of client visits are not increased in practices (Reinhardt, 1975).

Poses, Cebul, Collins, and Fager (1985) studied ten physician-client groups. All physicians in this study were experienced practitioners. All clients had sore throats. The study indicated that physicians made inaccurate probability estimates. Physicians overestimated the probability of a positive culture for 81% of their clients. The physician's probability estimates were strongly linked to treatment decisions and to the prescription of antibiotics (for over one-third of the clients). Poses, Cebul, and Centor (1988) recommended that physicians use probability methods which make clinical judgments quantitative, instead of using subjective estimates of disease probabilities.

Salem-Schatz, Avorn, and Soumerai (1990) surveyed and tested physicians' clinical knowledge regarding blood products. The sample consisted of 122 physicians who were general surgeons, anesthesiologists, orthopedic surgeons, and residents. The study found widespread deficiencies in the physicians' knowledge of transfusion risks and indications. Transfusion risks were estimated correctly by fewer than half of the physicians surveyed. Only 31% of the physicians correctly answered a set of four questions about transfusion indications. It is interesting to note that physicians who had the least knowledge had the greatest confidence in their knowledge. Attending physicians had lower transfusion knowledge scores than residents, yet exhibited more confidence in their knowledge. Of the residents surveyed, 61% said they had ordered transfusions at least monthly that they judged to be unnecessary because a more senior physician suggested a transfusion be given. Forty-four percent of the respondents were unaware of guidelines established by blood banks or administrators regarding the ordering and transfusing of blood. Seventy percent of physicians were unaffected by the guidelines.

The Hawaii Medical Association study (Payne & Lyons, 1975) examined whether physicians' stated standards of medical care reflected their recorded practice. Seven diagnostic categories were represented in this study. Non-military physicians that practiced primary care in Hawaii were included in the study. The sample consisted of 93 physicians including internists, pediatricians, and obstetric/gynecologists. Data collectors reviewed medical records using evaluation criteria that were established by a panel of physicians. Physicians did not meet the accepted evaluative criteria because their writing and documentation were so poor. On average, physicians scored only 40.8% on the evaluation. Board certification was not highly correlated with

evaluation scores. The younger physicians (who had been in practice less than twenty years) had somewhat better performance scores than older ones.

Hulka et al. (1979) did a follow-up study to the Hawaii study and examined physician adherence to explicit criteria when making medical judgments. The sample consisted of 31 physicians (105 physicians refused to participate in the study). Practicing internists in the study were inconsistent in following the consensus criteria. Adherence scores ranged from 0.54 to 0.69. There was an inverse relationship among physicians' workload and adherence to criteria.

Redelmeier and Shafir (1995) examined medical decision-making in situations that had multiple alternatives. These researchers mailed clinical scenarios to 287 family physicians, 352 neurologists and neurosurgeons, and 41 legislators. The results indicated that having three options, rather than only two, increased decision difficulties in all groups of physicians. The third option frequently caused physicians to choose the default option. The uncertainty in deciding between two similar medications led some physicians to avoid the decision. The researchers suggested that physicians do not always resolve decisions in terms of risks and benefits, but resort to intuitive judgments leading to a cognitive bias. Redelmeier and Shafir's (1995) review of the literature suggested that physicians are inconsistent in their medical decision-making. Medical decision-making may be at risk for error due to the urgency, complexity, and uncertainty related to the clinical situation, or to the potential financial cost of the decision (e.g., litigation). Errors can result in compromised client outcomes. The authors suggested that the first step in improving decision-making skills is to recognize that predictable errors do occur.

Leape (1990) supports the use of guidelines and standards for medical practice because poor decision-making can result in unnecessary or inappropriate care and contributes to escalating health care costs. The author goes on to say that a factor in practice variation is a lack of medical profession consensus regarding the appropriate indications for many forms of treatment, thus leading to medical uncertainty.

Roles

Traditionally, physicians have viewed clients from a physiological/biological perspective (Armentrout, 1993; Cassell, 1995). The analysis of a health problem was centered on a diseased body part or organ system. The client chose the physician to do something about a health problem. Thus, both the physician and the client were focused on curing the problem. In this traditional role, physicians must have a superficial relationship with clients in order to remain objective and effective. Eisenberg (1986) calls the physician the clients' clinical agent. The physician is supposed to act in the client's best interest. This responsibility should always be foremost in the physician's mind. As the clinical agent, the physician assures quality care and that the service recommended is necessary for the client's health.

In contrast to this traditional role is the role of the physician as generalist. Kimball and Young (1994) state that a physician who is a generalist provides continuous, coordinated, and comprehensive care to a population regardless of gender, disease, or organ system. The generalist provides primary care services and, thus, needs a broad knowledge base that has a bio-psychosocial approach (Altman, 1995; Friedman, 1995; Kimball & Young, 1994). This approach requires the physician to view the client more holistically.

An emerging role for physicians is that of corporate physician. Mitka (1991) suggests that the corporate physician is an employee in a bureaucracy. Health care reform encourages group practice instead of solo practice. Mitka (1991) reports that 68% of physicians were self-employed in 1990, while 73% were self-employed in 1987. Factors drawing the physician into the corporate world are a guaranteed salary, known benefit package, security, and opportunity for managed care contracts. Rivo, Mays, Katzoff, and Kindig (1995) show a continuing rate of growth of managed care. The total enrollment for HMO's has more than tripled in the last decade to an estimated 56 million members in 1995. Continued growth will require that a greater percentage of physicians be employed in these settings.

Issues

A major issue facing medicine is a dilution of the physician's authority. Physicians have historically been the dominant force in health care. Nearly all work done by other professionals are subject to physician orders or referrals. Only the medical profession was allowed to diagnose illness and direct treatment, and, therefore it directed the services of others. However, as a result of health care reform, other health professionals are gaining autonomy (Pew Health Professions Commission, 1994); clients are choosing to be more active in decisions about their health problems; the federal government is involved in trying to reduce healthcare costs; and traditional physician practice patterns are being questioned.

Another issue being addressed is work force reform. Work force issues include the following: an oversupply of physicians in the United States, a shortage of minority physicians, a shortage of generalists, geographic inequities in access to health care, and maintenance of the physician-population ratio at its current level (Council on Graduate Medical Education, 1992; Lohr et al., 1996; Mullan, Rivo, & Politzer, 1993; Pew Health Professions Commission, 1994; Task Force on the Generalist Physician, 1982). Lohr et al. (1996) stated that the oversupply of physicians in the United States poses more problems than solutions to the nation's health care issues. The oversupply of physicians has not relieved the shortage of generalists, but has boosted the growing number of specialists. The United States has more specialists than generalists in medical practice. No more than 30% of physicians are generalists (Task Force on the Generalist Physician, 1982). As recently as 1994 (Pew Health Professions Commission), the

prediction was that under-representation of generalists was not likely to change in the near future, because medical students continue to specialize and sub-specialize, with a declining interest in generalism. Specialization and sub-specialization are driving up health care costs and contributing to fragmentation in health services. However, expanding managed care and universal access increases the demand for generalists. Several groups have recommended a physician workforce mix of 50% generalists and 50% specialists in the United States (Council on Graduate Medical Education, 1992; Pew Health Professions Commission, 1994). However, no timeline for the accomplishment of this plan was designed.

The last issue is the practice of defensive medicine. Defensive medicine is practiced because physicians are concerned about liability for malpractice (Garg, Gliebe, & Elkhatib, 1978). Positive defensive medicine occurs when a physician performs unnecessary tests due to fear of a lawsuit. This type of defensive medicine is more common than negative defensive practice. Negative defensive medicine occurs when a physician withholds a potentially beneficial treatment because of a high risk of liability. It is unknown how many physicians practice defensive medicine, but increased health care costs is one result of this practice. Hirsh and Dickey (1983) stated that defensive medicine is practiced and its existence is acknowledged by practicing physicians.

Rapid changes in the health care arena are forcing physicians to examine their views and practice patterns. Several sectors of the public are closely monitoring physician activities in health care and are recommending reform. In the past, medicine has responded very slowly to reform; the future will determine whether external forces to medicine will mandate change.

Major Findings

Medicine's roots lie in the client's desire for help related to a health problem (Eisenberg, 1986). A client's choice of a particular physician is changing due to health care reform and managed care (Rivo et al., 1995). When examining the physician-client interaction, the physician traditionally viewed clients from a physiological/biological perspective. This perspective allowed the physician to focus on health problems as a "diseased part" and producing a specific cure (Altman, 1995; Armentrout, 1993; Cassell, 1995). The current emphasis is understanding clients holistically, viewing them as an integral part of a family and community, with a variety of needs that go beyond the physical nature of their health problem (Leopold et al., 1996; Ong et al., 1995; Roter & Hall, 1993).

There is support in the literature that physicians are not cost-effective (Califano, 1994; Cintron, Bigas, Linares, Aranda, & Hernandez, 1983; Eisenberg & Nicklin, 1981; Fuchs, 1978; Kravitz & Greenfield, 1995; Mort et al., 1996; OTA, 1986; Pope & Schneider, 1992). Reasons for

this include practice pattern variations, little consensus on treatment decisions, and malpractice issues (Cave, 1995; Fuchs, 1978; Kravitz & Greenfield, 1995; Mort et al., 1996; Wennberg, 1984).

Major Limitations

The studies reviewed had similar limitations. One limitation related to representiveness of the sample. Over 50% of the studies utilized one study site (Fuchs, 1978; Johnson et al., 1985; Pope & Schneider, 1992; Poses et al., 1985; Salem-Schatz et al., 1990; . Having the sample come from one study site reduces the ability to generalize the findings. Another problem encountered with sample selection is selecting only a few specialties of medicine and generalizing to the population of physicians. This occurred in over 50% of the studies (Eisenberg & Nicklin, 1981; Mort et al., 1996; Poses et al., 1985; Redelmeier & Shafir, 1995; Salem-Schatz et al., 1990).

Another general limitation encountered in the studies on practice patterns is that four out of five researchers did not control for the severity of illness or comorbid conditions of clients. It is difficult to cost out services if severity of illness is not controlled (Cave, 1995; Fuchs, 1978; Johnson et al., 1985; Mort et al., 1996).

## Nurse Practitioners

History

Deep within the roots of nursing, as early as the colonial period, nurses held expanded roles as autonomous healers, early settlement nurses, public health nurses, clinic nurses, and midwives (Bullough, 1995, Inglis & Kjervick, 1993). A goal for these early autonomous practitioners was to provide quality health care to people that otherwise would not have any health care at all. It was difficult for early settlers to obtain medical care because of the extent of what was known about disease and a shortage of providers.

The formalized concept of the nurse practitioner occurred in 1965. The turbulent 1960s were characterized by social change with an emphasis on health care as a right for all. The public demanded access to all levels of health care, engaged in early consumer activism, and perceived a shortage of primary care physicians. This perceived shortage of primary care physicians was due to the limited number of students and the specialization and sub-specialization of physicians. All of these factors facilitated opportunities to create a new health care practitioner - the nurse practitioner (NP).

Profile

In the early 1960s and 1970s, nurse practitioners practiced in pediatric and family health. By 1980, nurse practitioners specialized in other practice areas such as adult health, geriatrics,

occupational health, women's health, and psychiatric/mental health. This differentiation and broadening scope points to career paths for advanced nursing practice roles (Freund, 1993).

In 1994, there were 2.2 million registered nurses (RN) in the United States. Of the 2.2 million, 100,000 RNs practiced as nurse anesthetists, certified nurse midwives, clinical nurse specialists, and nurse practitioners (Schaffner, Ludwig- Beymer, & Wiggins, 1995). Nurse practitioners accounted for over 50,000 of these advanced nurse practitioners [Nurse Practitioner Associates for Continuing Education (personal communication), June 10, 1997].

According to Pan, Geller, Gullicks, Muus, and Larson (1997), nurse practitioners have the following characteristics: female (96%); 35-44 years old (51%); married (70%); Caucasian (94%); post-baccalaureate prepared (51%); practice in a metropolitan area (86%); practice in states with prescriptive authority (97%); employed in ambulatory practice (91%); have more than six years experience as a NP (65%); work full-time (73%); and work an average of 41 hours per week.

Education

The first nurse practitioner program started in 1965 in the Colorado Pediatric Nurse Practitioner and Associates program directed by Henry Silver, MD and Loretta Ford, RN, Ed.D., FAAN. This four-month program was jointly developed by the Department of Pediatrics of the School of Medicine and the School of Nursing of the University of Colorado. This program was initiated as a demonstration continuing education program rather than a graduate program. This program prepared nurses for an expanded role in providing total health care to children in private physician offices or in areas with inadequate health care (Silver, Ford, & Day, 1968). The nurse practitioner program was based on a nursing model that highlighted health promotion, the growth and development of children in families, and the prevention of disease and disability (McGivern, 1993). The directors of this program made it clear that nurse practitioners were not independent health care practitioners, but were under the supervision of the physician (Silver et al., 1968).

Physicians voiced very little resistance to the early nurse practitioner movement. The nurse practitioner movement was viewed by physicians as a controlled method of increasing physician profits (Inglis & Kjervick, 1993). The major opposition to the nurse practitioner movement came from nursing education. The major road block was a philosophical conflict centered around the role of medicine in nursing; the conflict was not resolved until the mid 1980s (Fenton & Brykczynski, 1993).

Due to the opposition of nursing education to the nurse practitioner role, there was fragmentation and disorganization of the early nurse practitioner programs. Most of the early nurse practitioner programs were affiliated with medical schools and classes were taught by physicians. If a nurse practitioner program existed in a nursing school, it was a continuing

education program, not a formal course. As a result there was great variability in the content and quality of these early programs (Fenton & Brykczynski, 1993).

The early nurse practitioner programs were non-degree programs lasting four months to one year. At the completion of the program, the nurse practitioner was awarded a certificate. Many of these early programs received federal funding to meet the demand for primary care services. Early nurse practitioner program graduates were pediatric and family nurse practitioners. By 1980, nurse practitioners had further specialized into adult, geriatric, occupational health, women's health, and psychiatric/mental health. Since the mid 1970s, the certificate nurse practitioner programs were replaced by graduate programs leading to a masters degree in nursing. The American Nurses Association formally defined this advanced nursing practice role and established guidelines for practice (Freund, 1993).

As the nurse practitioner movement gained acceptance, a perceived physician oversupply existed and anti-nurse practitioner sentiments were initiated by the American Medical Association and the American College of Physicians (McGrath, 1990). These feelings about nurse practitioners filtered down to practicing physicians. The result was an unwillingness of physicians to delegate tasks to the nurse practitioners in a shrinking marketplace. Physicians started lobbying their state legislators to define the roles and set limits of nurse practitioners (NPs) (McGrath, 1990).

In 1982, through the support of the Robert Wood Johnson Foundation, the National Task Force on Family Nurse Practitioner Curriculum and Evaluation developed guidelines to account for role development and change in nurse practitioner practice. This effort helped nurse practitioner programs to focus and organize. The second curricular innovation occurred in 1988. The National Organization of Nurse Practitioners Faculties appointed an Ad Hoc Education Committee (AHEC). This committee reviewed existing nurse practitioner education curricula and developed national guidelines. The AHEC work, which was based on extensive research, developed new competencies for nurse practitioner graduates (Price et al., 1992).

The new nurse practitioner would have competencies in primary health care theory and research within Brykczynski's (1989) five domains. These domains include management of client health/illness status in ambulatory care settings, monitoring and ensuring the quality of health care practices, organizational and work role competencies, the helping role, and teaching-coaching function (Brykczynski, 1989; Price et al., 1992). This curricular framework retains the priority of nursing care which is a holistic view (incorporating the physical, emotional, psychological, cultural, and spiritual needs) of client management from the perspective of wellness, illness, prevention, and maintenance of optimal health (Price et al., 1992). Current nurse practitioner programs incorporate a theoretical and research base to a particular practice area, a broad scope not

focusing on a body system or disease, interdisciplinary sensitivity, and a strong clinical base with at least four years in clinical nursing.

Another strength to nurse practitioner education is national certification. National certification for nurse practitioners was established in the mid 1970s by several nursing organizations such as the National Certification Board of Pediatric Nurse Practitioners, American Nurses Association, the National Certification Corporation for Obstetric/Gynecologic, and Neonatal Nursing Specialties. In a national survey conducted by the Washington Consulting Group (1994) an estimated 56% of the nurse practitioners were educated in certificate programs and 44% in masters programs. An estimated 24,695 nurse practitioners hold national certification and are recognized by the states.

Practice Settings

Nurse practitioners practice in a variety of settings such as rural clinics, physician offices, schools/universities, health departments, hospitals, industry/business, jails, nursing homes, and home health agencies (Freund, 1993). Pan et al. (1997) indicated that 91% of NPs practiced in ambulatory care settings, 7% practiced in an inpatient setting, and 2% practiced in other settings. A national survey conducted by the Washington Consulting Group (1994) and Physician Payment Review Commission (1994b) indicated that 29% of practicing nurse practitioners work in private practice with physicians or in health maintenance organizations; 23% work in hospital outpatient departments; 23% work in public health/community health centers; 11% work in inpatient hospital settings; and the remaining 14% work in solo practice.

Scope of Practice

Nurse practitioners must be able to assess a wide range of actual or potential health problems, interpret data and formulate an informed opinion by contrasting individual characteristics with knowledge from physical, psychological, emotional, spiritual, and cultural factors, initiate a comprehensive plan of care that focuses on health promotion, treatment, guidance, counseling, education, and referral, and coordinate comprehensive care (McGivern, 1993). A holistic approach to clients, health promotion, guidance, counseling, teaching, and referral are traditional nursing functions. In addition to the traditional nursing functions, NPs carry out functions traditionally performed by a physician, such as diagnosis, ordering laboratory and diagnostic tests, developing and implementing a treatment plan, and prescribing medications.

States have significant influence over NP practice because of public safety. The states restrict practice to health care providers that have satisfied licensing requirement. NPs are regulated by each state's Board of Nursing and the State Practice Acts. All the states have legally acknowledged, in varying degrees, the expanded roles of advanced nurse practitioners, such as

clinical nurse specialists, certified nurse midwives, certified registered nurse anesthetists, and adult, family, or pediatric nurse practitioners.

Practice environments in the 50 states were examined in a study by Sekscenski, Sansom, Bazell, Salmon, and Mullan (1994). The methodology included reviewing journal articles and using a scoring system for analysis. These researchers found a wide variation in the regulation of nurse practitioners and physician assistants. Favorable state practice environments such as those states which allowed prescription authority and reimbursement for services, encourage professional collaboration, and engendered acceptance by the public were strongly associated with a greater supply of NPs, physician assistants (PAs), and certified nurse midwives (CNMs). Less favorable state practice environments were associated with fewer practicing NPs, PAs, and CNMs.

In most situations, NPs collaborate with physicians; they practice under the guidance of a physician. NPs recognize their scope of practice and limitations which enhances collaboration. A NP consults with a physician when the client's condition warrants treatment beyond the NPs expertise (Reed & Selleck, 1996).

Productivity/Cost-Effectiveness

Since the 1970s, a considerable amount of research has been generated on non-physician productivity and cost effectiveness.

When examining studies surrounding economic impact of NPs, the reader must review four categories. These four categories are productivity, profitability, cost of care, and outcomes. Within each of these categories there are certain interpretation problems that relate to research design and measurement which can bias results.

Productivity. Productivity measures the NPs contribution to the output of a setting. A common way to measure productivity is the number of NP client visits relative to physician output. This approach fails to examine the qualitative aspects of NP contributions like health promotion, teaching, and counseling. Another problem encountered with productivity studies is the short experience history of NPs. Most samples include NPs in practice less than two years. Very few studies examine productivity of experienced NPs and productivity between the experienced and less experienced could differ.

In Freund and Overstreet's (1981) review, it was reported that NP productivity ranges from 12%-79% relative to physicians. They emphasize this variability in productivity is due to the type of practice setting such as private practice, a HMO, or a government agency, the practice history of the NP, such as the length of time in practice, the roles and utilization patterns of NPs, how productivity is measured, such as the number of client visits/day, the number of client

visits/week, the number of client visits/month, and NP autonomy. The authors reported that of all these factors contribute to productivity variability, practice history, and autonomy.

Spitzer et al., (1974) in the Burlington randomized NP trial followed families in a primary care setting. This longitudinal study had a sample of two NPs, two physicians, two study sites, and a total of 1,598 families receiving care. The results of this study indicated that the NPs were safe and effectively managed 67% of their client visits without physician consultation. The client sample was adequate, but the provider sample of physicians and NPs was small.

Spector, McGrath, Alpert, Cohen, and Aikens (1975) examined productivity, quality of care, and cost-effectiveness. Four NPs saw selected clients with chronic conditions. The NPs were recent graduates from a NP school and had been in practice less than a year. The results of the study indicated NPs could adequately handle 98% of the recurring problems (defined by referring physicians) and 85% of the new problems that the NPs discovered. During the study period, scheduled and unscheduled visits to the physician clinic decreased and the cost of health care per client in the NP group increased because of more follow-up visits.

Holmes, Livingston, and Mills' (1976) observational study compared the productivity of two solo primary care practices. One practice had a physician and the other practice had a physician and a NP. Results of this study indicated the NP was seeing 1,848 visits/year. The NP increased visits by 31% during a standard day over the solo physician practice. The NP managed the client visits independently and handled most of the client phone calls.

A second study by Holmes, Livingston, Bassett, and Mills (1977) measured productivity by using a relative value scale and equivalent dollar values assigned to services and the traditional measure of number of visits. In this observational study, the researchers examined four practices that had physician-NP teams or physician-office nurse teams. The observational data were collected over six periods of time of nine to 15 consecutive workdays. The study results indicated that the physician-NP teams were 6% more productive than physician-office nurse teams when measured by the number of client visits. However, when the unit of measurement for productivity was the relative value of services, the physician-NP team was 26% more productive. NPs who were the most independent were also the most productive. When comparing the NPs and the office nurses' productivity, NPs were the most productive and generated more relative value in shared visits for history taking, physical assessments, charting, educational activities, and testing.

Zammuto, Turner, Miller, Shannon, and Christian (1979) examined NP utilization with 143 NPs in 61 clinical settings. The findings revealed that in physician intensive settings, NPs were less effectively utilized, where the opposite was true in settings with few physicians.

The OTA (1986) conducted a landmark survey examining NPs', PAs', and CNMs' practice patterns. This study reported 50% to 90% of activities performed by physicians could be

delegated to NPs. The researchers found NP productivity was affected by how willing the employers, like physicians and organizations, were delegating tasks. In this study the practice setting influenced NP productivity. The greatest amount of NP productivity occurred in larger settings like universities and HMOs.

Profitability. Profitability reflects the NPs' ability to generate income or exceed expenses incurred by their employment. Profitability is an important factor when considering utilization. Caution is needed when interpreting profit studies because of how it is measured. There is a variety of formulas to measure revenues and expenses. A major influencing factor related to NP profitability is third party reimbursement. Restrictive reimbursement policies prohibit coverage of many nurse practitioner services. If nurse practitioner services were reimbursed for their services, NPs could generate at least twice their salaries and benefits (Freund, 1993).

Cost of care. Many of the cost of care studies compared cost associated with NP care and physician care. Cost of care can be defined in terms of cost per visit, cost per hour, and cost per episode of care. Cost of care on a per visit basis provided by an NP ranges from 20% to 40% less than physician care. Cost of care on a cost per year basis provided by a NP ranges from 4% to 23% less than physician care (Freund, 1993).

Brodie, Bancroft, Rowell, and Wolf (1982) conducted a retrospective chart review of 395 clients. Each client had seen a physician and a NP during the three-month study period. Results revealed that pediatric NP care in a military ambulatory care setting was less expensive than physician care. The results of this study indicated that NP care costs were 39% lower than physician care.

Salkever, Skinner, Steinwachs, and Katz (1982) compared the cost-effectiveness of NPs and physicians related to otitis media and sore throat. The sample included four physicians and four nurse practitioners in this observational design. In this study, cost was defined in terms of episodes of care associated with provider time input and cost of ancillary services and drugs. The findings indicated that NP care was 20% less costly than physician care.

Scharon and Bernacki (1984) conducted a cost study at the Tenneco Corporation. NPs were utilized as primary care providers in the health services department. One nurse practitioner provided preventive health care and management of minor illnesses. Tenneco was able to deliver health care services at a cost of $469,562, as compared to the market value of $978,057. From this savings, the researchers concluded that NPs provided cost-effective care. This study examined only three NPs and two physicians. Third party reimbursement was not an issue for these researchers.

Zentner, Dellinger, Adkins, and Greene (1995) conducted a study in the workplace where the NP provided primary care services. One NP worked independently and referred to physicians those problems outside the NPs' expertise. At this company site, the employee's average was cost was $1,258. This savings was about half of the national average. The company also experienced fewer loss of workdays due to illness or injury.

Hospitalization Rates. The last component to NP productivity is hospitalization. Hospitalization rates display an indirect measure of economic impact. A decrease in hospital utilization and length of stay decreases the costs of medical care.

Lewis and Resnik (1967) compared NP care and physician care in a clinic. The sample consisted of 66 clients (half in the NP group and half in the physician group). These researchers found less hospitalization in the NP group as compared to the physician group. The clients had a variety of diagnoses in both groups. The researchers did not control for severity of illness.

Runyan (1975) compared outcomes longitudinally between NP care and physician outpatient care. The clients of the NPs (N = 555) utilized 50% fewer hospital days while the clients of physicians (N = 226) had an increase in hospital days. The NP group also experienced decreases in client blood pressure and reductions in blood glucose levels.

Cintron et al. (1983) examined the cost for primary care services and the cost for hospitalization for veterans administration (VA) clients with congestive heart failure. A sample of 15 clients were followed for an average of two years. The cost of care was examined before and after the introduction of a NP clinic. Outpatient costs increased from $5,518 to $16,555 but inpatient costs decreased from $153,450 to $22,275, a net savings of $120,138. The net savings was attributed to a 60% reduction in hospital utilization and to a 85% reduction in mean length of hospital stay.

In a quasi-experimental study, Kane et al., (1989) compared the cost effectiveness of 30 nursing homes with a geriatric nurse practitioner and 30 nursing homes without a geriatric nurse practitioner. Results revealed fewer transfers from the nursing home to hospitals for emergency or elective admissions in the NP group. In addition, clients in the NP group were discharged from the nursing home to home more frequently than clients without an NP.

Quality of Care

The early evaluation studies in the late 1960's through the mid 1970's centered around NPs' delivering quality health services in terms of safety and technical competency (Payne & Lyons, 1975; Runyan, 1975; Spitzer, et al., 1974). The early studies compared NPs and physicians on the cure/technical aspects of health care delivery. The cure role focused on the number of laboratory tests ordered, number of x-rays taken, and number and type of medications

ordered. Generally, they found that NPs were comparable to physicians on the technical component of care. Studies in this group are not the focus of this review.

During the mid 1970's through the mid 1980's more comparative studies were done. The comparison of NP performance focused on a variety of process and outcome variables. Physician care represented the standard of quality of care (Bibb, 1982; Davidson & Lauver, 1984; Draye & Pesznecker, 1980; Goldberg & Jolly, 1980; OTA, 1986; Ramsay et al., 1982). The emphasis during this time shifted from the cure/technical mode to more process variables in terms of time. Examples of time related events include length of client visit, number of client visits, volume of provider activities, quality of client-provider interactions, and disease specific events.

The research activities of the 1990s have been centered around identifying the differences in both processes and outcomes between NPs and physicians (practice styles and communication style), professional issues (i.e. autonomy, third party reimbursement, and collaboration), and cost-effective health care (Avorn, Everitt, & Baker, 1991; Davis, 1996; Hill et al., 1994; Langner & Hutelmyer, 1995; Lewis & Brykczynski, 1994).

Thirty years of research has shown that NPs provide safe, competent, equivalent quality of care within their scope of practice. Lewis and Resnik (1967) examined the issue of quality of care between NPs and physicians. The sample consisted of 66 clients (half in the NP group and half in physician group). After the initial visit, the researchers randomly assigned clients to a NP or physician group and followed both groups of clients for one year. Results indicated significant differences in the NP group related to a reduction in frequency of complaints, reduced tendency for clients to seek physician help for minor problems, less canceled appointments, and less hospitalization. Also there was a shift in preference for nurses to perform certain functions related to explaining, counseling, teaching, and taking a blood pressure.

The Burlington randomized NP trial (Spitzer et al., 1974) assessed the effects of having NPs as primary care providers. The results of this landmark study demonstrated that NPs can provide primary care in a safe and effective manner, with as much client satisfaction as physicians. The results also supported the utilization of NPs in a primary care setting as cost effective to society, but not financially profitable to physicians because of reimbursement restrictions for NP services. This longitudinal study had a sample of two NPs, two physicians, two study sites, and a total of 1,598 families receiving care.

Runyan's (1975) longitudinal study compared NP and physician care. Clients ($\underline{N}$ = 555 in the nurse practitioner group and $\underline{N}$ = 226 in the physician group) had chronic health problems associated with hypertension, diabetes, and cardiac disease. Results of Runyan's study indicated that the NP group had better outcomes than the physician group. The NP group had reductions in blood pressure, blood glucose levels, and experienced 50% fewer hospital days.

Goldberg and Jolly (1980) examined the utilization of NPs in an Air Force ambulatory care setting. Twenty-three PAs and seven NPs participated in this study. These researchers found NP care to be safe and equivalent to physician care. This is one of the few studies that examined NP utilization in a military setting.

Winter's (1981) thesis examined client ratings of NP and physician behaviors that measured important components of quality medical care. The particular variables studied were the provider's ability to establish a rapport with the client and provider information giving behaviors. A sample of 50 clients coming to the clinic for an initial visit for an illness were studied. The results indicated that NPs were able to establish a rapport with respondents significantly easier than the physicians. When examining provider information giving behavior, NPs scored higher than the physicians.

Frelin (1992) evaluated five family nurse practitioners (FNPs) in the U.S. Army Family Practice System. Surveys were mailed to the six FNPs, 111 physicians, including residents, and 163 FNP clients. Results indicated that FNPs perceived themselves to be competent practitioners. Family medicine physicians that worked in the same clinics as the FNPs perceived the FNPs as competent. Physicians not working directly with FNPs were less positive about the FNP role. Respondents that received care from FNPs were very positive about FNP care and satisfied with the care they received.

Ramsay et al. (1982) compared NP and physician care for 40 adult clients that had hypertension. The researchers found that the NP group had a significant reduction in blood pressure and weight after one year. The physician group did not experience these results.

Bibb (1982) simulated a comparison study of processes of care employed by NPs and physicians. A non-random sample of 15 NPs and 11 physicians independently completed scenarios. Their findings indicated that NP respondents scored higher on expressive or caring processes. Examples of processes include identifying psycho-social factors related to a problem, giving anticipatory guidance, and explaining the rationale for treatment. Physician respondents scored higher on curing or technical processes. Examples of these processes include diagnostic skills, prescribing medications, ordering tests, and formulating a treatment plan. NPs scored higher on the use of preventive measures and alternative therapies, like the use of relaxation techniques or visual imagery. NPs were consistent with follow-up care, the use of community resources, and provided more health education than physicians.

The OTA (1986) survey study examined the utilization of NPs, PAs, and CNMs in primary care. The sample size was not reported. The results of this study supported the utilization of these providers because they provided services that were within their scope of practice and provided a quality of care that is comparable to physicians. The study also demonstrated that

NPs are more adept than physicians at providing services that depend on communication and health promotion activities.

Hill et al. (1994) in a longitudinal comparison study randomly assigned 70 clients with rheumatoid arthritis to either a NP or physician group. At week zero, groups were well matched and by week 48 significant improvements had occurred in plasma viscosity and articular index in both groups. The NP group had further differences from the physician group: decreased pain and morning stiffness, improved psychological status, increased knowledge scores, and increased satisfaction with their care.

Langner and Hutelmyer (1995) explored the satisfaction with medical care of 52 clients with human immunodeficiency virus (HIV). Care was delivered by one NP and one physician in one clinic. The researchers surveyed 52 clients related to their satisfaction with care. When compared to physician care, NP care rated high regarding less waiting time, provider helpfulness and knowledge about HIV, continuity of care (seeing the same provider), access to a NP, and client education.

The American Nurses Association's study conducted by Brown and Grimes (1995) was a meta-analysis of process of care, clinical outcomes, and cost-effectiveness of NPs and CNMs. The results of this study supported the OTA (1986) results, finding that NP quality of care was equivalent to physician care; the interpersonal skills of NPs was better than physicians; NP client outcomes were equivalent or superior to physician outcomes; clients were satisfied with NP care; NPs facilitated continuity of client; and NPs improved access to care. In addition, these researchers reported that NPs spent more time per client, NP clients spent less time in the hospital than physician clients, and NP care was provided at a lower cost.

Roles

The actual role of the NP is determined by many factors such as educational preparation, personal characteristics, practice setting, supply and demand for services, years of NP work experience, and other health care providers' attitudes. The NP role, in general, has a very strong client-centered, holistic, and interactive focus (Brykczynski, 1989).

The loss of a nursing orientation was an early concern regarding the NP role due to its inherent overlap in certain functions with medicine. The fear was centered around NPs learning medically oriented skills related to diagnosis, prescribing medications, and formulating a treatment plan. Nursing leaders asked, "Would this cause the NPs to lose their nursing orientation related to caring?" The last thing the nursing profession wanted was a practitioner that was a "mini" physician (Davidson & Lauver, 1984; Linn, 1975; Vacek & Ashikaga, 1980).

Vacek and Ashikaga (1980) studied 48 recent graduates of a NP program and 209 registered nurses (RNs) regarding their professional roles and concomitant attitudes. Results of

this study indicated NP roles were broader, encompassing new medically related skills. NPs also provided client education and counseling which is a part of the traditional nursing role. When compared to RNs, the NPs attitudes reflected they had a greater impact on the availability and quality of health care. These researchers also found that even though NPs acquired medically oriented functions, this new acquisition of skills did not diminish the NPs activities related to traditional nursing.

Linn (1975) surveyed 77 internal medicine faculty, 112 medical students, 27 nursing faculty, and 135 NP students at one university to assess their attitudes regarding the care-cure orientation. In addition, the researcher examined attitudes about the health care system with relation to the care-cure orientation. The researcher found that medical faculty strongly supported the cure orientation while the nursing faculty supported the care orientation. The medical students supported the cure orientation more than NP students, but less so than their medical faculty. NP students were very similar to the attitudes of the nursing faculty regarding the care orientation. This study lends support to the idea that NP students maintain a very strong care orientation even though they are taught by physicians, do similar physician functions, and have clinical physician preceptors. The NP students had a stronger client-centered, care-oriented attitude at the end of their NP program than at the beginning. The NPs' attitude toward the system of health care as it affects clients were neither nursing oriented nor medicine oriented, but in the middle representing a fusion of values about the system. The last interesting finding from this study was that two-thirds of respondents in each of the four samples indicated the importance of care orientation. Perhaps the degree that physician respondents value curing at the expense of caring is over-estimated.

Davidson and Lauver (1984) examined 15 NPs' and 15 physicians' perceived roles on a series of vignettes. There were significant differences between NPs' and physicians' roles on six of the eight vignettes. NPs identified high role-appropriate vignettes related to psycho-social support and teaching. Physicians identified as high role-appropriate vignettes the high risk physical conditions. The other vignettes could be managed properly by either provider group, which indicated these vignettes had an overlap in roles.

Draye and Pesznecker (1980) studied the activities of 356 family NPs in primary care. Teaching was the most frequent NP intervention for clients and family. When examining the teaching activity closer, researchers found the areas NPs taught clients about were the following: plan of care (35%), diagnosis (25%), preventive health and safety (22%), procedures (12%), well-child (4%), and rehabilitation (2%). NPs focused on information necessary to perform self-care and only one-fourth of the teaching activity addressed prevention.

Brykczynski (1989) examined 199 clinical situations related to NP judgment involving 22 experienced NPs. NPs had a mean of eight years of experience. The researcher used qualitative

data analysis, using hermeneutical phenomenology. Within the NPs practical knowledge domain three trends emerged: judgment is central to "know-how"; background knowledge is important to skill development; and the nature of practice skills is experienced based. The researcher found that NPs develop diagnostic skills as a result of their attention to qualitative distinctions in client assessment (i.e. spending more time with the client; focused listening; recognizing subtle behavioral cues to get a gestalt about a client situation). On repeat interviews, NPs believed that "real disease declares itself; follow-up is everything." Another finding from the interviews revealed that NPs could anticipate certain needs of clients based on their understanding of clients' assumptions and expectations regarding the medical visit. Also, NPs were able to pick up on the clients' non-verbal behaviors. Brykczynski (1989) stated that NPs distinguish between disease (altered structure, labeling disease) and illness (human experience to stress, categorizing responses to disease). The NP focused on client responses to illness.

Thibodeau and Hawkins (1989 & 1994) examined nursing model orientation and confidence in the skills of NPs in both studies. The 1989 study was a descriptive correlational design composed of a random sample of 135 NPs. The 1994 study was a correlational design with 482 NPs. These researchers found that NPs had a strong nursing model orientation. There also was a high correlation in skills and the nursing model. NPs that had a strong nursing model orientation also had more confidence in their skills.

Avorn et al. (1991) compared the performance of 298 nurse practitioners and 501 physicians on case scenarios. Findings from this study revealed: NPs were more likely to ask additional historical questions about the client before planning therapy such as, questions about diet and psycho-social history; NPs were likely to suggest non-prescription approaches to therapy, for instance changing diet, or stress counseling; and NPs were less likely to recommend a prescription drug.

Lewis and Brykczynski (1994), with a hermeneutic phenomenological method, qualitatively described therapeutic caring from the aspects of practical knowledge and competencies of the NP healing role. The NPs studied had a mean of 7.5 years of NP practice. The number of NPs participating in the study was not reported. Components within the practical knowledge domain included " little things mean a lot" to clients ( having a deeper knowledge of the situation and meeting the clients needs) and "healing begins with listening." Listening opens the door for nursing interventions and healing. This study also identified two new NP skills related to the healing role: risk taking and sensitive humor. Risk taking was a conscious decision on the NPs part to take a calculated risk in order to effect change in clients' health outcomes. Sensitive humor involved using humor at the sensitive time to bring about tension release and healing.

Davis (1996, unpublished) studied 173 well women who were given care by 61 physicians and 112 advanced nurse practitioners, of which 87% were NPs within an Army setting. The

researcher used a descriptive correlational design. Client convenience and adequacy of health teaching were rated high. Trends were revealed when the researcher analyzed the qualitative data which emphasized the human aspects of care and the importance of time. Time was related to the clients' perceptions of convenience, caring, and overall perception of service quality.

Physician acceptance of the NP role is also based on prior experience with NPs (Lawrence et al., 1977; McCormack, Allen, & Livers, 1971). If physicians have had prior exposure to the NP role and are familiar with the role, physicians were in favor of hiring NPs in their practice.

Issues

Nurse practitioners have a legitimate role in the health care arena. They have acquired various skills through academic study, peer review via nursing standards, licensing, and changes in autonomy.

However, there are several barriers related to NP practice because of the overlap between medicine and nursing functions. These barriers relate to legal restrictions, denial or restrictions on third party reimbursement, denial of access to medical facilities, attitudes of other health professionals, and lack of knowledge by the general public about the NP role.

Most NP practice acts have been updated to include some kind of legal authority for advanced nurse practitioners. One problem with the practice acts is the statutory language which is vaguely worded, broad in content, and leads to wide interpretation of practice responsibilities from state to state. This situation opens up a debate as to what responsibilities fall within the scope of nursing or medicine; confusion and controversy are the results.

Another issue involves the legal authority to prescribe medications. Once again, the language varies from state to state and NP prescribing privileges may be independent, dependent on physician approval, or no prescription authority at all. The center of this problem lies with autonomy. The old nurse practice acts were very narrow in scope and used the terminology *under physician supervision* to describe interdependent acts between nurses and physicians. Nurses do practice under a nursing license that is not contingent upon a physician's license. The core of the issue of prescriptive authority is not the ability of the NP to prescribe the medication, but whether the state acknowledges and authorizes NPs to prescribe medications. Currently NPs prescribe medicine in one of four ways: (1) ask the MD to write a prescription for the client; (2) call the prescription into the pharmacy under the physician's name; (3) co-sign the physicians prescription pad; or (4) use protocols approved by the physician and pharmacy (Inglis & Kjervik, 1993).

The next issue/barrier to NP utilization is the denial or restrictions of third party reimbursement for NP services. This issue directly affects access to care and reflects NP

autonomy. NPs are usually reimbursed indirectly, at a reduced rate and for a narrow range of services. As a result of this situation, NPs usually practice under an employer, such as a physician, HMO, community setting, university, or government agency. An exception to this is when the NP practices in a rural area where direct reimbursement for NP service is rendered. The major concern is whether NPs should be reimbursed at the same rate as other providers for the same services. Also the lack of reimbursement affects the recognition of health promotion services (Inglis & Kjervik, 1993).

Another issue/barrier to NP utilization is denial of access to medical facilities. When NPs do not have admitting privileges they can not follow their clients through acute and chronic episodes. This restriction affects continuity of health care. Hospital privileges also demonstrate clinical competency to other providers and the community (McGivern, 1993).

Work setting factors, including attitudes of other health professionals, is another NP issue/barrier. Lack of recognition as a primary care provider, lack of administrative support, resistance from physicians and other health care workers, and restrictive protocols contribute to work setting factors that are problematic to NPs (Hupcey, 1993). Mahoney (1995) examined practice restrictions of 13 experienced NPs. These NPs had a mean of 9 years of NP practice experience and had been in their current job for five years. Findings from this study indicated that some employers continued to impose practice restrictions on NPs' prescribing of medications, even after legislative reform. Zammuto et al. (1979) examined NP work setting factors. A sample of 143 NPs from 61 clinical settings completed surveys. Their findings revealed physician-intensive settings utilized NPs least effectively and more NPs left those sites because they could not implement the NP role.

The last issue/barrier facing the utilization of NPs is a lack of knowledge by the public and other health professionals about the NP role (Washington Consulting Group, 1994). Research indicated that once the public has had contact/experience with an NP, client acceptance is high (Batchelor, Spitzer, Comley, and Anderson, 1975; Enggist & Hatcher, 1983; Southby, 1980).

Major Findings

After thirty years of quality care research, findings indicate that NPs provide safe, competent, and quality care within their scope of practice (Brown & Grimes, 1995; Frelin, 1992; Goldberg & Jolly, 1980; Hill et al., 1994; Lewis & Resnik, 1967; McGivern, 1993; OTA, 1986; Ramsay et al., 1982; Runyan, 1975; Spector et al., 1975; Spitzer et al., 1974). As can be seen from the review of the productivity and cost-effectiveness studies, there is support for cost-effective care (Cintron et al., 1983; Freund, 1993; Freund & Overstreet, 1991; Holmes et al., 1976; Holmes, et al., 1977; Lewis & Resnik, 1967; OTA, 1986; Record, McCally, Schweitzer, Blomquist,

& Berger, 1980b; Salkever et al., 1982; Scharon & Bernacki, 1984; Spector et al., 1975; Spitzer et al., 1974; Zentner et al., 1995) .

When examining the NP-client interaction, the NP exhibits an affiliative style of communication (Avorn et al., 1991; Bibb, 1982; Brykczynski, 1989; Davis, 1996; Langner & Hutelmyer, 1995; Lewis & Brykczynski, 1994; Linn, 1975; OTA, 1986; Price et. al., 1992; Winter, 1981). The client is the focus of the interaction and is encouraged to be a partner and active participant in the interaction. Another NP focus during the medical visit is assessing the clients' knowledge level regarding the health problem in order to discuss prevention and maintenance issues (Hill et al., 1994; Langner & Hutelmyer, 1995). From this perspective, the NP engages in teaching and counseling activities in order to facilitate the client's needs regarding self-care and life style issues (Davidson & Lauver, 1984; Draye & Pesznecker, 1980; Vacek & Ashikaga, 1980).

Nurse practitioners have a legitimate role in the health care arena. Several barriers to NP practice arise from an overlap of medical and nursing functions (Enggist & Hatcher, 1983; Mahoney, 1995; Zammuto et al., 1979). When barriers are removed and NPs are allowed to work within their full scope of practice, quality health care services can be rendered in a cost-effective manner.

Major Limitations

As with utilization research, results from quality of care research must be interpreted with a certain amount of caution. Prescott and Driscoll (1979) and Diers and Molde (1979) have identified several limitations of NP effectiveness studies. These limitations include a lack of performance standards for both NPs and physicians, difficulty interpreting the relationship between process variables and time, difficulty interpreting volume of activity with effectiveness, a lack of control for severity of illness, small sample and setting sizes, a lack of reporting providers experience history, and a lack of random assignment of respondents to NP and physician groups.

In the 30 studies reviewed, the common limitations were related to representativeness of the sample, not controlling for client severity of illness, and not reporting validity and reliability data regarding the research instruments (OTA, 1986; Spector et al., 1975; Spitzer et al., 1974). A sample composed of inexperienced NPs and the use of convenience samples could influence how representative the sample is of the population (Holmes et al., 1976; Holmes et al., 1977; Lewis & Resnik, 1967; Record, Blomquist, McCabe, McCally, & Berger, 1980a; Salkever et al., 1982; Sekscenski et al., 1994; Spector et al., 1975; Spitzer et al., 1974; Zammuto et al., 1979). In five out of 30 studies the researchers sampled NPs with three or less years experience (Lewis & Resnik, 1967; Linn, 1975; Spector et al., 1975; Spitzer et al., 1974; Vacek & Ashikaga, 1980). Over half of the studies incorporated convenience samples (Goldberg & Jolly, 1980; Hill et al.,

1994; Langner & Hutelmyer, 1995; Winter, 1981). Using a convenience sample has the potential of creating bias.

In nine out of 30 studies, researchers did not control the client's severity of illness or morbid conditions (Cintron et al., 1983; Holmes et al., 1976; Lewis & Resnik, 1967; Scharon & Bernacki, 1984; Sekscenski et al., 1994; Spector et al., 1975; Spitzer et al., 1974; Zentner et al., 1995). When these variables are not controlled, the generalizability of the findings is reduced.

Researchers in four of 30 studies did not report the validity and reliability of their research instrument (Davidson & Lauver, 1984; Holmes et al., 1976; Spector et al., 1975; Spitzer et al., 1974). Failure to report this information influences the accuracy of the findings.

It is very difficult to interpret variables in terms of time. Variables such as length of client visit, number of client visits, and frequency of client visits are difficult to interpret because the relationship between these variables and time is not clear. For example, is improved quality of care associated with length of client visit? Along the same pattern of thought, the same difficulty relates to interpretation of volume of activity with effectiveness. Is ordering more laboratory tests or having more follow-up visits bad care? Perhaps from the cost perspective, it is more expensive but is it undesirable from the effectiveness viewpoint? Again, the relationship between volume of activity and effectiveness is not clear.

## Physician Assistants

### History

During the 1960s, the United States experienced a social, economic, and cultural revolution that altered the provision of health care. A social consciousness was raised about minorities, the disadvantaged, and those without access to the health care system. In the previous decades, great technological advances and specialization in medicine led the public to believe that health care was inaccessible, over-specialized, and unconcerned with common medical problems. There were also complaints about the rising costs of health care and the supply and distribution of physicians (Cawley & Golden, 1983; Fasser, Smith, & Andrus, 1984b). Medicare and Medicaid were established to partially correct the deficiencies in access, but there was still a widely held belief that a shortage of medical personnel existed (Schafft & Cawley, 1987). The American public was anxious to support measures designed to increase access to health care.

As early as 1961, Dr. Charles Hudson, then the President of the National Board of Medical Examiners, called for the creation of a new category of health manpower which would increase the medical care service access of Americans (Cawley & Golden, 1983). It wasn't until 1965 that Dr. Eugene Stead established the first physician assistant (PA) program at Duke

University in Durham, North Carolina after the National League for Nursing refused to accredit a program for training nurse practitioners. In the same year, Dr. Richard Smith at the University of Washington in Seattle established the first MEDEX program (Bottom, 1987). The MEDEX program was shorter in duration and required an on-the-job training component. Both program directors realized that Vietnam veterans were returning home with a vast amount of medical training and experience. This was the primary personnel resource for these new programs (Schafft & Cawley, 1987). The new category of health care workers would extend primary care to those currently without access and would focus on those elements that physicians placed little emphasis on, such as counseling, education, and prevention. In part, this idea was borrowed from other countries using physician extenders, i.e., Russia and China.

The concept of physician extenders is not unique to the United States and dates back to the 1700s, where, in Russia, non-physician practitioners called "feldshers" provided the majority of medical care to the Russian Army. Prior to 1917, feldshers provided low-cost health care to the poor, and subsequently were perceived as providing second-class rural medicine. In an attempt to equalize care between urban and rural areas, feldshers were replaced with physicians (Pitcairn & Flahault, 1974). However, the demand for health care exceeded the ability to provide enough physicians and the training of feldshers was resumed. To this day there are approximately one million feldshers in practice. The USSR Commonwealth continues to train as many physicians as it trains feldshers: 30,000 every year (Herrera, Gendron, & Rice, 1994).

China extensively utilizes physician extenders to provide care to their large rural population. During the Great Proletarian Cultural Revolution in the 1960s, the "barefoot doctor" (now called village doctor) concept was developed. A "village doctor" is a peasant who has had basic medical training and gives treatment without leaving his/her agricultural responsibilities. There are over a million "village doctors" and numerous "worker doctors" in China's factories as well as "Red Guard doctors" who are housewives serving as physician assistants in urban neighborhood clinics (De Geyndt, Zaho, & Liu, 1992; Sidel, 1972). France also utilized physician extenders called 'Officiers de Sante' in the nineteenth century (Heller, 1978). The successful utilization of these physician extenders in other countries provided a basis for the development of the physician assistant profession in this country.

The programs at Duke University and University of Washington set out to graduate physician assistants to meet the primary care needs of the public. They began without the usual formal exploration of the need for the PA, acceptance of the PA, or the type of tasks to be delegated. There was no study of the curriculum demonstrating how it might best meet the needs of the new role. However, in 1971, the American Medical Association, along with various collaborating sponsors, adopted guidelines for PA program accreditation. These guidelines were published as the Essentials of an Approved Educational Program for the Assistant to the Primary

Care physician. A natural progression was certification. Thus, the first National Board Exam was given in 1973. In this same year, the Department of Defense graduated its first PA class in an effort to remedy the physician recruitment crisis and the abolition of the physician draft (Hooker, 1989). In 1974, 14 national organizations joined to form the National Commission on Certification of physician assistants (NCCPA) (Carter & Gifford, 1982; Fasser, Andrus, & Smith, 1984a). Thirty years after its inception, physician assistants have established an accepted profession, complete with occupational journals, educational and certification requirements, and professional organizations.

Profile

There are approximately 23,350 physician assistants in practice today in the United States (Jones & Cawley, 1994). The American Academy of Physician Assistants (AAPA) conducts an annual survey of its members. In 1995, 14,106 PAs, or approximately 76% of the AAPA Fellow Members, returned the survey. The results revealed that the annual income (excluding military members) is $61,010. Those with a Bachelor of Arts degree numbered 57.5%. The mean number of outpatient visits completed by PAs per day is 21.3. Military service statistics revealed that 4.2% are on active duty; 1.8% in the Air Force, 1.7% in the Army, and 1.1% in the Navy (AAPA, 1996).

Education

The education of physician assistants takes place in 58 programs throughout the country (Jones & Cawley, 1994). The typical program is a two-year curriculum, set in an academic health center or university (84%), that awards a Bachelor's (63%) or Master's degree (16%) upon completion. Traditionally, primary care medicine is the emphasis of the programs (Clawson & Osterweis, 1993).

Much of the framework for PA educational programs was suggested by the American Medical Association's House of Delegates in 1971 (Roy, 1984). Two basic features of the profession were instituted: the training would be relatively brief in duration by comparison with medical school and the PA would serve in a supervised practice under the direction of a medical doctor. New skills would not be developed to differentiate the PA from the doctor, instead, emphasis was placed on the standard medical model. The program was not to be based on the nursing model, nor would the tasks be performed independent of physician supervision (Schafft & Cawley, 1987).

The curriculum of a typical PA program averages two years (98 weeks), but can vary from 52 to 156 weeks. The sequence is similar to that of the traditional medical school model: Phase I: basic medical and behavioral sciences, Phase II: introductory clinical medicine, Phase III:

clinical rotations (Clawson & Osterweis, 1993). Specifically, the pre-clinical studies include anatomy and physiology, microbiology, pharmacology, psychology, clinical medicine, physical diagnosis, preventive medicine, and clinical laboratory procedures. The clinical portion consists of preventive health care, client education, and utilization of community health and social service agencies (Bottom, 1987).

Entry to the profession requires graduation from an approved PA training program and/or successful completion of the National Certifying Examination prepared by the National Board of Medical Examiners. To maintain certification, re-registration is required every two years by documenting 100 hours of Continuing Medical Education. Successful completion of the re-certifying exam every six years is also required.

Systems Science in 1977 collected data on 38 Department of Health Education and Welfare-funded education programs and assessed the selection, training/education, and deployment of nurse practitioners and physician assistants in 38 programs. The data showed significant differences in goals and priorities between NP and PA programs, but it was clear that there were more similarities than differences concerning which skills are most important. All programs emphasized medical history taking, physical examination skills, and assessment of clinical information. The NP programs differed from the PA programs in that they also emphasized the development of a health maintenance plan and the counseling of clients on psycho-social problems.

In 1987, Rolling and Schafft reported on a survey of PAs and their educators. Using qualitative analysis and a case-study method, 46 PAs and 45 physicians/other personnel were interviewed. The physicians were more likely to describe PA duties globally, rather than by task. Sixty-six percent of the respondents felt that the PAs were well trained for the work they were expected to do, but many others found it important to have specific on-site training to augment the basic education. There was little concern by the PA or physician that patient care was beyond the PAs capabilities. A limitation of the study was the lack of random selection of sites.

Practice Settings

Results from the AAPA's 1995 survey of 14,106 PAs, with a response rate of 76%, revealed that 50% of the membership work in a primary care setting (family/general medicine, general internal medicine, general pediatrics, and ob-gyn); the other 50% work in emergency medicine, general surgery, internal medicine and surgical specialties, and industrial medicine. Physician assistants work in group physician practices (29.5%), hospitals (non-university) (16.5%), solo physician practices (10.2%) clinics, (9.8%), university hospitals (7%), HMOs (6.8%), military facilities (4.3%), and a variety of other settings to include corrections facilities, nursing homes, and home health agencies.

Scope of Practice

The vast amount of irregularity in the scope of a physician assistant's practice is due, in part, to the fact that day to day activities are physician driven. The practice setting and the specialty of the physician, and, to a great extent, his/her willingness to delegate dictate the breadth of a PAs responsibilities (Pitcairn & Flahault, 1974).

Jacobs, Johnson, Breer, and Nelson (1974) examined the activities of PAs in primary care settings. The information was generated from two instruments: a 24-hour activity log and a task inventory list. Additional information on characteristics of clients was obtained from client contact forms. All instruments were completed either by the physician before the arrival of the physician assistant, or several times during the preceptorship by both the physician assistant and the physician to document changes during the training period. Respondents maintained activity logs for 14 consecutive days in each of five collection periods. A total of 460 tasks were divided into ten major categories. Significant differences in time spent by physicians and PAs were for routine hospital visits and emergency care in the patient's home, with the physician spending greater amount of time than the PA for both activities. Also, the physician performed significantly more client instruction and administrative tasks. The PA performed significantly more client examinations. In terms of the types of clients seen, the PA saw significantly more younger clients and fewer females. It was concluded that the activities of a physician assistant can be clearly distinguished from that of a physician. The limitations of the study include the self-reporting nature of the surveys and that the subjects were recent graduates.

Practice Patterns. Lairson, Record, and James (1974) compared the practice patterns of a PA to the practice patterns of six internists in Kaiser-Permanente's Vancouver, Washington clinic. The objective of the study was to determine the differences in practice of the PA and the internists with respect to: (1) number of client contacts, (2) type of morbidities handled, (3) complexity of medical problems, (4) telephone consults, and (5) use of laboratory and x-ray tests. Data were obtained from a computer data base and client records. Results of this study revealed that the PA generally saw fewer clients with complicated problems, conducted fewer physical examinations, and saw a greater volume of clients than the internists. The PA saw more acute medical problems and provided fewer preventive services than the internists. The PA ordered lab work in 14.8% of client contacts compared to the physicians, who ordered tests on 23.9 to 38.9% of the client contacts. The PA ordered x-rays in 20% of the client contacts compared to the physicians' 1.8% to 25.7% of the client contacts.

Kane et al. (1976b) focused on the practice site and how it had changed before, during, and after a physician assistant had been added to 13 private practices. Patient contact records, a network analysis of client flow, and activity logs were monitored and used as the data for one two-

week period before the physician assistant was added to the practice, a two-week period during the training period, and two two-week periods one or two years after employment. Trained observers collected some data and self-reports by the physician and physician assistant were obtained. Results revealed that the age-sex distribution of clients seen by the PA differed from that of the physician. The physician assistant saw fewer female clients in the 15 to 64 year age group. The reason for visit, or mix of clients, did not differ significantly among the providers. Waiting times decreased significantly from 27 to 22 minutes between the training and employment periods. Both the physician assistant and the physician spent a similar amount of time with clients. It was concluded that the physician assistant created an additive effect, as opposed to a substitutive effect for the practice. The PA served as another pair of hands, extending the amount of services offered in a semi-collegial manner with the physician.

Riess and Lawrence (1976) studied nurse practitioners and physician assistants at 12 remote sites selected from 29 different practices. Each site was visited twice during the study period. Nurse practitioners, physician assistants, backup physicians, clinic staff, and community residents were interviewed, observed, and/or completed questionnaires. Approximately 90% of all reported visits were managed locally by the nurse practitioner or physician assistant without referral to physicians. Slightly less than half (47%) of all encounters were for care of new problems in clients previously seen at the clinic. The primary problems for which clients received care were for health maintenance exams (17%), trauma (12%), upper respiratory diseases (12%), and skin diseases (8%).

Steinwachs, Shapiro, Yaffe, Levine, and Seidel (1976) studied the distribution of ambulatory care between physicians and NP/PAs in the pediatric and adult medicine departments of a prepaid group practice. The study covered a three-year period during which time NPs and PAs were introduced to the system. Two data sources were utilized for this study: personnel and accounting records provided data about hours worked and the encounter form was the source of diagnostic and utilization data. Results revealed that the age of the enrollee was a significant factor in the distribution of services by provider. NPs and PAs were twice as likely to be the initial provider in the 15 to 24 years of age group than physicians, while those clients over 45 years of age were seen over three times more frequently by physicians. Only 38% of the total encounters were seen initially by a physician in 1973 as compared to 79% seen by physicians two years earlier. The annual number of client visits per full-time equivalent physician decreased. Physicians retained clients with chronic conditions and increased their consultation rates. The NPs and PAs assumed a primary role in the diagnosis and treatment of acute, self-limiting problems. A limitation of this study was its use of a population of NP/PAs in their introductory phase to a new health care system.

Duttera and Harlan (1978) conducted a study of 14 primary care practices to determine appropriateness of medical care on 788 outpatient visits. An observer recorded data of each client visit by sitting in the examination room during the appointment. Results revealed three practice patterns: all clients were seen by the PA initially followed by the physician; clients were managed concurrently by the PA and physician and were not pre-selected; and PAs saw clients that had specific problems. Sixty-one percent of the visits were handled independently by the PAs. Older, female clients were more likely to be seen by physicians. Physicians provided more client education than the PAs. Interestingly, the PAs managed more severe clients when the clients were randomly assigned to either provider. When the clients with specific problems were assigned to the PAs, they saw less severe clients.

Repicky, Mendenhall, and Neville (1980) compared nurse practitioner and physician assistant practice patterns. The objective was to determine the impact of each provider on the quantity and nature of primary care services provided. A sample of 341 NPs (8,000 client encounters) and 356 PAs (15,000 client encounters) maintained a detailed recording of their patient care activities for a three day period. Results indicated that PAs have more client encounters per week (94 vs 50), they spend more time in direct patient care activities (314 vs 200 minutes per day), see a higher percentage of surgical problems (10.6% vs 4%), see a smaller percentage of clients for health maintenance activities (10% vs 15%), use most of the diagnostic procedures less frequently than NPs, provide client education for a smaller percentage of clients (22% vs 38%), provide less complex counseling services, generate more income based on the number of clients seen per day (14 vs 8), spend less time with each client (13 vs 19 minutes), but generate higher charges per client encounter ($12 vs $10). It is unclear whether the tool had been tested for reliability and validity and the self-report nature of the study is a limitation.

Weiner, Steinwachs, and Williamson (1986) examined the practices of non-physician providers within three large competitive HMO's, as well as the physicians', nurse practitioners', and physician assistants' views regarding the ideal role of the non-physician provider. These roles were also compared to the Graduate Medical Education National Advisory Committee's (GMENAC) (1980) recommendations. Each HMO had an enrollment of about 100,000 clients. NP and PA visit rates were documented for over a hundred morbidities which accounted for approximately 50% of each specialty's workload. One HMO made use of NPs and PAs at rates even higher than GMENAC's national ideals. The other two were lower. It was concluded that acceptance and the role of the NP and PA were no longer issues. Instead, the limits on their involvement appeared to be related to considerations of cost, availability, and the increasing number of physicians competing for similar opportunities. A limitation of the study was the questionable reliability of the GMENAC estimate.

In a 1977 survey in a large HMO, Johnson et al. (1985) estimated the share of office visits that primary care physicians report can be safely handled by PAs and NPs. A sample of 178 physicians inclusive of internists, pediatricians, and obstetricians-gynecologists (Ob-Gyn) with a response rate of 71%, 82%, and 94%, respectively, were surveyed. Results indicated that pediatricians and internists felt that 53% and 61% respectively of their office visits could be safely delegated. The most frequent reason for not delegating visits were client preferences for having the same physician. They also revealed that there was a need to see a full range of cases in order to maintain overall proficiency. There was an obvious limitation of just one setting and the reliability and validity of the tool was not mentioned.

Willis and Reid (1990) surveyed Montana physicians (79% response rate) to determine their level of confidence in their PAs ability to prescribe prescription drugs. Montana PAs were surveyed and 78.7% responded to determine what therapeutic agents they recommended. Montana did not sanction prescription privileges for PAs. Results suggested that the physicians were confident in their PAs ability to prescribe most therapeutic agents, except for blood modifiers and narcotics. Surprisingly, the responses of the PAs were similar to the physicians.

Task Delegation. Despite the irregularities in delegation, there are some basic, generic, categories of tasks that PAs perform. These might include history taking, physical examinations, simple diagnostic procedures, data gathering, synthesis of data for the physician, formulation of diagnosis, initiation of basic treatment, management of common acute and emergent conditions, management of stable chronic conditions, counseling, and supportive functions (Bottom, 1987).

Appropriate use of the PA can improve quality of care by allowing the physician adequate time for complex problems (Hein, 1974). Borland, Williams, and Taylor (1972) conducted a study to determine which duties were appropriate for delegation to a physician assistant. A sample of 1,997 physicians in the 27 county region of the Susquehanna Valley Regional Medical program were mailed a self-coded questionnaire that was designed by the researchers. The response rate was 40%, with 637 questionnaires returned. Respondents were not significantly different from the total physician population in terms of specialty or form of practice. Results indicated that 56% of the physicians identified only one category of duties that was inappropriate for delegation to a PA: "identifying and ordering lab and radiology studies." There was also considerable support among the physicians for employing trained assistants. Limitations of the study include the lack of reliability/validity testing of the questionnaire, low response rate, and the possibility of a biased sample.

Parker and Delahunt (1972) surveyed physicians who were members of the Dallas County Medical Society. Forty percent (630 out of 1,572) returned usable data. Physicians approved of the performance of 67% of listed tasks by a physician assistant. The bulk of

disapproval came in the areas of physical examinations and special procedures. Specialist physicians did not differ in their responses from general practitioners. Physicians who graduated in the last 25 years were more disposed to approving tasks for performance by a PA than were earlier graduates.

Glenn and Goldman (1976b) studied eight medical practices and combined both anticipated and actual task delegation analyses. Each site was recommended as having successful experience using physician extenders by outsider opinions. The investigators spent an average of three days in each practice and found that, with minor exceptions, actual task delegation patterns conformed with the 1969 attitudes of physicians as to which tasks "could and should" be delegated to physician extenders. Nurse practitioners and physician assistants were included in the study, but the actual sample size of each provider type was unclear. There was no distinction among delegation patterns for the two provider types.

Utilization of physician assistants is, in part, also determined by the public's willingness to receive care from this provider type. Breslau and Novack (1979) examined public attitudes toward delegation of medical tasks to non-physician health workers. A sample of 1,280 individuals in the Cleveland area were contacted for interviews, of which 808 interviews were completed. Respondents were asked whether they approved performance of 18 tasks by well-trained non-physician providers working under the supervision of a physician. Results revealed that public views on who should perform medical tasks varied widely across the 18 tasks on which opinions were solicited. Public attitudes toward task delegation in medical practice do not bear strong relationships to social status indicators, political self-designations, or perceived health status. The preponderance of the public resisted the delegation of tasks involving vital organs and the care of pregnant women and infants.

In 1979b, Ekwo, Dusdieker, Fethke, and Daniels reported on a study of 28 PAs and their supervising physicians in Iowa primary care practices to determine task delegation. The agreement between the physicians and PAs about the PAs qualifications to perform certain tasks was high (84% or more). They disagreed in their perceptions for performing 12 diagnostic tasks. Limitations of the study included the small sample size and lack of control for client morbidity.

Fottler (1979) sent a questionnaire to all 1,914 members of the Eighth District Medical Society (western New York). Out of a possible 1,786 respondents, 724 physicians returned usable questionnaires for a response rate of 40.5%. Results indicated that physicians used very few non-physicians. Forty-three percent of the sample indicated they did not have a sufficient demand for higher level services. They had a higher probability of delegating such tasks as taking a health history, providing health education, and guiding clients in the use of community resources. Younger physicians and those employed in group practices delegated more tasks and wished to delegate even more, than those physicians that were older and employed in solo

practices. Pediatricians and Ob/Gyn physicians were more likely to delegate than were general/family practice or internal medicine physicians.

Smith (1981) administered a questionnaire to 200 clients in a midwestern multi-specialty clinic. The clients were from a southeastern Iowa town of 25,000 blue-collar workers and farmers. The health center consisted of four family physicians , each with a full-time PA, and a pediatrician and internist. The questionnaires were administered to 50 consecutive clients in each of the four family practice teams. Questionnaires were completed prior to seeing the physician. The questions were divided into three major areas: overall attitude toward the use of PAs, relative satisfaction with PAs in different clinical settings, and client understanding of the role and training of the PA. Results revealed that the public had little understanding of the role of the PA and were confused about their education and training. However, clients were receptive to PAs that are closely supervised by a physician. Most of the clients preferred that the PA perform "routine' functions, rather than make independent decisions.

In 1985, the AAPA conducted a survey of its members and identified nine clusters of activities that were common to PAs across specialties. These tasks included gathering data, seeing common problems and diseases, conducting lab and diagnostic studies, performing management activities, performing surgical procedures, managing emergency situations, conducting health promotion and disease prevention activities, prescribing medications, and using interpersonal skills in client education and counseling (Schafft & Cawley, 1987).

In 1988, Knickman, Lipkin, Finkler, Thompson, and Kiel (1992) conducted a time-motion study of eight internal medicine residents at two urban hospitals in New York City. The tasks were broken into 1) those tasks that had to be done by a physician, 2) those that were educational only, and 3) those that could be done by a non-physician. The eight residents were observed over the course of a three-or-four day work cycle at two different hospitals for 28 hours each. A total of 1,726 activities of 67 kinds were coded, averaging 7.75 minutes each. Results revealed that only 20% of the activities required a physician. Difficulty occurred when attempting to distinguish between education and client management activities. It was concluded that client management should be restructured so that mid-level practitioners could take on enhanced responsibilities for managing clients.

Larson, Hart, and Hummel (1994) studied the differences between urban and rural practice patterns by surveying graduates of the PA training program at the University of Washington. A four-page survey was sent to 341 graduates. An overall response rate of 87% resulted from the mailings, for a sample size of 295. Those PAs practicing in rural primary care reported performing a much wider range of medical and administrative tasks than those in urban practice.

Qualitative and empirical analyses were conducted by the Physician Payment Review Commission (1994b) to better understand the current role of non-physician providers. A sample of 1,234 nurse practitioners and 9,628 physician assistants were surveyed. Results revealed that PAs mostly work in ambulatory care settings. They also work in inpatient hospital settings (29%), primary care (42%), and as surgical specialists (25%). Additionally, results of a self-report, non-random, on-site interview revealed that organizations viewed NPs and PAs as interchangeable, however they viewed their roles as different. Also, PAs tend to name more tasks that were technical in nature; NPs, by contrast, were inclined to list more nursing related tasks that were broader in scope, such as health education. The determination of the roles of all three providers was decided at the clinical or department level. Working relations amongst the provider types were described consistently as collegial and collaborative. Despite state laws, the tasks performed by NPs and PAs were largely determined by the needs of the given situation, rather than by legal statute or professional status.

Distribution of physician assistants to different practice settings has been a topic of research as well. Morris and Smith (1977) conducted a mail survey of 5,572 NPs and PAs with a 66% response rate. Results indicated that respondents were distributed disproportionately more often than physicians to primary care practices and to rural, low-income areas. It was tentatively concluded that the respondents appeared to reduce inequities in both specialty distribution and geographic location of practitioners. A limitation of the study was that over half of the respondents had graduated only within the last two years.

Trends. A trend that has been developing for several years is the increasing specialization of PAs. They are employed in hospitals, and specialties such as surgery, orthopedics, urology, and emergency care (Bliss & Cohen, 1977; Clawson & Osterweis, 1993). For example, in 1978, 74% of PAs worked in primary care; in 1989, only 55% of them did (Connell, 1992).

Perry, Detmer, and Redmond (1981) surveyed the chairmen of the departments of surgery in general hospitals with more than 400 beds to assess their current and projected use of surgical physician assistants. A sample of 552 out of 830 private and government general hospitals (military hospitals excluded) were represented, for a response rate of 69%. Surgical PAs were working in one-third of the departments, providing preoperative, intra-operative, and postoperative care. Two-thirds of the chairmen felt that the introduction of the PA into their departments had improved surgical care in their institution.

Utilization of PAs as house staff is a new trend. It is felt that PAs performing this function would markedly reduce the number of house staff members and fellows needed for care provided in teaching hospitals and could lead to a decrease in the number of specialists entering practice.

It would also facilitate and improve the training of residents by allowing for additional time for training, sharing in the call schedule, and lessening the burden of routine care. Utilization of PAs as house staff could also provide for improved continuity and quality patient care (Carter, 1986; Silver & McAtee, 1984).

Willis and Pylitt (1993) mailed a six-page survey to 2,800 PAs selected from the AAPA membership consisting of 13,500 members. A stratified random sampling method was used with one half of the sample drawn from PAs employed by hospitals (1,400) and the other half employed in all other settings (1,400). A total of 1,690 surveys were returned yielding a response rate of 60.4%. Results demonstrated that nearly half of all PAs employed in inpatient settings are substituting for physician house staff.

Down-sizing a pediatric residency program in 1991-1992 created a need for alternatives to housestaff for a 26 bed level III Neonatal Intensive Care Unit (NICU). Schulman, Lucchese, and Sullivan (1995) assessed the quality of care during the last six months of housestaff and the first six months of full NP and PA staffing. Results revealed similar weight-specific survival of the neonates and improved documentation and compliance with immunization and blood utilization during the NP/PA period. Revenue was minimally adversely affected, although the NP/PAs were more expensive by comparison to the housestaff model. Access to NICU services and quality of care was preserved, and sometimes enhanced, with nurse practitioner and physician assistant care.

Hooker (1992) felt that the trend of specialization is bound to continue because of the educational process of PAs and market forces for employment. Also, two health policies assist to increase the need for specialty PAs: federal policy continues to restrict the number of practicing foreign trained physicians and federal efforts to increase the number of primary care physicians has decreased the residency specialty slots. These factors contribute to the growing trend of PA specialization.

In 1983, there was a concern about a physician excess and how it might seriously jeopardize the future of PAs and NPs . Although there is competition amongst providers in certain areas of the country and in certain specialties, PAs continue to demonstrate economic benefits, work in settings that physicians tend to avoid, perform administrative and management functions which expand their contribution to the practice, and are willing to assume routine patient care duties and function as a member of a team (Cawley & Golden, 1983).

The current health-care environment has produced an increased emphasis on the role of the practitioner. A mandate of the best care for the lowest bid has created a system where financial constraints heads the list of concerns. This has caused a shift from the more costly specialists to primary care providers. Projections show that the demand for mid-level practitioners will increase (Burkholder & Dudjak, 1994).

Productivity/Cost-Effectiveness

The introduction of a new provider does not imply that real productivity gains will result. It is also not necessary that productivity gains will result in an increase in the output of health services. Increased leisure time on the part of the physicians may be the objective. On the other hand, potential output gains may be sacrificed for increased "quality" of health services accomplished by treating difficult or interesting cases (Jeffers, 1974).

Productivity and cost-effectiveness gains are difficult to measure because severity of illness, types of treatment, client preferences, extent of use of diagnostic tests, level of provider training, and the site and mode of delivery of care are just a few of the confounding variables. Also, task delegation and the type of reimbursement systems will impact the number of clients seen and the amount of revenue generated (Schafft & Cawley, 1987). However, attempts continue to be made to quantify the advantage of hiring physician extenders.

Productivity. Improved productivity is not just faster provision of services at a lower cost, but improved access to high quality services delivered in the most efficient manner. Barriers to productive and cost effective utilization of physician assistants that must be overcome include professional territorialism, licensure restrictions, educational isolation, physician resistance, and institutional inertia (Hereford & Rutter, 1993).

Soon after the introduction of the physician assistants to the health care system, studies were conducted to determine the actual productivity of this new provider type. Questions were raised about the number of clients seen and the amount of physician time utilized for consultation.

Smith, Anderson, and Okimoto (1971) counted the number of client visits made to nine medical service units for the months of November, February, May, and August in the year preceding the arrival of a physician assistant and repeated it for the same months during the next year. The same data were collected during the same time frame on nine other practice units without the addition of a physician assistant. All medical service units were matched on the basis of geographic location, size of the community served, and proximity to major referral centers. Results revealed that the medical practices with physician assistants increased the percentage of clients seen by an average of 40%, ranging from 14% to 63%. It is interesting to note that the PAs added to these practices were still in training status. It appears that productivity improves and reaches a plateau with experience. Those practices without a physician assistant had an increase in client visits of only 1.3%.

Lasdon, Mark, Major, Oaks, and Kretzing (1974) measured the reduction in physician time per client by adding a PA to the practice in two different settings. One setting was a university medical center group practice that employed four internal medicine physicians that practiced part time as faculty. The other setting was a group family medicine practice. The PAs included in the

study were in their second year of their training program. Data was collected by the clinical staff who filled out a form for each client encounter. Results revealed that the university PA reduced the mean physician-time for clients whom they saw jointly. The PA in the small-town practice was managing his own clients in six-months and effectively reduced the physician-time to zero and increased the access to care by 50 percent. The percentages of acute, chronic, and general clients seen by the physician in both settings was also altered by the addition of the PA. Overall, the PA managed the general and acute clients leaving the chronically ill clients to the physician. Limitations of this study include the fact that the clinical staff were responsible for collecting data which may have resulted in different results based on site conditions. The PAs were students which may have impacted their productivity measurements.

Nelson, Jacobs, Breer, and Johnson (1975a) used practice appointment books to record the number of client visits during the year before the arrival of the PA and for a period of 2.75 years after their arrival in 13 practices. Practices using PAs had a 12% increase in the number of client visits during the first year of utilization and an average increase of 37% 1.75 years later. The PA provided care to 28% of the clients, and in company with the physician, an additional 10%. No changes across practices were noted in client waiting times or time spent with clients by physicians. The data appeared to suggest that the impact of the PA was more a function of what each physician chose to do with his/her practice; it increased the options available to the physician in organizing the practice.

Glenn and Goldman (1976a) analyzed strategies for utilizing newer types of physician extenders. Eight sites were selected with the following criteria in mind: A minimum of one year's experience with an extender (nurse practitioner or physician assistant) with a physician on the premise, an orientation toward primary care, and a fee-for-service payment mechanism. Patient flow patterns were observed and broken down into three distinct methods: series, parallel, and consultative. A computer simulation model compared these three strategies for 82 client visits and results revealed that the parallel strategy would be most productive in terms of client visits/hour when a physician employs one physician extender. As the number of physician extenders increased, the series strategy, followed by the consultative strategy, became more productive.

Mendenhall (1978), in a national study, assessed the utilization and productivity of nurse practitioners and physician assistants in primary care. The sample size was 455 providers. A matched group of comparison practices met the same criteria except they did not employ NPs or PAs. Daily professional activities were collected using a diary-type instrument. Patient volume, time in patient care, and revenue generated were studied. Results revealed that PAs were considerably more productive than NPs. The cause of the difference was not clear, although NPs spent more time with each client. The practice arrangements seemed to greatly influence

productivity. PAs had more direct client encounters (14.2 vs 7.9) per day, spent more time in direct client contact (188.5 vs 153.5 min.) and generated double the gross dollar income per day ($172 vs $85). The addition of an NP/PA to a practice tends to increase overall practice productivity in terms of number of clients seen by an average of 50-57%. The optimum ratio of NP/PAs to physicians appeared to be two to one.

O'Bannon, Mullolly, and McCabe (1978) conducted a study in which clinic observers sat in the hallways of the eight clinics of the Department of Medicine in Kaiser-Permanente in Portland, Oregon. They observed and recorded the amount of time that five PAs and 14 physicians spent with clients in exam rooms, in offices, in waiting rooms, and in hallways. Data was collected for three months. Results revealed that whether the provider was a PA or physician made little difference in the length of time spent with clients. Most of the variation was explained by system-related characteristics. The principal determinant of provider time was the client load (number of clients per minute) and the number of associated morbidities. Mouth, nose, dermatology, and ear symptoms took less time than when no readily apparent symptoms were present. Digestive and psychiatric symptoms required more provider time.

Olsen, Kane, Manson, and Newman (1978) sought to determine if the addition of a PA to a practice made a positive financial impact on a physician's practice. Ten practices in Utah, Colorado, and Idaho were studied. Claims made to a third-party payer were utilized as a measure of indirect hospital activity. The claims were examined for two years prior to the PAs' addition to the practice, for one year during the preceptorship with the physician, and for the first two years of employment. The PA practices billed a greater number of services than did the controls, even before the PA arrived. This may indicate that there were substantial differences between the practices of physicians who do and do not hire PAs. Even so, the PA practices billed for a significantly greater number of services than did the controls using a one-tailed t-test for the total charges, as well as the laboratory, X-ray, and outpatient/office charges for all three time periods. The total difference (in 1978 dollars) was $11,308/year, whereas the difference for surgery was only $1,844, and other inpatient charges was $928. The primary impact was in the areas of outpatient, office, and laboratory/X-ray charges.

Scheffler (1979) made an estimation of productivity based on a national sample of data on physician extenders. The data were obtained from a mailed survey to 1,792 physician assistants with a response rate of 1,355 or 75.6%. Three types of data were collected: mode of practice, work activities, and types of clients treated. It was concluded that PAs are approximately 63% as productive as physicians and over 35% more productive than other non-physician medical personnel. Also, three PAs could be trained at the cost of one physician and these three PAs could produce 1.8 times more visits than one physician.

Cyr (1985) conducted a study at an Air Force clinic in San Antonio, Texas over 12 months in an effort to identify the number of outpatients seen on a daily basis by a physician assistant and a physician. Results revealed that there was no statistically significant differences in the number of clients handled by the providers when both functioned in the same outpatient setting with similar practice schedules. Morbidities were not controlled for and there was only one of each provider type.

Sparer, Tanna, and Cahn (1986) conducted a test to determine the relative advantages and disadvantages of cost-based and fee-for-service reimbursement for physician-directed clinics that employed PAs or NPs. Thirty five clinics from California and Tennessee were involved in the two-year study. Results revealed that the PA/NPs in the cost-reimbursed clinics generated almost 2.5 times the number of visits as did their counterparts in fee-for-service clinics.

Harbert, Shipman, and Conrad (1994), in an attempt to identify how physician extender (PE) time was being utilized, distributed three self-reported surveys that were completed over a four-week period by 31 PE's across eight different departments in a large group practice in a tertiary health care system. Of the 23,924 clinical activities recorded, it was discovered that 4.15 activities were completed per hour for an average nine hour day. Of the PE's time, 43% was spent on direct patient care and 57% was spent on indirect care. The sample was a convenience sample, the time period for data collection was relatively short, and all data were self-reported.

Multivariate analyses of data collected in 1984 and 1985 showed that many of the key factors previously found to influence physician productivity were still important in the mid-1980s. Delegation in primary care and large group practices continued to be significant and substantial productivity gains were possible through increased delegation. Unproductive physicians in all specialties used fewer assistants than productive physicians (Hurdle & Pope, 1989).

Models have been developed to mathematically determine the productivity of physician extenders. Golladay, Miller, and Smith (1973) estimated that physician extenders could increase the productivity of a primary care practice by up to 74%. Pondy, Jones, and Braun (1973) conducted a study to formulate a theoretical model of the typical medical practice and to draw conclusions about the actual and potential productivity of PAs. For each of the nine practice sites employing eleven PAs, data were collected on all client contacts for a two-week test period. Results revealed that the physician should spend all of his time on first minor visits; the PA should spend 80% of his time on first minor visits and 20% on first major visits. House staff should spend 40% of their time managing all follow-up visits, 45% of their time on first major visits, and the rest of their time managing first minor visits by themselves or with the PA. It was estimated that adding a PA to a practice already staffed by three physicians and a nurse increases productivity by 26%. The PA is potentially about 70% as productive (2.2 versus 3.1 clients per hour) as the physician.

Reinhardt (1973) contrasted the strengths and weaknesses of the various mathematical models. He felt that the most important source of future increases in physician productivity would be the substitution of paramedical personnel for the physician's own time and that research to date had indicated that the typical provider of primary care had not pushed substitution to its technical or economic limits.

Hershey, Kropp, and Kuhn (1978) utilized a combined optimization-simulation model to examine the extent of productivity and economic benefits to be gained from adding a PA to a one-physician ambulatory health care practice. It was estimated that the productivity gain may be as small as 20% and the increase in net income may be negligible when client waiting time, waiting room congestion, practice hours, and supervisory requirements are taken into account. A year later he concluded that no single analytical technique can provide a realistic analysis of the productivity potential of PAs and that existing models can overstate productivity gains (Hershey & Kropp, 1979). Major (1980) commented on Hershey's conclusion, and stated that the model applied only to the case where everything but the addition of the PA is held constant; the number of clients seen is not the only measure of productivity in a physician's practice.

Consultation. Record, Blomquist, Berger, and O'Bannon (1977) conducted clinical observations at Kaiser-Permanente and found that, on the average, five PAs consulted with their supervisors for about 12% of the office visits. Individually, the consultation rates ranged from 5% to 20%. The number of morbidities, the presence or absence of a chronic disease, chart availability at the time of visit, the age and sex of the client, whether the visit was initial or follow-up, whether it was a walk-in or scheduled appointment, and physical distance between the supervisor and PA were variables that were examined which might affect whether or not to consult. Chart review revealed that none of the variables determined consultation except physical distance between the supervisor and the PA. Adjoining offices appeared to promote consultation, different corridors discouraged it. Also, consultation appeared to be prompted primarily by factors discovered by the PA during the examination. Lastly, PAs seemed to practice conservatively in that the medical team reviewers found some consultations which were probably not necessary for quality assurance.

Ekwo et al. (1979b) contacted by mail all 30 family physicians in the state of Iowa employing PAs. Permission was obtained from 15 family physicians employing 19 PAs. Fifteen of the 19 practice sites were family practices, and four were internal medicine practices. Data were also obtained from 28 PAs at 19 practice sites for a response rate of 63%. Six of the 28 PAs practiced at satellite sites and the remaining 22 PAs practiced at non-satellite sites. Three research assistants collected data for two consecutive days in July 1977 and then again in November 1977. Patients presenting with symptoms of urinary tract infection, sore or strep throat,

and hypertension were included in the study. The tasks performed by the PAs were observed directly for these clients. The actual time PAs spent with their clients and the length of client visits were documented. Results for the 1,036 client visits at 15 sites revealed that PAs consulted with the physicians for 12% of the clients seen by the PAs.

Using the same data from the 19 practice sites in Iowa, Ekwo, Daniels, Oliver, and Fethke (1979a) studied the differences in the types of physician supervision the PA received at satellite (separate from the major practice site of the supervising physician) and non-satellite clinics. Results revealed that the physicians supervised PA functions in 12.9% of the clients seen by the PAs at non-satellite and 15.9% of clients they saw at satellite practice sites. The physician spent 9.2 minutes per client at satellite clinics, compared to 4.4 minutes per client at non-satellite clinics. It was concluded that PAs working at satellite clinics appeared to receive as much supervision as PAs working at non-satellite clinics.

Substitutability. Typically, when less technology is available, reliance is greater on more highly skilled personnel. Conversely, when technology is increased, more auxiliary personnel are substituted for physicians (Shuman, Young, & Naddor 1971). The current state of technology would seem to dictate high utilization at precise rates of non-physician personnel. However, the ideal mix of physician extenders and physicians remains a mystery. We do know that physician extenders are not perfect physician substitutes, but the services they provide could reduce the number of physicians required and help meet the health care needs of the nation (Appel & Lowin, 1975). The substitutability depends on three variables: the percentage of a physician's workload that can be delegated, the productivity of the each provider type, and their relative cost (Schweitzer & Record, 1977). In an effort to quantify the appropriate mix of physician extenders and physicians, several research projects have been conducted to understand these variables.

Scheffler (1977) sent a survey to all graduates of physician extender training (PAs, NPs,) as of June 1973 to determine the distribution of tasks to include patient care, lab work, clerical duties, and teaching responsibilities, and their salary levels. Fifty five percent of the 498 PAs and 65% of the 610 nurse practitioners responded to the survey. Results from this self-reported survey revealed that the respondents spend more of their time in patient care when working closely with three or fewer physicians in general medicine. NPs reach a maximum amount of patient care when working with one physician, PAs reach this maximum with two physicians.

The Bureau of Health Manpower (1976) funded a study in which a panel of medical professionals created the Maximum-Substitution Model to determine the outer limits of PA substitutability for physicians. A total of 36,280 visits to Kaiser Permanente's Portland, Oregon, adult primary care clinics were examined. Results revealed that PAs were capable of treating

83% of the presenting problems. If physicians were replaced by PAs, Kaiser Permanente would have reduced their provider salaries by 16%.

Using this same data base, Record et al. (1980a), compared the case mix in this sample to one from the National Ambulatory Medical Care Survey. The ratio of routine office visits appeared to be 5% higher for Kaiser-Permanente. Then, comparing the substitution estimates to the literature, the research team lowered the delegation figure to 75%. Even with the lower delegation rates, it was estimated that full substitution would save the nation billions of dollars, and, in particular, provider costs would be reduced by some 30%. Using the most conservative estimate and the most realistic model simulation, the cost ratio was predicted to be 0.28 and the substitution ration at 0.63.

In a prospective study in a primary care practice HMO in which NPs and PAs used protocols, Greenfield, Komaroff, Pass, Anderson, and Nessim (1978) compared the efficiency and cost of this protocol system to a physician-only non-protocol system. Over five months, data were collected on 472 clients with respiratory infections, urinary and vaginal infections, headaches, and abdominal pain. A sample of 203 clients were randomly assigned to one of the two systems. Results demonstrated that in the NP/PA system, physician time per client was reduced by 92%, from 11.8 to 0.9 minutes per client and average visit costs, inclusive of provider time and charges for laboratory tests and medications, were reduced by 20%. Limitations of the study were the small sample size of providers (seven physicians, two PAs, and two NPs) and the quality of care was not monitored.

Buchanan and Hosek (1983) and Hosek and Roll (1979) tested a larger mix of extenders to physicians at four Air Force Bases over a two-year study period. One primary care clinic at each site was staffed with provider teams consisting of one physician and two or three PAs (or in some cases, primary care NPs). Each team was assigned a panel of clients. A patient contact record was completed by the client and provider for 18,053 visits. Results revealed that during the project, two-thirds of the primary medicine clients were seen by PAs. Prior to the demonstration project, with a ratio of one physician to one PA, physician assistants were treating only one in seven clients. PAs could substitute for physicians one-to-one for 80-90% of the clients whose problems lie within the PAs expertise. The activity analysis revealed that the most cost-effective staffing pattern included three physicians and eight or nine PAs, depending on the complexity of the workloads. The majority of clients with serious problems saw physicians, while over three-quarters of clients with minors problems saw the NP or PA. The demonstration project with the higher ratio of NP and/or PA to physician conserved the, relatively, more scarce physician time for the more serious cases. PAs consulted with their supervisors on 6% to 7% of their office visits.

Green and Johnson (1995) completed an analysis of the costs of replacing residents with mid-level practitioners to limit the number of first-year training positions and alter the configuration of primary care physicians and specialists. The study found that, depending on the replacement strategy used, the proposals could require New York City-area hospitals to hire thousands of mid-level practitioners and other staff to cover client services, costing a minimum of $242 million annually. The committee concluded that three mid-level practitioners would be required to replace each resident.

Cost Effectiveness. Cost effectiveness, measured in strictly economic terms, would take into account total revenue generated by the PA minus total PA expenses (Cawley, 1986). Nelson, Jacobs, Cordner, and Johnson (1975b) studied revenues generated and expenses incurred to determine the financial impact of 12 salaried PAs working in primary-care practices. A daily log was used to gather information on revenues generated during a four-week period. Annual revenues produced were an average of $28,190 per year using one method and $30,210 per year using another method. Ten of the 12 practices made substantial gains of estimated revenue over expenses as ascribed to the activities of the PA. The researchers concluded that the economic viability of a PA depends on the willingness and ability of the physician to delegate tasks and on the personal and professional qualities of the PA. Limitations of the study were that the sample was a select group that had worked together and the PAs' salaries were well below the national average.

Record and O'Bannon (1975) measured the total output of services for the Department of Medicine at Kaiser-Permanente over a period of one year. Trained observers sat outside examination rooms timing visits and monitoring 2,681 outpatient visits in 160 clinic half days for physicians and 81 clinic half days for PAs. The researchers found that the use of laboratory and x-ray resources for the same morbidity situation was very similar, as well rates of appointment failures and time spent with clients. There were no real differences between physicians and PAs with respect to overhead costs. The most striking difference was in the basic salary or income, plus fringe benefits.

Miles and Rushing (1976) matched three physician-physician assistant practices in a rural county in Southern Appalachia with three control practices without a physician assistant to determine utilization rates, types of care, hospitalization rates, and the role of the PA. Data was collected during six collection periods for a total of 32 weeks. Data were collected just prior to the addition of the PA through approximately two years of employment. Results showed that utilization increased, the type of care remained stable, hospitalization rates increased, and the PAs functioned as substitutes. The authors concluded that although PAs increased utilization,

they may not reduce the long-range cost of medical care through providing more preventive or ambulatory (as opposed to hospital) care.

Schneider and Foley (1977) described the use of a mathematical manpower model and revealed the results of an analysis of the effect of physician extenders on medical costs and manpower requirements. It was found that when the salary of the physician extender reached 52% of the salary of a physician's, the NP/PAs lost their cost effectiveness.

Tompkins, Wood, Wolcott, and Walsh (1977) included adult clients presenting with acute respiratory and ear symptoms over a 14 to 21 month period in two different clinics to examine their illness outcome, client satisfaction, and medical care cost. Data were obtained for all clients approximately two weeks after the index illness by way of chart review and phone interviews. The two facilities were the Matthew Thornton Health Plan, an HMO in Nashua, New Hampshire and Brooke Army Medical Center, in San Antonio, Texas. Patients were cared for by three different types of providers: physicians, PAs, and military medical assistants. Results revealed that outcomes were similar, but medical care costs were highest for the physician's clients. One-third of the total direct costs were for diagnostic tests (chest x-rays and throat cultures) and 60% to 80% of medication costs were due to non-prescription drugs used for symptom relief.

Wright, Kane, Snell, and Woolley (1977) examined the relationship between levels of medical training and direct costs for 1,700 acute illness episodes treated in two ambulatory-care clinics at the University of Utah. Faculty, family practice residents, and physician assistants provided the care. They consisted of nine attending physicians, 12 first-year, 14 second-year, and 11 third-year family practice residents, and two PAs. Outcome measures were based on a previously tested seven-level functional status index. Presenting functional status was also recorded to reflect the severity of impairment created by the current illness. Using the same tool, the interviewer then saw the client again in his/her home to obtain outcome functional status. Results on costs revealed that the average total cost per episode was not related to type of provider, but there was a significant difference among providers in laboratory and medication costs. Faculty and PAs produced higher costs, especially for clients with negative outcomes. PAs achieved better outcomes than the faculty or the residents, even though they saw clients with the same type and degree of severity.

Kane, Olsen, and Castle (1978b) studied archival data on ten rural practices which trained and subsequently employed a physician assistant, and ten matched (specialty, number of physicians, and size of the community served) control practices which did not employ a physician assistant to determine changes in the volume of clients seen and revenues. For each pair of practices, data were collected on office client volume and finances that began two years prior to the entrance of the physician assistant through one to two years of his/her employment. Practice appointment records, income tax forms, and total practice receipts were used to determine client

volume and revenue. Results suggested that the practices that employed a physician assistant showed an increase in revenue and in net profit per physician. On average, the net profit increased $11,000 (22%) for the physicians with physician assistant, compared with $9,000 (21%) for the control physicians. Undoubtedly, there were differences between practices that chose to take on a PA and those that did not that were not controlled.

The Congressional Budget Office (LeRoy & Solkowitz, 1981) analyzed the performance of physician extenders (PE), their economic impact on medical practice, and policy options regarding their future role. They found that PE's tend to spend more time with their clients than physicians, but when considering salary differences, the hourly costs of PE's appeared to be about one-third to one-half of physicians. When medical services were provided by NPs, the cost was two-thirds to four-fifths of the cost of physician care; PAs provided care that cost about one-third to one-half of physician care. Training costs for the PA and NP were approximately one-fifth of medical school (Congressional Budget Office, 1979). Physician training between 1969 and 1978 ranged from $40,000 to $60,000 as compared to $10,000 to $20,000 for the PA during the same time frame.

In an era of cost-containment and capitation, the demand for physician assistants will increase. It is felt that they will be better positioned for advancement than other health professionals because of their positive financial impact in managed care environments (Weil & Miller, 1995). A survey completed in 1981 of 6,121 PAs had a 59% response rate. Results indicated even though PA salaries had kept pace with physician salaries, PAs continued to earn about one-fourth to one-third as much as physicians. Surprisingly, military and civilian salaries were essentially equivalent (Carter & Oliver, 1983). According to Scofield and Gull (1984), the primary care PA commanded a salary which was approximately 50% of a new physician.

In summary, manpower analyses have tended to focus more on the numbers and less on actual job content, flexibility, and development. Also, physicians can influence manpower decisions inappropriately, basing those decisions on individual rather than institutional needs. If non-physician manpower is to improve the health care system, then tasks rather than numbers must be studied, management must be given and take more authority for manpower decisions, and occupation isolationism and self-interest needs to be curtailed (Robbins, 1972).

Quality of Care

Assessments of quality of care include structure, process, or outcome measurements. The process of care is further divided into the technical and interpersonal manner in which care is provided. Most of the research done about the quality of care provided by physician assistants has centered around the process of care and, more specifically, measurements of the technical aspects of care.

Sox, Sox, and Tompkins (1973) evaluated records of 3,024 clients seen by physician assistants for appropriateness of treatment for eleven medical conditions. Upper respiratory illnesses, ear problems, and cough algorithms accounted for 50.6%, 9.4%, and 7.6% respectively of the care provided. Results indicated that PAs could have evaluated 45% of the clients accurately without consultation with a physician.

Komaroff et al. (1974) assigned clients with diabetes and hypertension to a group of physician assistants using problem-oriented protocols or to a control group of physicians. The PAs were able to manage 37% of the clients without a physician consult. Also, serum glucose was 8 mg less than the control group. Diastolic and systolic blood pressures revealed no differences of significance between the two groups. A limitation of the study was the fact that all clients had uniquely chronic conditions and the sample size of providers was not identified.

Nelson, Jacobs, and Johnson (1974) studied eighteen primary care practices in upper New England to determine client satisfaction with PAs. A total of 449 of 835 clients volunteered, for a response rate of 54%. A sample of 12% were interviewed to insure that the sample was representative of the respondents. The actual number of providers is unknown and severity or reason for visit were not controlled. Results indicated that clients rated PAs highly in terms of technical competence (89%), professional manner (86%), and reported improvements of care (71%). Access improved as well (79%) and 83% of the clients "definitely would" want the PA to participate in their care again. Patient age, social class, and access were significantly related to certain attitudes toward PAs.

Levine, Morlock, Mushlin, Shapiro, and Malitz (1976) studied two departments of a pre-paid group practice with ten physicians and 12 NP/PAs in regard to practice patterns and client-reported outcomes. The providers completed questionnaires for a random sample of 50% of their clients seen during a two-week period. The clients completed the questionnaire prior to the visit, one week later, and one month after the visit with a response rate of 87%, 81%, and 87% respectively. Results revealed that the NP/PAs provided 75% of the well-person care, 56% of the problem-oriented care, and 29% of the pediatric care. Thirty two percent of the NP/PA visits involved consultation with a physician. The NP/PAs solely managed the care of 69% of their adult medicine clients and 82% of their pediatric visits. The NP/PAs were more likely to manage clients with acute conditions or frequent or intense discomfort or pain. The physicians in this study were more likely to manage clients presenting with chronic conditions and undiagnosed problems at the time of the visit. A significant difference was found in outcomes: adult medicine clients seeing physicians experienced more anxiety regarding their problem than did those seeing the NP/PAs. Patient satisfaction levels were similar for all provider types.

Record, Hurtado, and O'Bannon (1977) chose four morbidities from their data base to test the performance of the PA on processes of care, outcomes, and client complaints. The

morbidities chosen were strep throat, coryza-upper respiratory infection, bursitis, and bronchitis due to their high frequency, PA treatability, definability, established diagnosis and treatment procedures, and measurable outcomes. Demographics, appointment type, co-morbidities, and diagnostic testing and treatments were reviewed. The vast majority of the 1,216 visits were one-visit episodes. Results indicated that there was very little distinction between physicians and PAs. However, PAs tended to practice more conservatively, relying somewhat more heavily upon diagnostics, especially laboratory tests. There was no evidence to suggest that PAs provided inferior service, but that the performance compared quite favorably with that of physicians. In addition, the average number of client complaints about a PA was only 58% of the average number of complaints about the physicians.

Kane, Olsen, and Castle (1976a) included the first three graduating classes of Utah physician assistant's and their physician preceptors in a study of the process and outcome of care in 13 primary care practices. The data included client contact records during and after the preceptorship and information solicited from clients regarding their primary reason for the visit and functional status. Patients with acute problems were followed up within two to six weeks for functional data. Severity of illness was controlled for and their was no significant difference in the types or severity of acute and chronic problems seen by the PA. Results indicated that the PA was more likely to use appropriate lab tests and less likely to use inappropriate treatments than the physician preceptors. Outcomes of care, in terms of functional status, were similar for both provider types. Limitations include the fact that the physician assistants were new graduates and the sample size of providers was unidentified.

Kane et al. (1978a) conducted a study to compare the outcomes of acute care episodes by different levels of family practice providers in a clinic setting. Acute care episodes totaling 1,761 in two family practice centers affiliated with a university family practice residency program were studied. The providers were 12 first-year, 14 second-year, and 11 third-year family practice residents, nine family practice faculty attending physicians, and two physician assistants. The outcomes of care were evaluated in terms of both functional status and client satisfaction. Results indicated that when the clients were viewed as a group, those clients treated by the physician assistant fared considerably better and those seen by a faculty member did worse. For each provider type, the proportion of clients satisfied with the care is greater than that for outcome. However, there was not any significant difference among the providers for client satisfaction. Also, there was no significant difference in terms of costs per episode of care by provider type or in the mean number of deficiencies in care for various diagnoses by provider type. Measurements of the psycho-social component of the illness or the client were not made. The study was also limited to acute conditions.

Simborg, Starfield, and Horn (1978) studied one general adult medical and one general pediatric clinic in each of the following facilities: Johns Hopkins Hospital, Columbia Medical Plan, and East Baltimore Medical Plan. Physicians and NP/PAs were studied to measure differences among practitioner types in the care of clients. A total of 1,369 client-provider encounters were examined. Results revealed that the highest rates of follow-up of all types of problems and therapies were found when the same practitioner saw the client at two successive visits to the same clinic. When a physician saw a client following a previous visit to a NP/PA, there was a significant drop-off in the follow-up rate of problems and therapies. This was true even when two different physicians saw the client on successive visits compared to two different NP/PAs. Improved recognition of problems by NP/PAs following physicians, while not significant, was due almost entirely to better recognition of signs and symptoms by the NP/PAs (71%) as compared with physicians (44%). Physicians responded much better to information generated by themselves or other physicians than to information generated by NP/PAs. It was concluded that the skills of the physician and NP/PA are potentially complementary, but this potential is not fully exploited, especially by physicians.

O'Hara-Devereaux (1979) measured ninety providers' (30 each of family practitioners, nurse practitioners, and physician assistants) abilities on medical and psychological tests indicating that each provider type performed equally well on both exams. Their medical clinical ability was within the expected range, but their performance on the psychological clinical ability was very low, in fact, just half the expected range.

Sox (1979) analyzed 21 studies that compared care given by NPs or PAs with care given by physicians. The author concluded that NPs and PAs were indistinguishable from physicians when providing office-based patient care. Caution was suggested in applying these results to care outside of the office, unsupervised care, or seriously ill clients.

Goldberg and Jolly (1980) evaluated the quality of care as part of the Air Force Demonstration Project where 23 PAs and seven NPs provided care in primary medicine clinics. They assembled the results of condition-specific quality-of-care criteria, reviewed differences in the pattern of ordering tests, procedures, and return visits, and analyzed the supervisory-consultative relationships between physicians and extenders. The sample consisted of 48 physicians, seven nurse practitioners, 23 physician assistants, and 18,053 client visits. Results indicated that PAs performed at least as well as physicians on 25 of 28 non-redundant process of care criteria, where NPs performed at least as well as physicians on 14 of 19 criteria. The differences between PA and NP performance were not significant. There was also no difference in ancillary use between the physician extenders and physicians.

Romeis, Schey, Marion, and Keith (1985) gathered client encounter data from two different settings. The NP/PA client encounters were obtained from a group of urban elderly

apartment residents who elected to use a satellite clinic in their building. The most significant variable predicting use of the NP/PA clinic was difficulty in arranging transportation. A control group of apartment residents who didn't use the clinic were randomly selected and interviewed relative to background, access to providers, and health status. A second control group of older adults was selected from the Family Practice Center, Bowman Gray School of Medicine. Over the 14 months of operation, 53 older adults from the apartment building (5%) enrolled and used the NP/PA clinic for a total of 474 clinic visits, or 8.9 visits per client. This was twice the average of the Family Practice Center, that had 4.22 visits per client. The results of a study found that a large amount of functional responsibility required by older adults could be delegated to NP/PAs. Results also revealed shorter hospitalizations, increased feelings of well-being, and high client satisfaction with care. The average cost per visit for the Family Practice Center was 31% more than the average NP/PA clinic visit. Also, hospitalization stays were 7.5 days for the experimental group and 9.5 days for the control group. Diagnostic categories for both groups were similar. The limitations of the study was an unstated number of providers and the type of non-physician providers utilized.

In an effort to provide a low-cost, high quality breast cancer screening program, Hillman et al. (1987) conducted a study in a HMO to determine if PAs could interpret mammograms under the supervision of the HMO radiologist. Six radiologists and four PAs interpreted the mammograms retrospectively. The six radiologists interpreted mammograms as part of their usual clinical responsibilities. None of the six were specialists in mammography. The PAs underwent five weeks of training in breast-cancer screening and mammogram interpretation. For each breast, the readers individually made decisions about whether cancer was present and the appropriate disposition. The providers interpreted 727 mammograms: 470 normal breasts, 75 breasts with benign breast masses, and 182 breasts with cancer. The four PAs achieved a mean sensitivity of 0.78 in detecting breast cancer. This was significantly higher than the physicians who achieved a mean sensitivity of 0.61. Another finding revealed that the interpretations by the PAs took less time and cost less. The fact that this was a test situation for the PAs, and that they were motivated as a result of the special training, needs to be taken into consideration when interpreting the results of this study.

Holmes (1991) reviewed differences of ancillary resource use among physician extenders, interns, and physicians. A random sample of 1,350 outpatient visits from the Army Ambulatory Care Data Base were analyzed. Reason-for-visit, age, sex, and disposition were controlled. Total ancillary resource use was similar for all of the provider types. Interns were found to order fewer prescriptions than physician extenders. However, there was significantly less x-ray ordering by the physicians than by the physician extenders. The sample size of all provider types was not identified.

Carzoli, Martinez-Cruz, Cuevas, Murphy, and Chiu (1994) compared patient care delivery by neonatal nurse practitioners and physician assistants with that of pediatric residents in the Intensive Care Unit. A sample of 244 consecutive admissions to the Neonatal Intensive Care Unit were included in the study and a retrospective chart review was used for data collection. Patients were cared for by one of two teams; one staffed by pediatric residents and the other by NPs or PAs. Patients were similar for each team as determined by client background and diagnostic characteristics. These characteristics included length of stay, mechanical ventilation, oxygen use, total parenteral nutrition use, number of transfusions, and various procedures required. Outcome variables included air leaks, broncho-pulmonary dysplasia, intra-ventricular hemorrhage, patent ductus arteriosus, necrotizing enterocolitis, retinopathy of prematurity, and mortality rate. Hospital and physician charges were also included as part of the outcome variables. Results revealed that there were no significant differences in management, outcome, or charge variables between the care provided by the two teams. The number of providers was small, (two residents, one neonatologist, seven NPs, and two PAs), neonatologist input was not controlled, and the study was retrospective in nature.

Lombness (1994) completed a retrospective chart audit of 105 randomly selected clients who had undergone elective coronary artery bypass surgery between 1991 and 1993. The clients were separated into two groups. Eight PAs cared for Group 1 and six clinical nurse specialists cared for Group 2. Cardiac surgeons provided coverage for both groups. Age was controlled. Results revealed that complication rates were similar, but the CNS-managed group had a statistically significant shorter length of stay. A limitation to the study may be the fact that all PAs left the institution to take other jobs following the study; dissatisfaction may have played a role. Also, the time periods for the two groups were different and the researcher was one of the six CNSs.

As early as 1974, an evaluation of the then current state of research revealed that the quality of care provided by the new practitioners was equivalent to that of the physician (Cohen et al., 1974). A work group from the U.S. Department of Health, Education, and Welfare concluded that there was sufficient NP/PA evidence available about client satisfaction, employer acceptance, and quality of care that these topics required no further study (Copley & Knauss, 1977). The Congressional Budget Office examined the current performance of physician extenders, their economic impact, and policy options regarding their future role. They also concluded that the medical care delivered by NP/PAs compared favorably with that delivered by their physician counterparts for those medical conditions within the appropriate scope of practice. In fact, they stated that practices that utilize NP/PA's may even provide better care than those practices without them (Congressional Budget Office, 1979). A few years later, the Office of Technology Assessment (OTA) concluded that the quality of care was similar for NP/PAs and physicians.

They also concluded that PAs perform better than physicians in supportive care and health promotion activities (OTA, 1986).

Studies have concluded that the care provided by physician assistants is of high quality. There is no question that monitors of quality for all providers should continue to be developed. However, any doubt about this particular provider's clinical capabilities are unfounded.

## Roles

Independence vs Dependence. It is ironic that we continue to battle the same health care issues that this country sought to address in the 1960s. There are mounting concerns about health care cost, access, specialization, and the need to return to primary care, complete with its emphasis on prevention, education, and counseling. Certainly, the physician assistant movement has helped to alleviate some of the crisis, but the profession may also contribute to the problems by its very role of dependence on physicians.

The scope of the PA role is a function of the physician's perception of the PAs skills and capabilities--a sociological model called "negotiated performance autonomy" (Record et al., 1980b). Stackhouse and Cheney (1984) described it as functioning as independently as possible within a dependent role. Sargent (1987) described it as "no man's land"; somewhere between independence and autonomy vs dependence on physicians for complete supervision. Physician receptivity to the role of the PA is partially determined by the potential threat that this role creates. Whether the services of the PA are perceived as role threatening or role elevating to the physician determines the extent to, and the manner in, which the PA is utilized (Record & Greenlick, 1975).

During the inception of the role of the PA, a great deal of controversy surrounded the issue of whether or not to pursue licensure. Licensure was seen as a requirement to specify tasks that PAs would be allowed by law to perform and these would vary from state to state. It was thought that licensure would, ultimately, decrease the flexibility of the employing physician (Cooper & Willig, 1971). Thus, it was decided that a PA should function in a dependent mode of action, placing the ultimate responsibility on the physician. This would create a flexible system and allow continued growth, both in the type of tasks performed and in the degree of responsibility. A dependent role, ironically, would be less restrictive (Pitcairn & Flahault, 1974). Physician dependence allowed PAs to assume large amounts of responsibility for patient care, but did not usurp the authority of physicians to direct and manage care provision (Cawley & Golden, 1983; Sadler, Sadler, & Bliss, 1972; Schafft & Cawley, 1987).

For the most part, acceptance by physicians of non-physician health care providers is based on a mutual understanding of the PAs dependent role (Fasser et al., 1984a). The focus of the PA's job is to reduce the physician's workload by performing those tasks that are delegated

(Beschle, 1994). The PA acts as an extension of the physician and not as a substitute (Bottom, 1987). The American College of Physicians Task Force on Physician Supply (1994) reiterated this sentiment by supporting the expanded role of NPs and PAs, as long as it was within a collaborative system that includes a physician who takes responsibility for the quality of care provided. The College could not support independent practice or direct fee-for-service payment without accountability until evidence demonstrates that high-quality care can be provided in independent practice arrangements. They did support expanded roles for NPs and PAs working in hospital and ambulatory settings as substitutes for the physician house staff. Wilson (1994) believed that increasing the number of independent providers would only serve to increase the cost and fragmentation of health care. Also, nurse practitioners and physician assistants are at their most cost-effective not when they substitute for physicians, but when they supplement them.

Physician assistants and several professional and government agencies embrace the role of the dependent practitioner. In June of 1993, the American Academy of Physician Assistants House of Delegates sent a letter to the American Medical Association reaffirming their role as dependent practitioners. Members of the profession are comfortable with their role working in a collegial and productive manner with physicians (Crane, 1994; Fischer, 1995; Manber, 1985). The AAPA (Hooker, 1991) and Office of Technology Assessment (1986) defined the PA as a member of the health care team who functions under the direction and supervision of a physician and provides a broad range of health care services. There is no pretense that the PA should function as an independent practitioner (Celentano, 1982; Huch, 1992; Lampert, 1990; Roy, 1984). Due to the complexity and importance of independence vs dependence in the PA role, a great deal of research about the role of the PA has been conducted over the 35 year history of the profession.

In 1973, the American Medical Association mail surveyed over 400 PAs presumed to be working in the health field and achieved a 71% response rate. The questionnaire was divided into three parts: general biographical and employment information, tasks performed and supervision received, and the level of responsibility awarded in managing common client problems. The results revealed that the PAs felt they could handle 24% of the cases independently, 28% of the clients would need mandatory consultation, 35% were referred to the physician after the basic history and ordering of lab tests, and 13% of the problems were referred immediately to the physician.

Braun, Howard, & Pondy (1973) conducted another study designed to test two aspects of the work of the PA: their use of skills and degree of independence. A sample of 11 physicians and 11 PAs participated in the study. A 368 item questionnaire was divided into six major task categories: history taking, physical exam, laboratory procedures, medical tasks, surgical tasks, and other medical tasks. Results of the survey revealed that the PA in private practice is no more

independent than the PA in an institution. The difference is in the actual number of tasks being performed, with the private practice PA performing many more tasks on a frequent basis than those PAs practicing in institutions. An obvious limitation of this study was the small sample size.

In 1977, Toffler initiated a study of NPs, PAs, and CNMs in Connecticut. The focus of the study was the specific activities performed and attitudes held by the practitioners of themselves and their job during their first six months post-training. The study also examined their supervisors' reports of the impact that the providers had on client load and time spent with the clients. Questionnaires were distributed by mail to 107 NPs, PAs, and CNMs and 66 returned their surveys. Fifty of the 66 supervisors contacted responded. Results indicated that 25% of the supervisors saw the providers as physician substitutes, 61% as complementary, and 14% as both. The major difference was among the NPs, PAs, and CNMs. The supervisors reported that NPs spent an average of one and one-half times as long as the other two groups per client visit. PAs performed procedures, particularly invasive procedures, requiring technical skill more than either the NPs or CNMs. General self-confidence was higher for PAs than NPs, but not at a significant level. The limitations of this study are its self-reporting nature, the fact that only new graduates were sampled, and tool reliability/validity was not reported.

Crandall, Santulli, Radelet, Kilpatrick, and Lewis (1984) conducted a self-report study of 2,456 office encounters with physicians and/or PAs in 16 primary care, private practices in Florida, revealing that PAs were most likely to see clients that were male, younger than 65 years old, new clients seeking help for acute problems, and those who were walk-in. Physicians performed 50% of client services, while 35% were performed solely by the PA, and 15% by both providers. PA encounters requiring consultation with the physician composed 30% of the visits. In summary, PAs did not function as physician substitutes in the sense that they autonomously cared for a panel of clients. The limitations of this study were that no data were collected to determine the precise mechanism for triage to a physician or PA, self-reporting methodology, and limited duration of the study period (one week).

Physician Acceptance. Other professionals' perceptions of the role of the PA have also been studied. Coye and Hansen (1969) surveyed practicing physicians in Wisconsin to determine attitudes toward the concept of "doctor's assistants" and the roles these assistants could fill in their practices. Surveys were sent to 4,000 members of the Wisconsin State Medical Society and 32% of the physicians responded. Sixty one percent of the respondents felt that assistants are needed; 42% stated that they would use an assistant in their practice. A majority of the physicians agreed that assistants should be excluded from the following responsibilities: performing physical exams, doing emergency room procedures, giving anesthetics, providing post-operative care, performing deliveries, and providing prenatal and well-baby care. When the

proposed duties were closely related to the specialty skill of the responding group, the response tended to be strongly negative, except for well-baby care; 25% of the pediatricians thought it could be delegated. Limitations of the study include the poor response rate and lack of reliability/validity testing of the questionnaire.

McCormack et al., (1971) found that physicians overwhelmingly favored employing nurse practitioners over physician assistants. A sample of 113 potential physician participants were personally interviewed or were mailed a survey; 104 physicians participated in the study. Fifty percent were willing to hire such a person immediately or to consider it seriously when the present assistant left. Almost 40% of the respondents declared that they would never hire a nurse practitioner or physician assistant; pediatricians displayed slightly more interest than other physician types.

Using a delphi technique, a panel of experts was asked to make judgments on the role and basic functions of the PA in Oregon. A total of three questionnaires were utilized. Results showed that there was general consensus that the roles of the health care team should be interwoven and the responsibility for patient care be shared. Consensus was not reached regarding the PA functioning as the primary care provider, where the PA first sees the client and then consults with the physician. The most significant differences among the expert panel members were between the responses of the nurses and PAs (Travis & Ellis, 1974).

Youtsey and Bock (1975) conducted a study to determine the impressions of practicing physicians in Indiana about the roles, acceptance, and utilization of PAs. A ten percent random sample was selected for the study and questionnaires were mailed to 451 physicians. 225 questionnaires were returned for a response rate of 51.3%. Results revealed that physicians, as a group, agreed with the basic philosophy of the physician assistant concept. However, only 25% of the physicians thought that PAs should be legally responsible for his/her performance. They also felt that the quality of care would improve with greater utilization of physician assistants.

Fellars, Cown, Tworek, & Campbell's (1976) primary purpose was to identify the attitudes that primary care physicians practicing in the state of Illinois had toward PAs. A modified random sampling technique was used to select the samples of general practitioners, family practitioners, and internists. The sample included 1,838 physicians for analysis. Illinois primary care physicians indicated fairly divided attitudes toward hiring PAs for their practices. Nearly 80% of them, however, favored permitting PAs to assume at least some degree of responsibility for the performance of many medical and surgical procedures. Physicians most positive toward hiring PAs were those in large multi-specialty groups. Most physicians felt that the use of a PA would increase their medical liability.

Fottler (1979) conducted a survey in 1975 of physicians to determine physician attitudes toward employment and task delegation to nurse practitioners, coupled this with one other similar

study, and compared these results to two studies of attitudes toward PAs. Results indicated that physicians are more willing to employ and delegate tasks to a PA. Fifty nine percent of the physicians surveyed indicated that they were willing to employ a PA as compared to only 33% who would employ a nurse practitioner. Eighty seven percent of the physicians were willing to delegate certain activities to a PA compared to 48% who were willing to delegate such activities to a NP. However, physicians that had experience with NPs appeared to have more favorable perceptions of them than physicians that had no experience with NPs. Physicians in primary care tend to be more favorable to NPs and PAs than were specialist physicians. Limitations of this study include the fact that the four studies were not done simultaneously. Three of the studies lacked statistical controls and could bias the results. Also, these studies only dealt with the physician willingness to employ and delegate tasks, rather than actual employment or task delegation behaviors.

Cherkin (1980) conducted a survey of primary care physicians (73% response rate) in Washington State to determine the familiarity with and, perceptions of, nurse practitioners and physician assistants. Results indicated that familiarity is not a major impediment to the demand for NPs and PAs, and that this provider type would have a neutral or positive impact on most aspects of their practices. However, 50% of the physicians sampled preferred working with other physicians, compared with 7% choosing an NP/PA as a first choice when adding a partner to the practice. More than 70% expressed "some" or "great" concern about client acceptance, administrative and reimbursement problems, and increases in the cost of malpractice insurance.

Ferraro and Southerland (1989) revealed that physicians perceived the role of the nurse practitioner and physician assistant as useful, but limited. Two separate samples involved interviewing 1,621 physicians for 45 minutes each (one nationwide cross-section of 1,430 physicians and 191 physicians practicing in HMOs and Individual Practice Arrangements (IPA). Physicians' beliefs that physician extenders can improve the quality of care is dependent on the clientele and on the relative position of these occupational groups in the hierarchy of medical care workers.

Shi, Samuels, Ricketts, and Konrad (1994) studied the employment of nurse practitioners and physician assistants in both urban community and migrant health centers. The factors associated with their employment was based on a 1991 national survey of 515 centers. A sample of 383 centers completed the survey, for a 74% response rate. Results suggest that NPs and certified nurse midwives, serve primarily as physician substitutes and are more likely to be employed by centers that are large and have affiliations with advanced nurse practitioner and physician assistant training programs. One hypothesis was that the number of physicians in the center is inversely proportional to the number of NPs and PAs employed. This inverse

relationship was significant for all but the PA model. This may be due to the fact that PAs were more likely to work under the supervision of physicians.

Client Acceptance. Conant, Robertson, Kosa, and Alpert (1971) studied the nature and degree of clients' possible acceptance of nurses and PAs in the tasks normally carried out by physicians. Two suburban Boston communities were identified and matched in terms of the lack of a community hospital, availability of physicians, and population size using 1960 census data. A random sample of 120 households in each community was drawn. Personal interviews with the female head of the household were conducted. The upper middle class community (105 households) and lower middle and working class community (89 households) were interviewed. The results revealed a considerable difference in acceptability between an upper middle class community and a lower middle and working class community. The upper middle class community more readily accepted their physician's use of assistants and nurses than did the lower middle and working class community. The lower classes, the group more likely to receive such care, expressed the lower degree of acceptance.

Litman (1972) studied a sample of 253 Southern Minnesota and Northern Iowa households which were served by community hospitals were selected and interviewed in 1970. A 100% response rate was achieved. On the whole, while there seemed to be a warm response to the notion of a PA in general, there was far less agreement over the specific duties such personnel should be permitted to perform. There remained some lack of confidence in the training, experience, and ability possessed by the PA.

In 1992, Mainous, Bertolino, and Harrell conducted a study to determine the proportion of adults who had received health care from physician extenders. A survey of all households in Kentucky was conducted using random digit telephone dialing. Of the 687 participants, 25% had received care from physician extenders during the previous two years. More than 90% reported satisfaction with the care received. The limitations of this survey includes the fact that individuals were eliminated that did not own telephones, data were self-reported and could not be validated, and there was a 68% response rate.

Storms and Fox (1979) studied public attitudes toward PAs and NPs and found that the public regards the two groups of health care providers similarly. A stratified sampling technique was utilized to obtain a sample of households with listed telephones. The response rate was 78%. A telephone survey of 2,583 households in Baltimore, Maryland indicated that about half the population had heard of a PA or NP, though only 4% reported receiving care from such providers. About one-third of the sample accepted the performance of all tasks, and only a small proportion rejected all tasks performed by PAs and NPs. The respondents accepted the principle that important medical care functions can be delegated, as long as the PA or NP were considered

assistant to the physician. There were three distinctions: NPs were more likely to be viewed as women; NPs were perceived as being in more practice settings than PAs; and NPs were thought to have more education than PAs.

Issues

The Office of Technology Assessment (1986) revealed that several obstacles exist for non-physician providers. They include physician resistance, legal restrictions, inaccessibility, cost and limitations of malpractice insurance, and payment for interpersonal and preventive care. Uneven state medical practice laws governing PAs create other barriers (Cawley, 1985). These obstacles continue to limit the realization of the full potential that these providers can offer the health care consumer.

Prescribing Authority. As recently as 1994, the American College of Physicians stated that nurse practitioners and physician assistants should be empowered to dispense prescription drugs in a system that ensures accountability to a physician. Of the 29,000 PAs across the United States, 90% prescribe without any physician co-signature (Mittman, 1995).

Reimbursement. Some improvements have been made in third-party reimbursement in the foregoing years, but significant issues remain. "No major health care industry exists that is sufficiently free from explicit or implicit regulation and licensing to allow the unhindered play of market forces to bring about significant employment of physician extenders" (Zeckhauser & Eliastam, 1973, p. 96).

GMENAC (1980) recommended that third party reimbursement be made to the employing institution or the physician. However, a definite correlation was discovered between state policies on reimbursement and legal constraints regarding the distribution of NP/PAs (Weston, 1980). Not surprising, the AAPA feels that it is essential that all insurers cover services provided by PAs in all practice settings (AAPA Council on Professional Practice, 1990).

The Physician Payment Review Commission (1994a) conducted a survey in 1993 to determine problems and solutions with the current reimbursement system. They specifically wanted to determine whether the current payment policies were fostering or impeding the use of NP/PAs. They found that several states have expanded the coverage of care provided by NP/PAs beyond the federal mandates up to the limits of the appropriate professional practice act. Some programs' payment policies were more restrictive than the practice acts, especially for PAs. The reason for this was not concerns about quality, but budgetary issues; some states could not afford the improvement in access.

Scope of Practice. The Physician Payment Review Commission (1994b) proposed that the scope of practice be expanded for NP/PAs and that the coverage and payment policy be extended. They also recommended that model state practice acts be established to set minimum standards for NP/PAs that encourage practice styles and collaboration with physicians that would enhance client outcomes.

Unfortunately, the regulation of the practice of the PA varies greatly from state to state. AAPA Council on Professional Practice (1990) expressed concern that any law governing the practice of PAs not impose requirements for physician supervision beyond those needed to ensure quality of care. Connell felt that delegatory laws have evolved into regulatory laws. Regulatory laws tend to be more specific and contain requirements for licensure, registration, supervision, conditions of employment, and approval of educational programs (Connell, 1992; Fasser et al., 1984a). This transition may defeat the purpose of the generalizability of the PAs ability to practice in all settings.

"Individual successes or failures utilizing NP/PAs are primarily based on the medical, cultural, and economic systems of the countries that utilize them. In the U.S.' largely entrepreneurial medical delivery system, the viability of PAs and NPs may be determined less by their clinical competence and capabilities to expand client services than by their economic impact on physicians' practices. The innovation to create NP/PAs as primary care providers in the U.S. has so far been only partially successful, due largely to the constraints and inconsistencies placed on their utilization in our medical care system (Cawley & Golden, 1983, p. 82)."

Major Findings

The literature reveals that physician assistants provide quality care. PAs provide equivalent and high quality care as compared to other providers (Goldberg & Jolly, 1980; Kane et al., 1976a; Komaroff et al., 1974; Simborg et al, 1978; Sox, 1979). They are also capable of treating 83% of presenting problems (Buchanan & Hosek, 1983; Bureau of Health Manpower, 1976; Hosek & Roll, 1979; Miles & Rushing, 1976).

In spite of the fact that PAs consult with physicians for 5-20% of their clients (Ekwo et al., 1979b; Record et al., 1977), it is reported that they provide care at a cost savings to a practice. More clients are seen when a PA is added to a practice, thus improving productivity (Golladay, et al., 1973; Lasdon, et al., 1974; Mendenhall, 1978; Nelson et al., 1974; Nelson et al., 1975b; Olsen et al., 1978; Smith et al., 1971). However, this is dependent on the willingness and the ability of the physician to delegate tasks to the PA (Litman, 1972; Nelson et al., 1975a). Also, Mendenhall (1978) and Scheffler (1979) found that PAs were more productive than NPs.

Major Limitations

The majority of research on physician assistants was done over 20 years ago, at the inception of the profession (Duttera & Harlan, 1978; Jacobs et al., 1974; Kane et al., 1976b; Lairson et al., 1974). Health care provision and the role of the PA has certainly changed in that time frame. Also, the studies focused on the technical nature of practice (Borland et al., 1972; Breslau & Novack, 1979; Ekwo et al., 1979b; Glenn & Goldman, 1976b; Jacobs et al., 1974; Knickman et al., 1992; Larson et al., 1994; Lasdon et al., 1974; Nelson et al., 1975a; O'Bannon et al., 1978; Parker & Delahunt, 1972; Physician Payment Review Commission, 1994b; Repicky et al., 1980; Smith et al., 1971). Little was accomplished in the realm of measuring outcomes of care based on any interpersonal aspects of the process of care.

Sample sizes and experience levels of the providers were significant limitations of the literature. Most of the studies reported on single sites and included only the few providers in the practice (Braun et al., 1973; Carzoli et al., 1994; Coye & Hansen, 1969; Jacobs et al., 1974; Johnson et al., 1985; Lairson et al., 1974). Due to the fact that the studies were conducted in the 70s, PAs were novices in their new role (Jacobs et al., 1974; Kane et al., 1976b; Lasdon et al., 1974; Morris & Smith, 1977; Steinwachs et al., 1976; Toffler, 1977).

## Results

Characteristics of Providers

The objective of this portion of the data analysis was to describe characteristics of the sample of providers. Descriptions of the basic demographic characteristics of the sample are provided in Chapters 1 and 9. For these analyses, providers were divided into three groups on the basis of their professional credential (physician, nurse practitioner, physician assistant).

Experience. Groups of providers were compared on each of four variables: years experience in a health care occupation, years experience as a provider in a military medical facility, years experience as a provider in a civilian medical facility, and years experience in the current clinic. Although differences among provider types in average level of experience were not large (see Chapters 1 and 9), there were some noteworthy differences in the distribution of experience. Nurse practitioners and physician assistants in the study had substantially more experience working in health care settings than physicians. Fifty percent of the physicians had less than ten years experience, while only 16% of the nurse practitioners and 15% of the physician assistants had less than ten years experience. However, nurse practitioners and physician assistants had substantially less experience serving as primary care providers in a military clinic than did physicians. Less than 20% of the physicians had less than four years

experience, while almost 50% of the nurse practitioners and over 50% of the physician assistants had less than four years. While only a few of the providers had significant experience as providers in civilian clinics, almost 33% of the physicians and almost 40% of the physician assistants had more than one year, while less than 20% of the nurse practitioners had over a year. Surprisingly, the majority of providers had a year or less experience in their current clinic. Less than 15% of the providers had more than two years experience in their clinic (see Chapter 9 for a discussion of turnover rates).

A one-way analysis of variance was used to determine whether differences among the *means* of the three groups of providers were statistically significant. Groups were not significantly different on any of the four variables. A Fisher's exact test was computed on frequencies in a 3 x 3 contingency table, Provider Type (MD, NP, PA) by level of experience (low, medium, high) to decide whether differences in *distribution* of experience across the three groups were statistically significant. Groups were not significantly different on any of the four variables.

Utilization. Groups of providers were compared on each of seven variables: beneficiary category of their clients, average severity of the client's presenting symptoms, client's primary reason for visiting the clinic, client's primary comorbid condition, number of clinic visits during the six months of the study, client's total income, and client's educational level. It is clear from Tables 2-1 to 2-7, that each of the three types of providers saw the entire range of clients (when data were collapsed across different types of clinics).

**Table 2-1**

**Distribution of Clients by Beneficiary Category**

| Provider Type | Active Duty | Family of Active Duty | Retired | Family of Retired |
|---|---|---|---|---|
| **MD** | 12% | 32% | 24% | 33% |
| **NP** | 20% | 56% | 7% | 17% |
| **PA** | 45% | 37% | 13% | 5% |

A chi square test of independence indicated that differences among provider types were statistically significant, $\chi^2$ (6) = 39.52, $p$ = 0.001.

**Table 2-2**

**Distribution of Clients by Severity Category**

| Provider Type | Low Severity | Medium Severity | High Severity |
|---|---|---|---|
| **MD** | 34% | 41% | 25% |
| **NP** | 44% | 34% | 21% |
| **PA** | 21% | 45% | 34% |

A chi square test of independence indicated that differences among provider types were not statistically significant.

**Table 2-3**

**Distribution of Clients by Primary Reason for Visit**

| Provider Type | Prev Med | Upper Resp | Musc | Back Pain | Gyn | Skin | GI | HTN | All Other |
|---|---|---|---|---|---|---|---|---|---|
| MD | 24% | 17% | 15% | 5% | 5% | 4% | 4% | 6% | 20% |
| NP | 33% | 20% | 7% | 6% | 3% | 7% | 7% | 3% | 14% |
| PA | 18% | 18% | 21% | 13% | 3% | 8% | 5% | 3% | 11% |

The statistical significance of differences among provider types could not be analyzed due to the small cell sizes (expected frequencies).

**Prev Med** = preventive medicine procedures, such as pap smear or prostate examination.
**Upper Resp** = upper respiratory conditions, such as cold, flu, or asthma.
**Musc** = musculoskeletal conditions, such as strains, sprains, or fractures.
**Back Pain** = back pain.
**Gyn** = gynecological conditions, such as infection or contraception.
**Skin** = skin conditions, such as rashes or insect bites.
**GI** = gastrointestinal upset, such as nausea, vomiting, or diarrhea.
**HTN** = hypertension.
**All Other** = all other symptoms combined.

**Table 2-4**

**Distribution of Clients by Primary Comorbid Condition**

| Provider Type | None | HTN | Back Pain | Musc | GI | All Other |
|---|---|---|---|---|---|---|
| MD | 27% | 19% | 11% | 9% | 6% | 27% |
| NP | 34% | 16% | 10% | 10% | 9% | 21% |
| PA | 18% | 18% | 16% | 8% | 5% | 34% |

The statistical significance of differences among provider types could not be analyzed due to the small cell sizes (expected frequencies).

**None** = no comorbidity.
**HTN** = hypertension.
**Back Pain** = back pain.
**Musc** = musculoskeletal conditions, such as strains, sprains, or fractures.
**GI** = gastrointestinal upset, such as nausea, vomiting, or diarrhea.
**All Other** = all other symptoms combined.

**Table 2-5**

**Distribution of Clients by Number of Clinic Visits in Six Months**

| Provider Type | 1 | 2 | 3 | 4 to 10 |
|---|---|---|---|---|
| MD | 48% | 19% | 18% | 16% |
| NP | 33% | 20% | 20% | 27% |
| PA | 41% | 18% | 23% | 18% |

A chi square test of independence indicated that differences among provider types were not statistically significant.

**Table 2-6**

**Distribution of Clients by Total Income Level**

| Provider Type | less than $21,000 | $21,000 to $40,000 | $41,000 to $60,000 | $61,000 to $80,000 | more than $80,000 |
|---|---|---|---|---|---|
| MD | 11% | 38% | 22% | 19% | 11% |
| NP | 19% | 43% | 22% | 6% | 10% |
| PA | 18% | 37% | 24% | 16% | 8% |

A chi square test of independence indicated that differences among provider types were not statistically significant.

**Table 2-7**

**Distribution of Clients by Educational Level**

| Provider Type | less than or high school | some college | some college with certificate | two year college degree | four year college degree | graduate degree |
|---|---|---|---|---|---|---|
| MD | 25% | 18% | 8% | 9% | 25% | 14% |
| NP | 20% | 36% | 10% | 10% | 19% | 6% |
| PA | 21% | 32% | 8% | 16% | 16% | 8% |

A chi square test of independence indicated that differences among provider types were not statistically significant.

Characteristics of Practice Model and Confidence Variables

The objective of this portion of the data analysis was to describe the nature of the data collected on the providers' attitudes about practice models and their confidence in their skills as a health care provider. These two attributes were assessed using modified versions of questionnaires developed by Thibodeau and Hawkins (1994).

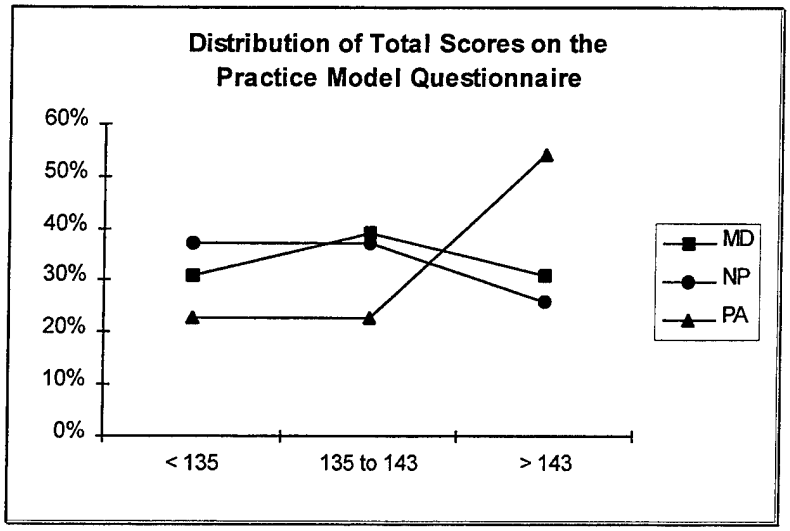
Practice Model. Thibodeau and Hawkins (1994) conceptualized practice model for nurses as a set of opposing orientations, one "medical" and the other "nursing." Their questionnaire was designed so that the different orientations were clearly defined in a single variable. Low scores indicated a medical orientation and high scores indicated a nursing orientation. However, in the current study, the questionnaire was modified to permit a comparison of the practice models of three different types of primary care providers (see Chapter 9). Analysis of the reliability and validity of the modified practice model questionnaire made it clear that the primary care provider's practice model is more complex than a single medical-nursing continuum. The changes made to the questionnaire combined with its administration to primary care providers of all types highlighted the broader concerns of the primary care provider -- concerns which encompass not only technical skills and holistic values, but also issues of mentoring, autonomy, and quality assurance. Furthermore, items which form the core of a traditional medical model (Thibodeau & Hawkins, 1994) did not account for a significant amount of variance in the total scores on the

questionnaire (see Chapter 9). If provider data are artificially categorized into a medical or nursing model, there are significant differences among provider types. Physicians are more likely to score high on the traditional medical model, while nurse practitioners are more likely to score high on the traditional nursing model. However, physician assistants have a more flexible or versatile style than either of the other two groups of providers (Mark, Mays, & Byers, 1996).

Frequency analysis of items on the practice model questionnaire (see Appendix A) revealed good agreement among providers about what constitutes a primary care provider's philosophy. Over 80% of providers rated item 3, "health is the harmony of the mind, body, and spirit" as "true most of the time" or "always true." Similarly, less than 16% of providers rated item 9 "health is the absence of abnormalities" and item 16 "the goal of health care is to cure illness" as "true most of the time" or "always true." There was also good agreement that collaboration, differential diagnosis, and quality assurance were key components of the provider role (items 8, 31, and 43). At least 80% of providers rated these items as "true most of the time" or "always true." Finally, there was good agreement that physicians should participate in the education of both nurse practitioners and physician assistants (items 25, and 26). Over 80% of providers rated those items "true most of the time" or "always true." Similarly, less than 16% of providers rated items 15 "education for nurse practitioners should be in schools of nursing" and 18 "nurse practitioners learn best from nurse preceptors" as "true most of the time" or "always true. The least agreement was seen on items concerned with "teaching is the primary component of the provider role," "leadership is central to the provider role," and "nurse practitioners are physician extenders." Providers were essentially equally divided among the ratings on these items (32, 39, and 4, respectively).

Total scores on the practice model questionnaire ranged from 108 to 183. A score above 143 indicated a belief in a broadly focused practice model, which included wellness, health teaching, client advocacy, collaboration, and research. A score of less than 135 was associated with low ratings on (i.e., disagreement with) items that suggested that client management strategies should stem from a practice model, the provider's practice model should dictate the kinds of data collected from clients, research should be applied in practice, and all providers should be responsible for monitoring the quality assurance of their practice. Figure 2-1 illustrates the distribution of scores on the practice model variable. Mean total scores on the practice model questionnaire were 139.31, 139.68, and 147.92 for MDs, NPs, and PAs, respectively. A one-way analysis of variance was used to determine whether mean differences among the three groups of providers were statistically significant. Groups were not significantly different.

**Figure 2-1**



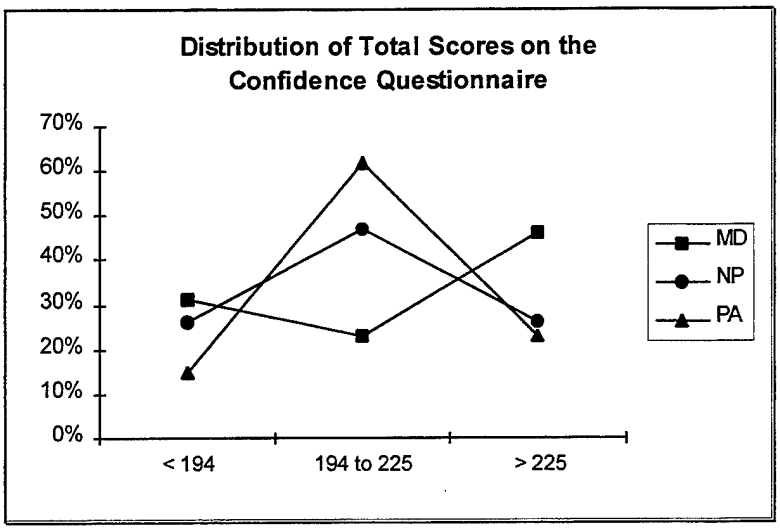

Confidence. The confidence questionnaire developed by Thibodeau and Hawkins (1994) measured nursing skills in three categories: medical tasks, nurse practitioner tasks, and indirect/administrative tasks. An analysis of the content validity and the factor structure of the modified questionnaire used in this study suggested that items could be sorted into three categories: medical tasks, provider tasks, and professional tasks (see Chapter 9). These categories, while quite similar to those of Thibodeau and Hawkins (1994), were congruent with the broader primary care provider's role.

Frequency analysis of items on the confidence questionnaire (see Appendix A) revealed that there was only one area in which 80% or more of the providers considered themselves to have "above average" or "far above average" skills. Item 1 "know the difference between subjective and objective data," was rated "above average" or "far above average" by 90% of the providers. There were nine items on which 60% or more of the providers rated their skills as "average" or less. These items (19, 31, 52, 53, 55, 57, 59, 62, and 64) were concerned with a variety of skills from simple technical skills to sophisticated analysis skills. There were eight skills which were rated as "not applicable" by 10% to 21% of the providers. These items (27, 44, 48, 49, 51, 54, 59, and 60) were concerned with finances and the use of theory in clinical practice.

Total scores on the confidence questionnaire ranged from 135 to 313. A score above 225 indicated that the provider believed his/her ability to be "above average" on the majority of skills in the 64 item list, while a score of less than 194 indicated that the provider believed his/her ability to be "average" on the majority of skills. Figure 2-2 illustrates the distribution of scores on the confidence variable. Mean total scores on the confidence questionnaire were 218.35, 224.63, and 214.92 for MDs, NPs, and PAs, respectively. A one-way analysis of variance was used to

determine whether mean differences among the three groups of providers were statistically significant. Groups were not significantly different.

**Figure 2-2**




Intercorrelations of Practice Style Variables

The objective of this portion of the data analysis was to quantify the relationships among practice style variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 2-8 provides the intercorrelation matrix of these variables. It is clear from the data in Table 2-8 that there was a good deal of overlap among the practice style variables. Scores on the practice model and confidence questionnaires had a moderate positive correlation. This result is congruent with that reported by Thibodeau and Hawkins (1994), who suggested that nurses who endorsed a holistic model of practice would experience less role conflict and would be more confident. There was a strong positive correlation between practice model scores and information giving scores. This result is not surprising either; a holistic model of practice presupposes that the provider must engage the client in order to promote an understanding of the psycho-social and physiological aspects of health and wellness. Finally, there was a strong positive correlation between confidence and autonomy scores. The provider who was low on one tended to be low on the other, while the provider who was high on one tended to be high on the other. This finding was somewhat surprising given that in many Army settings, including healthcare settings, inexperienced, less confident members are routinely provided high levels of responsibility and autonomy. Anecdotal evidence gathered during the course of this study suggested that two factors combined to make the primary care setting different. First, individual providers were encouraged to develop practice templates which limited the types of health problems that they would see. Second, management policies put clear limits

on provider autonomy (e.g., policies formally defining scope of practice, participating in preceptor programs, and obtaining local credentials). Thus, the correlation of confidence and autonomy is predictable in this setting.

**Table 2-8**

**Intercorrelation Matrix of Practice Style Variables**

| N = 58 | Practice Model | Confidence | Autonomy | Collaboration | Information Giving | Job Satisfaction |
|---|---|---|---|---|---|---|
| Practice Model | 1.00 | | | | | |
| Confidence | 0.38 | 1.00 | | | | |
| Autonomy | 0.35 | 0.41 | 1.00 | | | |
| Collaboration | 0.32 | 0.25 | 0.56 | 1.00 | | |
| Information Giving | 0.41 | 0.36 | 0.52 | 0.43 | 1.00 | |
| Job Satisfaction | 0.28 | 0.23 | 0.54 | 0.45 | 0.30 | 1.00 |

The analyses presented in this chapter formed the basis for an understanding of how practice model and confidence were viewed in the provider sampled. Chapters 6, 7, and 8 describe the results of analyses of the impact of provider practice styles on client outcomes.

## Conclusions

(1) The majority of providers of all three types, espoused a holistic practice model and rejected basic components of the traditional medical model.

(2) An analysis of utilization data indicated that utilization was a function of clinic type, not provider type. All three types of providers saw clients from all beneficiary categories, income levels, educational backgrounds, levels of severity of illness/injury, and levels of comorbidity.

(3) The practice model of these primary care providers was broader than anticipated, encompassing not only holistic values, but also issues of mentoring, autonomy, and quality assurance. This finding points to the importance of doing comparative studies which include all three types of primary care providers, a factor which makes this study unique.

(4) Providers who scored low on the practice model questionnaire did not disagree with what constituted a primary care practice model, but disagreed with the degree to which any practice model should influence direct patient care methods.

(5) In spite of the differences in educational and military service backgrounds, there were no significant differences in experience levels among the three types of providers. This finding is

an indication of (a) the diversity of experience within each provider type group and (b) the standards of competency used to assign providers to independent practice roles.

(6) Self-reported levels of confidence in skills indicated that the majority of all three types of providers saw themselves as capable of performing a broad range of skills, rather than having special expertise in specific areas.

(7) Congruent with the results of previous research, confidence scores were positively correlated with practice model scores and with autonomy scores.

(8) Practice model scores were also positively correlated with information giving scores. Although this relationship has not been investigated before, the result was not surprising given that the holistic model of practice espoused by the majority of providers dictates a need to exchange information with the client to promote an understanding of health and wellness.

(9) Genuine continuity of care was impossible given the turnover rates of all types of providers, clinic chiefs, head nurses, and clinic administrators.

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## CHAPTER 3
## AUTONOMY

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## Introduction

Autonomy is a multi-faceted concept that requires examination from several perspectives. Developmental and psychological viewpoints describe autonomy as an individual characteristic. Political, organizational, and sociological perspectives represent autonomy as responsibility and accountability to others. Whether conceptualized individually or socially, autonomy has the capacity to be a powerful determinant of how professionals perform and what outcomes they achieve. This is especially of interest in the provision of health care.

The Primary Care Demonstration Project is unique in that it examines the differences among all three primary care provider types: physicians, nurse practitioners, and physician assistants. Each provider type has a distinct scope of practice by law and educational preparation and, thus, varying amounts of autonomy in practice. Also, specific clinics grant various degrees of autonomy to providers based on factors unique to the situation. Experience, education, client population, tradition, rank structure, and the availability of support staff may influence the decision of clinic chiefs when they grant autonomy to the various provider types. The purpose of studying autonomy was to determine whether there were differences among provider types and to ascertain if their perceived level of autonomy influenced client outcomes.

Autonomy is the most cherished value of Western civilization (Thomasma, 1984). In health care, it is a critical element of provider practice style. Autonomy is an individual characteristic influenced by personality, beliefs, and the professionalization process. It impacts on providers' view of their role with clients and peers. Also, the organizational structure in which providers work impacts on their degree of autonomy.

Dempster (1990) viewed autonomy from several perspectives. She categorized it into developmental, ethical, organizational, philosophical, political, psychological, and sociological components. The literature on autonomy will be reviewed, accordingly.

## Literature Review

### Developmental Perspective

Autonomy, in its most literal sense, is a critical part of normal human development. Erikson (1963) proposed that the resolution between autonomy versus shame and doubt was one of the ego's basic tasks. Children in the second and third years of life gain control of their physical capabilities and language. This resolution of autonomy versus shame and doubt instills in the child a sense of personal trust and trust in others. If unresolved, shame and doubt encourage a belief in powerlessness and incompetence (Crain, 1985). Erikson (1963) was concerned about a balance between autonomy and protecting the child from harm.

Maslow (1965 & 1968) coined the term self-actualization to describe the outcome of autonomy in the workplace. He saw it as the ability of people to rise above basic human needs for safety, belonging, love, respect, and self-esteem to reach the pinnacle of personal success. He proposed that self-actualized people are those who assimilate work into their identity. He believed that self-actualization would turn uncreativity into creativity, unintelligence into intelligence, selfishness into unselfishness, and permit limited thinking to be eternal and cosmic. This concept was proposed as the key to proper management which would improve the lives of employees.

Differences in socialization, identity formation, the legal system, decision-making, and stereotypes that are applied to women contribute to differences in autonomy development . (Schutzenhofer, 1983 & 1988). Boughn (1988) conducted a study to determine whether or not female nursing students were as autonomous as females studying traditional and nontraditional female occupations. The sample included 1,046 undergraduate female students enrolled in bachelor degree programs at a state college. Results revealed that nursing and education students received the lowest scores on autonomy and masculinity and the highest scores on femininity compared to other students. No significant correlation was found among the variables of parent's occupation, grade point averages, Scholastic Achievement Test scores and femininity or autonomy scores. A strong correlation existed between masculinity and autonomy scores, though.

## Ethical Perspective

Autonomy. Major ethical principles include autonomy, beneficence, and justice (Beauchamp & Walters, 1982). The word autonomy comes from the Greek term "autos" meaning self, and "nomos" meaning rule or governance. It is basically the freedom to make choices without external control. Varying amounts of independence, self-governance, empowerment, actualization, and valuation are required for autonomous performance (Beauchamp & Childress, 1983; Dempster, 1994).

Haworth (1986) believed that the autonomous person is not overly dependent on others and is not easily overwhelmed by passion. He proposed that man is distinguished from other creatures by his need to grow and identified this tendency as competence. A person strives to become able and to expand the repertoire of skills; competence is the foundation of autonomy. Pellegrino (1994) felt that because humans have the capacity to make rational judgments about their own lives, autonomy has achieved the status of a moral right. Unfortunately, used in this way, autonomy can have a negative connotation, one that puts the right of self-determination ahead of other values. As the more negative concept of non-interference, autonomy can be self-

defeating for clients and self-serving for providers. On a more positive note, autonomy also implies an obligation to foster self-determination and to remove any obstacles to its full development. Similarly, it should be made clear that mastery of all circumstances is not a prerequisite of autonomy. The autonomous person must know the limits of his/her situation, knowledge, and capabilities. Thus, truly autonomous decision-makers interact with external circumstances by choosing freely and accepting responsibility (Collopy, 1988).

Beneficence. Ethicists have argued that in order to act morally, individual actions must be under the control of a moral norm that defines what is good. To act in accordance with such a norm requires individual autonomy (Bishop & Scudder, 1987).

Respect for others is a basic principal of autonomy. Human beings have incalculable worth and should be treated accordingly. This would include allowing others the freedom to form their own judgments and behave in the way they choose (within other moral limits). Those that truly possess moral dignity determine their own destiny (Beauchamp & Walters, 1982). However, a balance must be achieved between the respect for others, or beneficent actions, and authority. Occupations, whose providers possess the power to control or produce the activity or service, are considered professions. Professions bestow the competent individual with autonomy (Haworth, 1986). Unfortunately, beneficent intentions can lead to unchecked authority (Collopy, 1988).

Fox (1986) and Pellegrino (1994) addressed this potential conflict. Physician beneficence has been essentially unchallenged for centuries. More recently though, moral conflicts have arisen due to increasing client autonomy. The disruption in the physician-client relationship has polarized beneficence and autonomy. This phenomenon has created a serious threat to physician beneficence as the basic principle of medical ethics. This special relationship between providers and clients should be a moral equation with rights and responsibilities on both sides that need balancing so that both parties act beneficently toward each other while respecting each other's autonomy.

Challenges to achieving this balance are encountered frequently. When clients question a provider's judgment or claim a right to any procedure they desire, when providers insist on using a paternalistic approach, or when managed care systems stress economics over ethics, everyone concerned experiences conflict and difficulty in achieving the necessary equilibrium between beneficence and autonomy. Conversely, a true balance is not always desirable. An example would be when caring for the elderly and dependent client. As dependency increases, responsibility shifts to the provider. This is sometimes called a paternalistic form of beneficence. The goal becomes not equality of beneficence and autonomy, but protection from harm and maximization of the client's self-governance. Thus, in some clinical situations, beneficence is more important than autonomy (Abramson, 1985; Brock, 1988; Pollard, 1993; Thomasma, 1984).

However daunting these challenges may seem, it is imperative that attempts to rectify the imbalance be pursued. When autonomy or beneficence are violated, the moral integrity of clients and providers is jeopardized. These two concepts must be mutually enforced in order to serve the good of the client and preserve the ability of the provider to serve (Porter, 1992; Thomasma, 1984).

Justice. Morality is not individually centered. What the individual chooses to do depends upon personal expectations and what others may do. Moral autonomy does not refer to personal principles, but to moral principles in their social context. Society creates a framework for moral actions and the interpretation of moral principles. The role of conscientiousness, obligation and responsibility are all components of justice in the expression of autonomy (Beauchamp & Childress, 1983; Dworkin, 1978).

## Organizational Perspective

Accountability/Responsibility. Batey and Lewis (1982) interviewed the directors of nursing services in 12 small hospitals (up to 200 beds) to determine the operational definition of autonomy and accountability. Autonomy was viewed as having structural and attitudinal components. *Structural autonomy* exists when professionals are expected to use their judgment in the context of work. *Attitudinal autonomy* exists for professionals who feel free to exercise their judgment. So, the autonomous professional both decides and acts on a decision. This is not to say that absolute independence or isolation is a function of autonomy. Rather, it is the relationship to responsibility and authority that professionals have and use. Thus, the principle consequence of autonomy is accountability.

Carmel, Yakubovich, Zwanger, and Zaltcman (1988) believed that nurses' autonomy was structurally limited by physicians' close supervision and control. A three-month strike by physicians in Israel in 1983 required that nurses provide primary health services without physician supervision. A self-administered questionnaire was completed by 1,144 nurses (61% return rate). Results revealed that although the level of autonomy and satisfaction increased during the strike, when physicians called off the strike there was no attempt by the nurses to preserve their increased levels of autonomy. It was concluded that although the nurses were able to satisfactorily meet the challenge of providing care independently, they were not ready or willing to make the situation permanent.

Authority/Shared Power. Tiffany, Cruise, and Cruise (1988) found a positive correlation between professional knowledge and levels of discretion or autonomy. Nurses (N = 526) who had

been selected randomly from several hospitals completed surveys measuring levels of discretion. The degree of individual discretion correlated with knowledge.

In 1989, Katzman compared the perceptions of 110 nurses and 53 physicians about the current and ideal status of the decision-making authority of professional nurses. The findings revealed that, in spite of expanding roles of nurses, there were disagreements and dissatisfactions between the two professional groups' perceptions on current and ideal authority levels for nurses.

Interdependence. The interdependence of health care workers improves the quality of care (see Chapter 4). McKay (1983) defines professional autonomy as both independent and interdependent practice-related decision making based on a complex body of knowledge and skill. Autonomy is necessary to the practice of a profession. It has to do with competence in determining why, when, and how activities must be carried out (Mundinger, 1980; Zander, 1980). However, caution must be taken when interpreting professional autonomy and independence. Parochialism and isolationism create many of the problems attributed to autonomy in health care today (Curtin, 1982; Henry, 1994; McKay, 1983). Appropriately, very few individuals or groups are fully autonomous; therefore, autonomy is a matter of degree rather than a fixed characteristic (McClure, 1984). McClure, Poulin, Sovie, and Wandelt (1983) found that although autonomy was felt to be a necessary condition of the professional role, it was not viewed as total independence. An interdisciplinary effort with shared decision making were essential ingredients.

Structure. Western societies subject their members to a wide array of controls, which serve to create conflict (Flathman, 1987; Lichenstein, 1984; Kane, Palette & Strickland, 1987). Autonomous development is stunted when the work environment restricts a person's opportunities for rationally framing, pursuing, and adjusting individual plans (Deci & Ryan, 1987; Schwartz, 1982).

The pervasive technical team orientation to health care provision has a tendency to remove the decision-making activities of individuals and, thereby dilute accountability (Clifford, 1981). Professional workers require different structures and management approaches that allow self-management and individual control of their own practices (Kerfoot, 1988). Leveling hierarchical organizations is believed to be one way to enhance autonomy (Brown, 1976).

Autonomy incorporates independence, responsibility, accountability, self-determination, and self-regulation. Two aspects of autonomy are *job-content autonomy* and *job-context autonomy*. Job-content refers to autonomy in the technological aspects of a job: the ability to determine the method and procedure for problem solving. Job-context refers to the environment

in terms of social and economic terms: the ability to define the boundaries of the problem and the price to be paid for dealing with it (Dachelet & Sullivan, 1979).

Freidson (1986) states that autonomous professions possess a measure of freedom that other occupations lack, but they are also dependent upon the organization that employs them. True professions, however, possess the power of gatekeeping. This power varies from organization to organization and profession to profession. It is this power base that allows physicians control of the health care system. Physicians not only have the ability to prescribe, but also to certify births and deaths, and admission and discharge from hospitals. They also serve as gatekeepers for the administration of government funds for health care. This type of autonomy maintains the professional status of medicine and highly influences the structure in which the services are delivered.

Engel (1970) conducted a study to determine if bureaucratic organization limits professional autonomy. Physicians practicing in solo (non-bureaucratic) practices (n = 230, a 40% return rate), privately owned (moderately bureaucratic) medical organizations (n = 276, a 54% return rate), or government (highly bureaucratic) organizations (n = 178, a 34% return rate) were surveyed. The number of hierarchical levels in each organization, the utilization of rules and regulations, and the availability of physical settings in which teamwork could be performed determined the degree of bureaucratization. Results revealed that those individuals practicing in moderately bureaucratic settings were more likely to consider themselves as autonomous, whereas those in highly bureaucratic settings were least likely to consider themselves autonomous.

Kramer and Schmalenberg (1988) found similar results in their study. They studied 16 magnet hospitals and found that autonomy was encouraged when bureaucratic rules and structure were minimized.

Alexander, Weisman, and Chase (1982) studied selected characteristics of hospital nursing units in an effort to identify the features of the work setting that influenced the staff nurses' perceptions of autonomy. Structured interviews lasting 30 minutes each were conducted with 789 non-supervisory registered nurses employed at one large university hospital. Results indicated that personal characteristics, as well as structural features of the unit, influenced the nurses' perceptions of autonomy.

Batey and Holland (1983) were interested in whether differences in state prescriptive authority made a difference in the prescription practices of nurse practitioners. A data instrument was sent to all who agreed to participate (188 nurse practitioners or a 46.7% return rate). The data instrument was a prescription log in which the name of each drug prescribed was recorded, whether the drug substitution was permitted, whether the drug was a refill, what kind of form was used to issue the drug (written, telephonic, etc.), and whether there was consultation with a

physician for the health problem requiring a prescription. Data were used from 156 of the nurse practitioners and included 11,985 prescriptions to 9,095 clients during 1,568 practice days. Results revealed that prescription practice was not influenced systematically by the level of autonomy granted through regulatory policy. The authors suggested that careful scrutiny of such policies should be conducted to determine their real function.

Satisfaction. Slavitt, Stamps, Piedmont, and Haase (1978) reported on a two-year research project that examined occupational satisfaction in three groups of in- and outpatient nurses in terms of autonomy, organizational requirements, pay, and task requirements. Autonomy was ranked as the most important, even though the nurses were only moderately satisfied with their current jobs.

Stamps, Piedmont, Slavitt, and Haase (1978) conducted a three-year research project that attempted to define the concept of occupational satisfaction among ambulatory health care professionals. A questionnaire was administered to three separate samples: 246 nurses in a hospital setting (73% response rate), 42 staff members including physicians, nurses, and support staff (90% response rate), and 450 nurses in another hospital setting (62% response rate). Autonomy was rated the most important factor contributing to overall satisfaction for all three groups of professionals.

Slavitt, Stamps, Piedmont, and Haase (1979) reported on a two-year research project that examined levels of satisfaction among hospital employees. The subjects were from two hospitals: 273 of 336 employees responded from hospital A (83% response rate) and 282 of 455 employees from hospital B (62% response rate). Respondents included registered nurses, licensed practical nurses, nurses' aides, ward clerks, orderlies, operating room technicians, and child care technicians. The questionnaire included 60 attitude statements. Results indicated that satisfaction levels clearly increased with job level, which was related to higher pay and increasing autonomy.

Weisman, Alexander, and Chase (1980) studied staff nurses in two hospitals to determine the types of independent variables that determine job satisfaction. Two large university-affiliated hospitals were the setting for the study. The sample included nurses employed on 105 different units which ensured that the sample reflected different organizational contexts and all major clinical areas. In the first part of the study, 98% of all post-orientation full time staff nurses at both hospitals were interviewed (720 at hospital A, 458 at hospital B). Five months later, 97% and 98%, respectively, of all eligible nurses were interviewed again. Hospital documents and reports from head nurses were additional sources of data. Results revealed that autonomy and task delegation predicted satisfaction most strongly.

Sarata (1984) implemented changes for staff at three youth treatment facilities and measured the satisfaction before and after the changes. Changes were made in three areas: salary increments, salary increments plus increased staff autonomy, or salary increments plus increased participation in decisions. Facility C retained the existing organizational procedures and gave the workers a 15% raise. Facility A implemented a reorganization, which gave the workers responsibility for initiating and coordinating treatment plans plus a 12% raise. Facility P adopted a multi-disciplinary approach to treatment planning and a 12% raise for the workers. Data were collected three times at each facility for a total of 162 worker questionnaires used in the analyses. Results revealed that satisfaction with pay, work and client progress were identical for the high autonomy and high participation condition. High autonomy workers reported a decrease in their level of satisfaction with their supervisors, while high participation workers reported a decrease in their level of satisfaction with their co-workers. Sarata (1984) concluded that participation is a substitution for autonomy and a useful alternative for managers.

Roedel and Nystrom (1988) conducted a study of 135 registered nurses (75% response rate) in a 200-bed community hospital. Two questionnaires were completed to determine job components that related to satisfaction. Results revealed statistically significant relationships among job satisfaction and task identity, autonomy, and feedback from the job.

Philosophical Perspective

Autonomy, from a philosophical perspective, is usually discussed in terms of personal autonomy and social autonomy. Autonomy and participation are concepts which characterize the heart of human life (Neville, 1974). Kant (1964) insisted that persons should always treat each other as autonomous ends, rather than means to the ends of others. The value of autonomy is arrived at when persons are rational beings of unconditional worth. Autonomous agents have the will and duty to govern themselves in accordance with universally accepted moral principles.

Mill (1974), on the other hand, addressed autonomy in terms of action and thought rather than the person's will. All citizens should be permitted to develop their own potential as long as it does not interfere with the expression of freedom of others. Stated further, unbridled individualism is incompatible with achievement of social goals and human interchange. A person is not abstracted from society. All dimensions of personal autonomy have social or participation dimensions (Curtin, 1982).

Political Perspective

The most dominant and formidable tradition of Western culture is that of political freedom. The concept of individual well being has acquired a significant amount of popularity; it is the ideal condition for personal autonomy. Free choice is an essential ingredient of individual well being.

The conditions of the industrial age and technology revolution are well suited to individual freedom since the changing technological, economic, and social conditions demand the ability to adjust, acquire new skills, and to come to terms with new scientific and moral views (Raz, 1986).

Despite the fact that individual freedom dominates Western society, Dempster (1994) suggests that autonomy is never absolute or complete. She viewed autonomy on a dynamic continuum. She suggested that actualization, valuation, and empowerment are dimensions of autonomy. Actualization involves decision making and accountability. Valuation involves merit, worth, and usefulness. Empowerment involves legitimacy, sanction, legal status, and possessing rights and privileges that are granted by self or others, or both. In all three dimensions there are opportunities for others to set limits on the level of autonomy.

Legal autonomy is granted to health care professionals by the individual states through their licensing mechanisms. Such legal boundaries are designed to limit the practice of professionals (Dachelet & Sullivan, 1979). Those boundaries also protect particular professional groups from encroachment by others. Licensure essentially creates a legal monopoly over strategic aspects of work and prevents free competition. It permits the control of the production and application of knowledge and skill in the work a professional performs, which, in effect eliminates the possibility of criticism and evaluation by others (Freidson, 1970; Kelly, 1987; Porter, 1992).

Physicians and administrators exert significant control over the social context of the health care system. The public also determines the value of the service and influences the degree of autonomy of the various professions; a profession agrees to abide by a code of ethics, thereby persuading society to grant autonomy (Dachelet & Sullivan, 1979; Freidson, 1970; Kelly, 1987). In exchange for the status and prestige accorded to professionals, society expects exemplary behavior (Stuart, 1981).

Advantages of autonomy include increases in status, power, and the ability to develop a scientific knowledge base. A disadvantage of autonomy is dissension within the profession. An example is the introduction of the nurse practitioner. The movement to greater autonomy has increased the power and status of the nurse practitioner. The fact that the health care system was willing to experiment with new practice patterns and settings fostered the nurse practitioner movement. However, the concept of the nurse practitioner was originally shunned by professional nursing organizations who feared fragmentation of services and a growing separation of the cure-care dichotomy (Dachelet & Sullivan, 1979).

Freidson (1970) refers to autonomy as the control over the content and terms of work. In fact, he proposes that the only important criterion for distinguishing professions from occupations is autonomy. A professional is self-directing. Professions are more likely to have the capacity to self-direct when they have obtained a legal or political position of privilege that protects them from

encroachment by others. The foundation of medicine's control over its work is political in character and involves a legal system which assists in maintaining control and dominance (Freidson, 1971). However, the physicians' level of control in the health care market has had negative ramifications. An example is the exclusion of other, possibly more appropriate, professions from receiving third-party payment.

If a competition analogy is used to understand professionalization, autonomy becomes the outcome of monopolizing services. Expansion of service boundaries and control of distribution of services become the avenues with which to accomplish professionalization. In a competitive market, all occupational groups expect resistance from others protecting their markets. Young (1985) examined the legislative, regulatory, and judicial revisions of state laws that affected nursing service from 1970 to 1984. The legal definitions of nursing practice were reviewed and compared to the definitions during the 1970s and early 1980s. Results revealed that market competition was a major factor in the policy-driven distribution of autonomy in nursing. It was discovered that as nursing services were expanded to include functions that overlapped with other occupational groups, nurses became less likely to have exclusive control over those services.

Psychological Perspective

Kurtines (1978) developed a measure of individual differences in autonomous rule compliance. To determine the reliability and validity of the scale, several analyses were conducted. The total sample size was 245 people. When a model of moral character consisting of the dimensions of socialization, empathy, autonomy, moral knowledge, and moral reasoning was used, results revealed that persons with the lowest rating on autonomy were judged to be mildly anxious, lacked self-confidence, and were unsure about their goals in life. High autonomy scorers were relatively free from anxiety, dependency problems, and had well-defined life goals.

Lifton (1983) conducted two studies to determine the reliability and validity of the autonomy scales developed by Kurtines (1978). He found that autonomous individuals exhibited both socially desirable and undesirable qualities (e.g. independent and strong-willed versus egotistical and irresponsible). He concluded that autonomy is a complex, multidimensional personality dimension.

Breaugh and Becker (1987) reported the results of three studies done to evaluate the validity and reliability of their Work Autonomy Scales. An experimental design was used to determine the degree to which self-report of autonomy actually matched objective conditions. Undergraduate business students ($N = 114$) participated in the study. A close relationship between the experimental conditions and self-reports of autonomy was found.

Sociological Perspective

Professionalization. Professional behavior is defined as having four attributes: a high degree of knowledge; altruism, putting community interest over self-interest; self-governance of its members following a code of ethics; and a system of rewards that represent work achievement (Barber, 1963; Sargent, 1987). To ensure that professionals working in organizations have the appropriate autonomy to express these attributes, an optimal level of autonomy must be achieved. At too low a level of autonomy, professionals become parochial; at too high a level of autonomy, professionals become disloyal, which could put the organization's very survival at risk (Katz, Vignos, Moskowitz, Thompson, & Svec, 1968). On the other hand, semi-professions or marginal professions experience difficulty attaining dominance in knowledge level and altruism, because these attributes are not only defined by the professions, but by the public (Barber, 1963).

As stated earlier, Dempster (1994) proposed that autonomy and professionalism are a matter of degree. There are relative differences between professional and semi-professional behavior. Behavior is fully professional, partly professional, or not at all professional. In healthcare delivery, physicians have traditionally had nearly absolute autonomy. As the dominant professional group, they have effectively controlled the activities and scope of practice of all health care workers. Physicians were responsible for shaping health legislation, controlling access to clients, and even controlling information (Conway, 1978).

Etzioni (1969) reiterated this concept of semi-professions. He felt that there was a middle ground on the continuum where certain occupations required less specialized bodies of knowledge and experienced status that was less legitimated than the fully professional occupations. Although the semi-professions may seek to improve their status, there will remain differences that result from the division of labor. For example, autonomy should vary between professions and semi-professions.

Deprofessionalization. Contrary to the belief that more and more occupations are becoming professionalized, or that the professionalism of current occupations is not threatened, *deprofessionalization* predicts that self-employment among professionals is disappearing. It suggests that professionals are losing autonomy at work and are, increasingly, becoming subordinate to their employers (Derber, 1982; Haug, 1973).

Haug (1973 & 1975) believes that the industrialization and professionalization of society are things of the past. The post-industrial era poses new challenges to professions. According to Haug, the basic tenets of a profession include mastery over knowledge, a humanitarian approach in application of that knowledge, and autonomy in the occupational role. Today the knowledge monopoly of professions is weakening. Computer technology is eroding it. This erosion has

served to place strains on professionals attempting to stay abreast of new knowledge. Also, as the educational achievements of laymen improve, many will begin the demystification of a profession's expertise. Thus, deprofessionalization is the trend of the future.

The legitimate range of medical practice is becoming more difficult to define. Paraprofessionals are assuming responsibilities and are providing diagnostic and prescriptive services that belonged solely to the physician in the past. In an effort to maintain professional autonomy, it is suggested that practitioners make judgments that embrace the philosophy of the supporting organization (Hardy & Conway, 1978; Mirvis, 1993).

Health care organization reform is a major threat to the autonomy of the physician. Health Maintenance Organizations and group practices continue to place physicians in bureaucratic structures as employees. Physician performance is monitored and regulated by Diagnosis Related Groups, limited length of hospital stays, peer review organizations, and quality control (Haug, 1988). Malpractice, legal intrusions, physician surplus, and increased competition and specialization are other assaults on the medical profession (O'Connor & Lanning, 1992). The new business orientation of health care, complete with bureaucracy, is serving to limit the autonomy of practitioners in many aspects of their work (Ritzer & Walczak, 1988).

Light and Levine (1988), McKinlay (1982), and McKinlay and Stoeckle (1988) agreed with the concept of deprofessionalization and considered it a movement toward proletarianization. Proletarianization occurs when an occupation is divested of control over certain prerogatives, thereby subordinating it to the requirements of production. This subordination results in the de-skilling and routinization of work. As technology advances, professionals must depend upon capitalists to provide the supplies and equipment. As the dependency grows, so does the capitalist's ability to shape production. As professionals are forced to rely on complex organizations and financial arrangements to carry out their work, intrusion is experienced in their ability to work and in their relations with their customers. This intrusion also negatively influences their credibility with society. Specialization also drives the professional toward deskilling. This leads to the capitalist technique of paying workers less and making them more replaceable. Not only must they work with non-professionals, they must also become dependent on the knowledge and performance of others.

Professionalization Revisited. Freidson (1984) questioned whether evidence supporting the theory of deprofessionalization was valid. Practitioners may not be as free to make individual judgments as they were in the past, but there still remains the expectation that they make decisions using their own discretion on a daily basis. Also, although professionals work in bureaucratic organizations and take orders, a super-ordinate colleague, not management personnel, gives these orders. In essence, professional workers create and supervise

themselves. The formalization of these working relationships has changed and is more overt and consequential than they have been in the past. Freidson proposed that as long as practitioners control their own work, their professional status would not be threatened.

Mechanic (1991) suggested that, although physician professionals are less autonomous than they used to be, the constraints imposed upon them within a medical paradigm is more central to the economy and more powerful than ever before. From a cultural standpoint, there has been an increase in the emphasis on medicine and health and the public's dependence on it. Medicalization of personal and social problems continues to persist. From a social perspective, medical practice remains dominant primarily because of the advancements in medical knowledge and technologies. And, finally, at a personal level, physicians continue to maintain the economic and technical control of medicine.

What may appear as efforts to limit physician autonomy, may, in fact, be an attempt to stimulate self-regulation and the return to stewardship (Wolinsky, 1988). Although physicians believe that they are losing control of their work as capitation and salary become the more prevalent types of payment, others see this as an inequality between the united medical profession and large numbers of disparate payers. Wolinsky concluded that money is the crux of the issue.

Medicine remains as the single most powerful occupation in health and health care. As a profession, it has the ability to draw on several sources of power and prevent the changes that it does not desire. The real questions should be whether medicine is as powerful as it once was and, if not, which dynamics are producing the changed social position of the profession (Coburn, 1992).

Major Findings

Autonomy is viewed as having structural and attitudinal components; an organization grants certain levels of autonomy and providers perceive certain freedoms to exercise their judgment (Alexander et al., 1982; Batey & Lewis, 1982; Dachelet & Sullivan, 1979; Deci & Ryan, 1987; Schwartz, 1982; Tiffany, Cruise, & Cruise, 1988). The degree of autonomy granted through regulatory policy did not influence prescription practices of providers (Batey & Holland, 1983), but bureaucracy did influence the levels of perceived autonomy. Those individuals practicing in highly bureaucratic organizations were least likely to consider themselves autonomous. Providers practicing in moderately bureaucratic organizations were more likely to consider themselves autonomous (Engel, 1970; Kramer & Schmalenberg, 1988).

Self-reported measurements of autonomy match objective conditions. In a sample of undergraduate business students, Breaugh and Becker (1987) discovered a close relationship between objective and self-reported results.

Autonomy is based on competency, collaboration, and professionalism. The autonomous person is not overly dependent on others, but is distinguished by the need to grow and gain competency (Collopy, 1988; Haworth, 1986; Mundinger, 1980; Zander, 1980). The practice of a profession has to do with competence in determining why, when, and how activities must be carried out (McKay, 1983; Mundinger, 1980; Zander, 1980). To ensure that professionals have the appropriate amount of autonomy to be effective, an optimal level must be achieved, based on their credentials and competencies. However, professionals need to be both independent and collaborative (McClure et al., 1983). Autonomy and professionalism are a matter of degree (Barber, 1963; Dempster, 1994; Etzioni, 1969; Katz et al., 1968; Kerfoot, 1988).

Job satisfaction is closely linked to autonomy. In fact, it is reported as the most important component of job satisfaction (Roedel & Nystrom, 1988; Sarata, 1984; Slavitt et al., 1978 & 1979; Stamps et al., 1978; Weisman et al., 1980).

### Major Limitations

The major limitation to the literature on autonomy is the obvious lack of empirical investigation in this area, especially as it relates to health care professionals.

## Results

### Characteristics of the Autonomy Variable

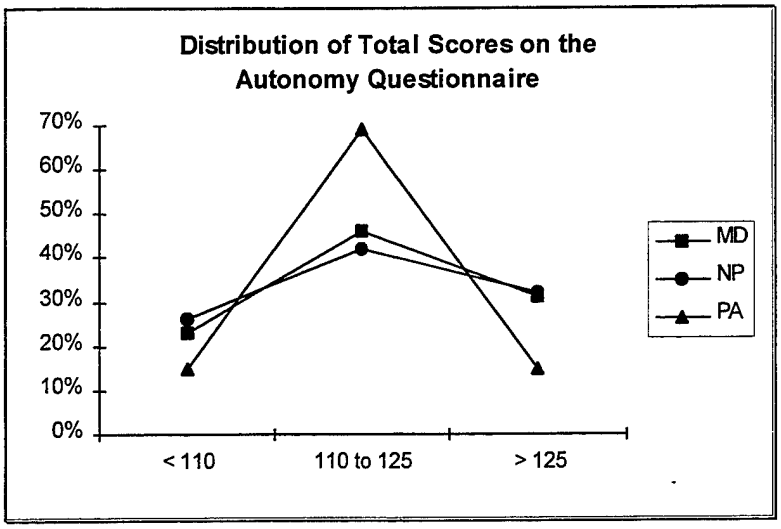
The objective of this portion of the data analysis was to describe the nature of the data collected on provider autonomy. For these analyses, providers were divided into three groups on the basis of their professional credential (physician, nurse practitioner, physician assistant). Descriptions of the basic demographic characteristics of the sample are provided in Chapter 1. Results of the analysis of the differences among provider types in experience and utilization are described in Chapter 2. Results of the analysis of the reliability and validity of the autonomy questionnaire are described in Chapter 9.

Frequency analysis of items on the autonomy questionnaire (see Appendix A) revealed an extraordinarily high degree of agreement among providers on most items (i.e., they rated items as "true most of the time" or "always true" or in the case of reversed items they rated them as "never" or "sometimes"). The exceptions to this finding were items concerned with "own my practice," "establish the limits of my practice," "have the power to influence others," "have the respect of others," and "have a legal basis for independent functioning." Providers were essentially equally divided among ratings on these items (21, 22, 24, 27, and 29).

Total scores on the autonomy questionnaire ranged from 94 to 148. A score above 125 indicated a strong sense of responsibility, self-determination, and self-regulation. A score of less

than 110 indicated difficulty with bureaucratic constraints, routine tasks, and perceived inequities. Figure 3-1 illustrates the distribution of scores on the autonomy variable. Mean total scores on the autonomy questionnaire were 120.88, 119.11, and 117.46 for MDs, NPs, and PAs, respectively. A one-way analysis of variance was used to determine whether mean differences among the three groups of providers were statistically significant. Groups were not significantly different.

**Figure 3-1**




Intercorrelations of Practice Style Variables

The objective of this portion of the data analysis was to quantify the relationships among practice style variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 3-1 provides the intercorrelation matrix of these variables. It is clear from the data in Table 3-1 that there was a good deal of overlap among the practice style variables. There was a strong positive correlation between autonomy and four of the other five practice style variables: confidence, collaboration, information giving, and job satisfaction. There was a strong linear relationship between confidence and autonomy. The provider who was low on one tended to be low on the other, while the provider who was high on one tended to be high on the other. This finding was somewhat surprising given that in many Army settings, including healthcare settings, inexperienced, less confident, members are routinely provided high levels of responsibility and autonomy. Anecdotal evidence gathered during the course of this study suggested that two factors combined to make the primary care setting different. First, individual providers were encouraged to develop practice templates which limited the types of health problems that they would see. Second, management policies put clear limits on provider autonomy (for example, policies formally defining scope of practice, participating in

preceptor programs, and obtaining local credentials). Thus, the correlation of confidence and autonomy is predictable in this setting. The association of autonomy and collaboration seemed more straightforward. The more autonomy a provider has, the more likely he or she is to have relationships with other providers that are truly collaborative (as opposed to supervisor-subordinate, mentor-mentee, or preceptor-preceptee relationships). A similar logic could explain the relationship between information giving and autonomy. Part of the role of the primary care provider is to act as a "gatekeeper." This role influences the nature of the information the provider may share with the client. The more autonomy a provider has, the more likely he or she is to feel free to exercise personal judgment in this arena. Thus, autonomy and information giving covaried positively, when one was high, so was the other. Finally, the overlap of autonomy and job satisfaction was not at all surprising. The literature is replete with examples of the importance of autonomy in shaping job satisfaction.

**Table 3-1**

**Intercorrelation Matrix of Practice Style Variables**

| N = 58 | Practice Model | Confidence | Autonomy | Collaboration | Information Giving | Job Satisfaction |
|---|---|---|---|---|---|---|
| Practice Model | 1.00 | | | | | |
| Confidence | 0.38 | 1.00 | | | | |
| Autonomy | 0.35 | 0.41 | 1.00 | | | |
| Collaboration | 0.32 | 0.25 | 0.56 | 1.00 | | |
| Information Giving | 0.41 | 0.36 | 0.52 | 0.43 | 1.00 | |
| Job Satisfaction | 0.28 | 0.23 | 0.54 | 0.45 | 0.30 | 1.00 |

The analyses presented in this chapter form the basis for an understanding of how autonomy was viewed by the provider sample. Chapters 6, 7, and 8 describe the results of analyses of the impact of provider practice style on client outcomes.

## Conclusions

(1) The average level of autonomy was not significantly different across the three types of providers. However, there was substantial diversity of opinion among providers concerning the ability to self-determine the limits of practice and the power to influence others. This diversity was not a function of provider type.

(2) Autonomy was the variable which was most strongly and positively correlated with other practice style variables. Congruent with the results of previous research, the level of autonomy predicted the level of collaboration, job satisfaction, information giving, and confidence in skills.

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# CHAPTER 4
# COLLABORATION

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## Introduction

Collaboration is an abstract concept that is considered to be on the leading edge of a paradigm shift in the post-industrial era. It is also said to influence the structure, process, and outcomes of health care delivery systems. Although it has been promoted for some fifty years, the health care industry has yet to embrace it fully and, instead, grapples with its implementation. This is unfortunate since most of the empirical work demonstrates positive benefits to all members, and all parts, of a system. The purpose of this study was to determine how primary care providers' collaboration influenced client outcomes.

Definitions of collaboration are plentiful. The concept and its implementation are complex and are generally described as attitudes rather than as concrete set of actions (King, Lee, & Henneman, 1993). Most of the health care literature describing collaboration does so in the context of nurse-physician relationships. However, anthropologic, sociologic, and other disciplines describe collaboration similarly.

Broadly speaking, collaboration is defined as a relational system. It is when two or more individuals share mutual goals and aspirations in a common conceptual framework (Appley & Winder, 1977; Henneman, Lee, & Cohen, 1995; Kappeli, 1995; Mauksch 1981; Pike et al., 1993; Smoyak, 1977). Collaboration occurs between people and cannot be legislated by institutions. It will not occur automatically just because a multi-disciplinary team is formed (Alpert, Goldman, Kilroy, & Pike, 1992; Henneman et al., 1995; Reynolds, Giardino, Onady, & Siegler, 1994; Wise, Rubin, & Beckard, 1974). The individual members must choose to develop and maintain a high degree of trust and a strong commitment to each other and mutually agreed upon goals. (Alt-White, Charns, & Strayer, 1983; Appley & Winder, 1977; Arcangelo, Fitzgerald, Carroll, & Plumb, 1996; Burchell, Thomas, & Smith, 1983; Henneman et al., 1995; Johnson, 1992; Pike et al. 1993; Reynolds et al., 1994).

Collaboration enhances the expertise of all members, because recognition and acceptance of each person's sphere of responsibility is the basis for collaboration (Jones, 1994; Weiss, 1985). When each person's expertise is valued and capitalized upon, a synergism occurs which produces an output that is greater than the sum of the parts. The client is viewed from different perspectives, which encourages optimization of each person's contribution to quality patient care (Arcangelo et al., 1996; Kappeli, 1995; Pike et al. 1993; Siegel, 1974; Weiss, 1985).

An example is the potential complementary differences between medicine and nursing. Each profession has its strengths and weaknesses: medicine's strengths are in its exactness and predictive capability; its weakness is in its inability to relate health problems to every-day activities. Nursing's strengths are the potential to integrate, to act dynamically, and open-endedly; its weakness is the inability to prioritize and identify clear goals (Kappeli, 1995).

Collaborative practice implies shared responsibility and accountability for delivery of care (Elpern, Rodts, DeWald, & West, 1983). However, each member must be able to practice autonomously. For quality care, each member must be autonomous, work independently, and maintain personal accountability. Therefore, it is suggested that one can be collaborative and autonomous at the same time. Providers do not truly work alone, but consult others in order to provide good care (Arcangelo et al., 1996; Birenbaum, 1994; Pike et al. 1993; Running, 1995). Collaboration requires a shift from unilateral dependence to interdependence (Mauksch, 1981). The essence of collaboration is to work together to satisfy both separate and interdependent interests (Reynolds et al., 1994).

Collaboration includes components such as collegiality, cooperation, coordination, effective communication, assertiveness, competence, confidence, safe relationships, and a sense of caring for each other. (Baggs & Schmitt, 1988; Johnson, 1992; King et al., 1993; Pike et al. 1993; Reynolds et al., 1994). Competition and accommodation are decreased (Baggs & Schmitt, 1988; Kraus, 1980).

There are many different interpretations of the concept of collaboration. King et al. (1993) believe that there is no real consensus regarding the definition of the term and no agreement on its essential elements. The Styles Stipulation seems appropriate: "As a word gains in popularity, it loses its clarity" (Styles, 1984, p. 21). Pike et al. (1993) proposes that collaboration is not equivalent to cooperation, communication or compromise because they do not embody the richness that collaboration implies.

It may not be appropriate for every decision to involve a collaborative effort. If collaboration is an attitude (King et al., 1993), then perhaps providers may know instinctively when joint decision-making is required (Siegler & Whitney, 1994a). Counting the number of interactions between providers does not indicate the effectiveness or efficiency of the collaborative team. It has been proposed that the ideal collaborative practice is one in which the professionals adapt to the needs of the client and the clinical setting (Siegler & Whitney, 1994a). Dynamic relationships encourage creativity and resist institutionalization, while collaboration creates trust and supports care (Heenan, 1990).

## Barriers to Collaboration

Unfortunately, there are many barriers to establishing dynamic collaborative relationships. These barriers are not unique to the health care professions and are steeped in tradition (Heenan, 1990; Kappeli, 1995). Viewing collaboration as association with the enemy may indicate more accurately the relationship among health care providers; particularly, physicians and nurses. (Henneman et al., 1995). Historians have traced the conflict between physicians and nurses back

to the 19th century (Fagin, 1992). Not only do relationships between providers reflect this history and tradition, but they also reflect the various political, economical, social, and cultural influences of the time. Thus, stereotypes, role expectations, differences in gender, social status, and education have led to a more competitive, rather than collaborative, environment (Colè & Perides, 1995; Makadon, 1985; Siegler & Whitney, 1994b). A competitive environment corrupts relationships before they actually begin (Bass, 1981; Ferrer & Navarra, 1994; Kappeli, 1995; Michelson, 1988; Pike et al. 1993).

Collaboration between nurses and physicians is not the usual mode of practice today (Henneman et al., 1995). Obstacles to its implementation come from both professions. The American Medical Association (AMA) and the American Nurses Association (ANA) agree that physicians and nurses need to work together as a team, but there is disagreement as to whom should maintain the role of team leader. The AMA's position is that doctors should remain leaders because they have more expertise. The ANA's position is that nurses do not always require supervision (Hilderley, 1995; Page, 1994). It is interesting to note that, although all groups have leaders, groups that embrace collaboration experience changes in leadership, depending on the need of the client or problem (Reynolds et al., 1994). In an effort to compromise, the AMA proposed that the goal of collaboration should be exchanged for a concept based on integration (Page, 1994; Running, 1995).

Limited knowledge of each other's scope of practice and expertise is one of the major obstacles to forming collaborative practice (Alpert et al., 1992; Mechanic & Aiken, 1982). The preconceived, often erroneous, expectations of roles and status do little to enhance a change in relationships between providers. A professional is typically familiar with his/her own customs, language, and culture, which only reinforces the inaccurate perceptions of others (Carr-Saunders & Wilson, 1933; Lynaugh & Bates, 1973; Mailick & Jordan, 1977; Siegel, 1974). Healthcare professionals are trained to function independently and autonomously, so learning to work as a team member is not an easy task (Mackay, Soothill, & Webb, 1995; Wise et al., 1974). In a study of 60 medical students, it was discovered that their perceptions of the physician's role as it related to the client and health care team became more specific as they progressed through the four year program, while their perception of the nurse's role became more vague (Webster, 1985).

As medical care becomes more complex, professions are becoming more isolated from one another (Mechanic & Aiken, 1982). This distance creates conflicts over values and attitudes, as well as power and prestige (Siegel, 1974). It is assumed that differences in status and power negatively influence the development and contribution of others (Kappeli, 1995; Lynaugh & Bates, 1973).

The "doctor-nurse game", a term coined by Stein in 1967, describes the hierarchical organizational structure that places the physician in a position of authority who provides the other

members with a sense of security. Indirect communication is the standard and is, admittedly, inefficient, stifling, and anti-intellectual. Tellis-Nayak and Tellis-Nayak (1984) describe a paradox of power, in which society ascribes stratification of groups and, at the same time, requires a collaborative effort to ensure social enterprise. When these opposing ideas of power are brought together in relationships between nurses and physicians, communication styles are elaborately distorted to maintain the differences in status and authority.

Although the idea of collaboration is to view each profession's contribution equitably, it cannot be ignored that the medical profession continues to dominate health care provision. Physicians maintain legal responsibility for client care and key positions in managing and directing the health care system. Thus, it is difficult to imagine why physicians would choose to change. If collaboration became the norm, power would need to be shared among health care providers according to expertise and client needs (Mackay et al., 1995; Makadon, 1985). Compelling reasons to institute collaborative practices will be discussed in the next section.

## The Need For Collaboration

Social and economic factors of health care today mandate significant changes in the way it is delivered. The demand for care has increased and changed. The American public is searching for the highest quality care to the largest number of people at the most economical price (Makadon, 1985). Advances in science and the "medicalization" of common health problems have broadened the need for medical care (Mechanic & Aiken, 1982). The complexity of diagnostic and therapeutic capabilities has increased the specialization of health care professionals (Elpern et al., 1983; Fagin, 1992; Kenneth, 1969). Additionally, emphasis has been placed on the need for health promotion and illness-prevention strategies (Poulton & West, 1993; Weiss, 1985). At the same time, people are living longer, thus creating increased demand, especially as the incidence of chronic disease rises (Elpern et al,, 1983).

Because the social context of health care delivery has changed, the system itself must change. There is a need to develop the kind of dialogue and collaboration that enhances client care and maximizes the effectiveness of health services (Kenneth, 1969). Gaps and overlaps in service need to be eliminated in order to better utilize health manpower (Mailick & Jordan, 1977; Mason & Parascandola, 1972).

Given that client care is complex, no one provider type is capable of doing everything for every client. Thus, an interdisciplinary approach with a diversity of skills is advocated. Each member will influence the behavior of the others especially in the areas of diagnosis and treatment (Pike et al. 1993; Poulton & West, 1993; Reynolds et al., 1994; Siegel, 1974).

Clients, physicians, and other professionals will experience positive outcomes from collaborative efforts. Benefits to the client include high-quality, comprehensive, multi-disciplinary, low-cost health care (Burchell et al., 1983). The client, as a partner in health care decision-making, receives a wider range of services from the most appropriate provider. Non-physician professionals will have greater opportunity to achieve competence in their field and to evaluate their efficacy. Physicians will experience less legal vulnerability and greater satisfaction with colleagueship (Mauksch, 1981).

## Fostering Collaboration

Collaboration does not occur overnight. In fact, it won't occur just because teams are formed. Collaboration is a process that is evolutionary in nature and occurs over time. The first step is to recognize its potential benefits. The second is to create an environment that is conducive to its development. The final step is to allow the players to evolve (Johnson, 1992). Collaboration needs to occur on a personal level, in the design and implementation of the curriculum of professionals, and in client care in clinics, hospitals, and communities (Reynolds et al., 1994).

On a personal level, it is recommended that a change in attitudes and behaviors take place. The requirement for role realignment will certainly cause anxiety and frustration. So, first and foremost, people must examine their inner feelings, communicate openly with each other, listen, and directly deal with conflict (Alpert et al., 1992; Mackay et al., 1995). This would require major efforts from the professionals involved (Sweet & Norman, 1995). Appley and Winder (1977) describe it as a "leap of faith" to overcome habits and a fear of change. To foster collaboration, individuals must possess a degree of bravery; they must stand aside from their professional group and acknowledge the contribution of others (Mackay et al., 1995).

The education of professionals in formal institutions and in continuing education settings has been the target of collaborative efforts. Interdisciplinary learning broaches the subjects of role delineation and negotiation and allows for territorial concerns to be discussed (Balassone, 1981). Emphasizing the combination of holistic client care and interpersonal characteristics of the various health care providers is one conceptual model (Ivey, Brown, Teske, & Silverman, 1988). Another model is one in which a series of courses is developed that would be beneficial to all health disciplines (Mason & Parascandola, 1972). To emphasize the clinical component of health care education, an intern and a student nurse made rounds together and discussed the plan of care for his/her group of clients (Shumaker & Goss, 1980). Postgraduates were the focus of the 1994 position paper by the American College of Physicians Task Force on Physician Supply. It favored

exploring joint continuing education programs with nurse practitioners and physician assistants. These programs would emphasize the team approach (American College of Physicians, 1994).

Several national organizations have supported the idea of collaboration and have worked jointly with other professional groups to develop recommendations for the implementation of the concept. As early as 1972, a group called the National Joint Practice Commission (NJPC) was formed. Members from the AMA and ANA established goals for collaborative practice. These goals were to increase job satisfaction for the nurse and to lessen the supervisory requirements and improve coordination with other professionals for the physician. The goal was to achieve greater client satisfaction and better use of the professional staff. The client was to receive more personalized care (Devereux, 1981b). Unfortunately, the AMA withdrew support from the NJPC in 1981 due to the conflicts over expanding roles and increased salaries for nurses (Fagin, 1992).

The National Advisory Council on Nurse Education and Practice and the Council on Graduate Medical Education jointly adopted a set of recommendations that were pertinent to collaborative practice amongst primary care providers. This work group also advised the Councils and the Bureau of Health Professions in regards to national requirements for physicians, nurse practitioners, and physician assistants (American Organization of Nurse Executives, 1995).

The President's Commission on Nursing and the Institute of Medicine, have recommended that formal partnerships be formed between physicians and nurses (Fawcett & Carino, 1989). The National Academies of Practice were organized in 1981 and continue to provide a forum for interdisciplinary exchange of ideas. They view collaboration as the next evolutionary step after independent practice (Lewis, Griffith, & Hawkins, 1997).

At the health care provision level, several models of collaborative care are evident in the literature.

(1) A community hospital adopted the recommendations of the NJPC and developed a joint practice council to establish dialogue regarding roles and practice issues affecting physicians and nurses (Brunner & Singer, 1979).

(2) A Collaborative Clinical Service was developed for the substitution of nurse practitioners for medical residents in an acute care teaching institution. Collaboration between the nurse practitioners and physicians was the most essential ingredient in this model (Genet et al., 1995).

(3) A Special Care Unit (SCU) was designed specifically to incorporate shared governance, case management, and family involvement to meet the needs of the chronically critically ill. A randomized controlled trial is currently in progress to measure differences in outcomes of traditional versus SCU care (Daly, Rudy, Thompson, & Happ, 1991).

(4) A five-year study is being conducted to develop and test the effect of an Enhanced Professional Practice Model on five general medical/surgical units. Measurements will include

nurse retention, client outcome, and cost. Results should be available in the year 2000 (Ingersoll et al., 1995).

On an individual level, providers are realizing the benefits of collaborative practice arrangements. One emergency department manager utilized the concept of collaboration to solve problems in communication between field personnel and emergency department nurses and physicians (Coburn, 1988). A clinical nurse specialist described her transition from hospital to clinic radiation oncology. This transition required negotiation of roles, benefits, and collaborative practice issues. Collaboration was a success due to an emphasis on communication (Hilderley, 1991). Individual practitioners have reported that collaboration is the way of the future and will be essential to meet the changing needs of clients with fewer resources (Moore, 1994; Thomstad, Cunningham, & Kaplan, 1975).

## Literature Review

### Structure

Traditional hierarchies inhibit collaboration because it is assumed that those at the bottom are not equal to those at the top, whereas fluid, circular organizational structures tend to promote it (Reynolds et al., 1994). Hierarchies/bureaucracies promote the development of rules, which are communication stoppers, requiring those working at the clinical level to struggle to improve relationships (Kappeli, 1995).

Scott (1982) described the rationale and advantages of three different structural models: (1) An autonomous organization is appropriate when the work is unusually complex, uncertain, and of significant social importance. A strength of an autonomous organization is that primary responsibility is on the person granted the greatest discretion. This type of organization also places a high value on the needs of individual clients. (2) A heteronomous organization is one in which autonomy is somewhat limited. Professionals are subordinated to the administrative framework and, as a result, intrusion into the provider-client relationship may occur. Emphasis is placed on the macro criteria of care, as opposed to the micro concerns emphasized in autonomous organizations. (3) The third type of professional organizations is called conjoint. Professionals and administrators possess equal power. Both micro and macro needs are emphasized. This type of organization recognizes the interdependence between professionals and administrators.

Competition and win-lose relations were based on Darwinian and free market principles that assume that all units are autonomous (Appley & Winder, 1977; Trist, 1977). Managers compete for career opportunities and the interests of the work force are placed in an adversarial position. When environments are stable, the use of competition as a model is appropriate: it was

successful in building an industrial order (Trist, 1977). However, the healthcare system is experiencing complexities in rapidly changing environments which give rise to sets or systems of problems rather than discrete problems (the phenomenon called turbulence). No autonomous or independent person can effectively meet the complex demands of the new environment (Trist, 1977; Trist, 1983).

Collaboration, as opposed to the system of competition, is viewed as a paradigm shift in which all businesses, to include health care, must adopt to survive (Appley & Winder, 1977; Gray, 1985; Kraus, 1980; Magraw, 1968; Trist, 1977; Trist, 1983). The bureaucratic and win-lose mentality are impeding the ability to adapt to the new turbulent environment. Action is paralyzed, there is no clear identity, and an unsettled state exists. Conflict and doubt abound. People are bewildered and are not sure what is real. This type of environment results in withdrawal and privatization, rather than the much needed consensus and sharing (Trist, 1983).

Kraus (1980) defines collaborative organizations as those that: involve participative decision making, focus less on roles and more on functions, are operated as open systems in a non-hierarchical fashion, recognize process as well as input and output, foster interdependence, foster autonomy in the immediate work environment, utilize shared power and responsibility, and share a common frame of reference and value system.

Trist (1977; 1983) states that there are two approaches to implementing collaboration. The first is one with which the majority of people agree. It permits competition and bureaucracy to continue. Collaboration is encouraged in this approach but appears peripherally, only to improve productivity or to handle humanistic concerns. The second approach is one with which the minority agree. In this approach, collaboration is mandatory and central. It is linked to human survival and has long-term strategic implications; it will be the emergent social process that moves society from the industrial to the post-industrial era.

Beloff and Willet (1968) hypothesized that the organizational structure of the health care system would alter the pattern of medical care behavior of its client population. Medical students (eight to 12) from the third-and fourth-year classes, a public health nurse, and a health aide participated in the care of 50 multi-problem urban families for a period of 2.5 years. In the first year, 48% of the visits were for symptomatic reasons; in the second year, 28% were, indicating a shift to preventive medicine and health maintenance. In a follow-up study, Beloff and Korper (1972) studied 31 multi-problem families (147 persons ) for 30 continuous months while receiving comprehensive care provided by physicians, a nurse, a health aide, and a social worker. Utilization patterns were monitored and results indicated that the families demonstrated a change from an illness response pattern to one of health-orientation as indicated by an increase in health maintenance demands. The utilization of allied health personnel became more effective, thus having a physician-sparing result. Emergency visits for the experimental group were less than 5%

for the study period as compared to 17.2% for general medical clinic clients and 21.2% for the pediatric clinic. Alpert, Heagarty, Robertson, Kosa, and Haggerty (1968) found similar changes in behavior. They studied two groups of families; 175 families received collaborative interactions and 195 families served as controls. Fewer operations and an increase in health visits, as opposed to illness visits, were documented for the experimental group receiving interdisciplinary care.

Devereux (1981a; 1981b) conducted an evaluation of the National Joint Practice Commission project. A collaborative model was implemented which included primary nursing, an integrated medical record, and encouragement of nurses' decision making. Clients reported fewer complaints, felt a sense of security, felt important, and felt closer to the nurses. The nursing staff experienced increases in competency, efficiency, cooperation, and mutual respect.

Carter-Jessop, DeGregorio, and Lamb (1982) conducted a study to gather descriptive information about how different disciplines work together. They selected personal, clinical, and organizational variables. Following a pilot test, 373 questionnaires were distributed to all health care providers at 19 clinics. The rate of return was 70.5%. They concluded that organizational characteristics seemed to be more related to interdisciplinary activity than personal or professional characteristics. In fact, high team practice and low collaboration were reported simultaneously at times.

Alt-White et al. (1983) examined the personal, organizational, and managerial factors that contributed to nurse-physician collaboration. Nurses ($\underline{N}$ = 226) from six critical care units and 16 non-critical care units completed a questionnaire that focused on aspects of client care. Results revealed that educational preparation was not correlated with collaboration, however experience was. The more experience a nurse had, the less he/she collaborated with physicians. The primary care inpatient model of client management had a significant positive correlation with physician-nurse collaboration. Critical care nurses collaborated to a greater extent with physicians than nurses working in non-critical care areas. When nurses reported that the hospital did not hinder getting the work done, they reported that they collaborated more with physicians. Plans, policies, procedures, and protocols improved collaborative efforts. Nurse's job satisfaction was positively correlated with collaboration. The authors suggested that satisfaction was more a product of collaboration than the reverse.

Stichler (1990) examined the effects of collaboration, organizational climate, and job stress on job satisfaction and turnover. Registered nurses ($\underline{N}$ = 188) from six hospitals in southern California completed questionnaires. Collaboration between nurses and physicians and nurses and managers, organizational climate, and job stress had significant predictive validity for job satisfaction, accounting for 41% of the variance in job satisfaction. Organizational climate and

job stress were the strongest predictors of satisfaction. Job satisfaction was the strongest predictor of anticipated turnover.

Paterson and Peacock (1995) conducted a study in a four-partner, non-fundholding, urban practice with 6,000 clients. Data collection spanned two years. The goal was to evaluate a model of integrating complementary and allopathic practitioners into primary health care. Qualitative analysis of semi-structured interviews and retrospective quantitative data about the utilization of complementary practitioners were used. Complementary practitioners included osteopaths, a homeopath, an acupuncturist, a massage therapist, a reflexologist, a speech therapist, an Alexander technique teacher, and a chiropodist. Clients were free to refer themselves or be referred by another provider. The intervention was considered successful. Conflict over power, control and decision-making were largely prevented and a commitment to the idea of integrating complementary and allopathic medicine was maintained. The rate of change to a more collaborative work environment was slower than expected and referral rates varied among providers. The major limitation of the study was that it included only one clinical setting.

Process

The studies cited above speak to structural components that may or may not enhance or impede collaboration. The next section examines the actual process of interaction among health care professionals. The need for clearer communication and collaboration among health care professionals has been discussed for years. Studies on the actual types of interactions and the terms of decision making are reviewed.

Interaction. One research project explored the history of the doctor-nurse relationship. Older nurses were interviewed regarding their nursing interactions with physicians approximately 50 years ago. Taped interviews of older nurses (N = 34) who had worked and/or trained in Canada in the 1920s and/or 1930s were the sample for this study. Rules of communication in effect at the time were: show doctors respect; nurses cannot openly diagnose or make recommendations; open disagreement or confrontation is not allowed. Generally, physicians and nurses functioned as separate, independent entities rather than cooperating team members (Keddy, Gillis, Jacobs, Burton, & Rogers, 1986).

In another historical review, the interactions of a house officer with the nursing staff, as recorded in an 1888 journal, were compared with the interactions of a house officer with nursing staff that were tape recorded in 1990. Results indicated that although the interactions between nurse and physician occurred more than 100 years apart, more similarities than differences were revealed. In actuality, the 1888 journal spoke of collaboration between nurses and physicians more often than the 1990 tape (Pillitteri & Ackerman, 1993).

Bates (1966) and Bates and Kern (1967) conducted a study of nurse-physician collaboration in a 250-bed teaching hospital with a sample of 115 registered nurses and 90 physicians. A critical incident survey was conducted in the various inpatient and outpatient areas. Nurses identified 858 incidents concerning physician behavior and the physicians identified 528 incidents of nurse behavior. Results revealed that nurses described 56.6% of physician behaviors as hindering their work. Physicians described 54.7% of nurse behaviors as hindering their work. Nurses felt the most important physician behavior was communication, whereas physicians thought the most important nurse behavior was assisting the physician. The limitation to the study was that it was conducted in only one facility that was only three years old. Another study conducted by Moran (1991), involved the interview of ten nurses and ten physicians. Physicians felt that lack of communication was a minor negative characteristic of nurses.

Duff and Hollingshead (1968) examined a single illness experience from the time a client was admitted to a hospital until the illness ended or the client died. Although they indicated that the nurse-physician relationship was an integral part of the patient-care process, they observed that nurses rarely discussed clients with doctors. In fact, there was no communication between the nurse and physician except for limited written messages. The authors concluded that there was no nurse-physician relationship in the hospital.

Simborg, Starfield, and Horn (1978) studied six primary care practices which utilized both physician and non-physician providers. Records of at least 200 consecutively appearing individuals who were returning for a follow-up visit within six months of the previous visit were identified and 1,369 client-practitioner encounters were examined. Results regarding follow up appointments revealed that the highest rates occurred when the same practitioner saw the client at two successive visits. When a physician saw a client following a previous visit to a nurse practitioner, there was a significant drop-off in the follow-up rate of problems and therapies. This was true even when two different physicians saw the client on successive visits. The authors concluded that physicians responded much better to information generated by themselves or their peers and that interaction between physicians and nurse practitioners had not reached its potential.

Radka (1984) examined the extent to which collaboration existed between nurse practitioners and physicians in joint practice. Family or pediatric nurse practitioners completed a mailed questionnaire ($\underline{N} = 44$). Results indicated that there was no significant relationship between formal or informal consultation times and higher levels of collaboration. Significant positive relationships existed between collaboration and the nurse practitioner's years of experience and the number of years in a particular joint practice. A significant negative correlation was found between levels of education and collaboration scores.

Weiss (1985) conducted a study to determine whether ongoing discussion among nurses, physicians, and consumers influenced their collaborative beliefs and behaviors. A pretest-posttest control group design was used to compare the beliefs and behaviors of an experimental group who met consistently in discussion groups over 20 months with those of both a matched and a random group who did not participate in dialogue. Comparison occurred in the month prior to the onset of the discussion group and two years later. The final sample consisted of 60 experimental subjects, 38 matched subjects, and 35 subjects from the random group. The experimental sample was divided into four groups who met for 2.5 hours one evening each month in the 20 month study period. The mandate was to identify major problems in health care relationships among the nurse, physician, and consumer, and to identify role responsibilities and behavioral approaches that would alleviate these problems. Three staff members assisted in examining specific issues, but no interventions were made that might influence or change the ongoing interactions. Results revealed that at the beginning of the study the experimental sample, followed by the matched, and then the random sample, believed that there should be shared responsibility in health care relationships. Over the course of the 20 months, all samples showed a decline in their beliefs regarding the value of shared responsibility in health care. Only the experimental sample decreased in the amount of responsibility they believed nurses should have in health care and this was due to the nurses themselves. Interestingly, when the questionnaire was pre-tested, (Weiss & Davis, 1983), nurses believed they should have greater responsibility than did either consumers or physicians. The experimental and random samples thought that physicians should assume greater amounts of responsibility and all disciplines felt that consumers should exercise less responsibility. It was concluded that no positive change in collaborative beliefs occurred as a result of the dialogue among nurses, physicians, and consumers.

Weiss and Remen (1983) documented the interactions among nurses, physicians and consumers in the study above. Of the 1,585 interactions recorded and analyzed, only 342 actually involved nurses. The predominate interchange was a dyadic interaction between the consumer and physician. The nurse functioned more as a clarifier, facilitator, or witness, rather than making an active and unique contribution.

Temkin-Greener (1983) investigated the nature of an arrangement among different health care providers described as an interdisciplinary team. Interviews were conducted with 12 senior faculty at a large teaching hospital to gain insight into the nature of the arrangement referred to as a team. Eleven of those interviewed were department heads of nursing and medicine (six and five, respectively) and the twelfth was the head of the outpatient unit of general medicine. Results revealed that the only thing that the twelve subjects agreed upon was the definition of a team. Disagreements surfaced about who should assume the leadership position on a health care team, and consensus was not reached about what this role entailed. A common denominator reported

by all subjects was the lack of any structure to teamwork and the absence of organizational directives regarding teamwork. The authors concluded that the concept of interdisciplinary teamwork reflects more the desired means of delivering health care rather than actual procedures.

Lamb and Napodano (1984) measured the problem-solving and collaborative efforts of four nurse practitioner-physician teams practicing in two primary care settings. Each provider audiotaped every third client-provider encounter. When a decision was made to involve another team member in the client's care, those provider-provider and client-provider exchanges were taped. Data collection occurred over a three to eight week period for each team. Results from the pilot study revealed that physician providers did not initiate interactions in any of the encounters. In the second phase of the study, two primary care teams, each composed of one internist and one nurse practitioner, were asked to record data only if the decision had been made to involve a team member in the client's care. A total of 14 practice sessions were studied. Results indicated that eight of 168 (4.8%) client-provider exchanges resulted in an interaction of nurse and physician on one team and 19 of 236 (8.1%) on the other team. Of the 22 interactions, 21 were initiated by the nurse practitioner. Five of the 22 taped interactions were coded as collaborative by the investigators. In contrast, the providers thought that all of their interactions were collaborative. What is striking about these results is the minimal interaction among the providers and the lack of physician-initiated interactions.

Wonsetler (1987) conducted a study to describe self-reported collaborative behaviors of emergency department nurses, physicians, and residents. Twenty-three nurses (54% response rate) and thirty-four physicians and residents (89% response rate) completed the questionnaires. Results revealed that the nurses reported a high degree of clarification behaviors (89%) and a moderate degree of assertiveness (68%). The physicians reported a moderate degree of consensus-seeking behaviors (63%) and behaviors acknowledging the importance of the nurses' unique contributions (61%). The limitations of this study include the lower than expected return rate for nurses, it was conducted in a single setting, and that reported perceptions of collaboration may not indicate actual collaborative behaviors.

Hughes (1988) conducted a study of client categorization in an emergency room to examine the central features of doctor-nurse interactions. Using a traditional 'participant-observation' approach, the author observed 60,000 visits to the emergency room. He found that nurses were engaged in the tasks of diagnosis and treatment and that observed doctor-nurse interactions were contrary to the assumption that the working relationship of the nurse is subordinate to the doctor. Nurses frequently took the lead in the search for client information. A limitation to this study was the fact that it was conducted in a single setting by a single participant-observer.

McLain (1988) studied nine family nurse practitioners and nine physicians in joint practice. Each provider was interviewed separately and then together about their practice relationships. Interview questions included the categories of interaction, decision making, issues in health care delivery, critique of the health care system, and the relationship between theory and practice. Individual participants were interviewed during six to eight hours of actual practice and the interviews were audiotaped. Results revealed that 13 of the 18 participants (six physicians and seven nurses) gave reasons for being in a joint practice relationship that had little to do with client care. Nurses sought advice, clarification, and help. Physicians most commonly initiated interactions to instruct, correct or clarify data based on the review of the nurse's plan of care. The majority of physicians (six of nine) were not interested in changing or improving the interactional pattern with the nurse, while six of the nine nurses were interested in change. It was also demonstrated that distorted communications were promoted by both nurses and physicians.

Jones (1991a; 1991b) examined the nature of nurse-physician collaboration using four indicators: power-control, practice spheres, concerns, and goals. Registered nurses (N = 59, a 15% response rate) and physicians (N = 67, a 13% response rate) in a midwestern metropolitan county completed a random mail survey. Results indicated that nurses and physicians agreed on power-control measurements and on concerns. There were inconsistencies between nurses and physicians in regards to practice spheres and client goals. Demographics of nurses that were less collaborative were those that were between 32 and 42 years old and in charge nurse or team leader positions working in large government hospitals. Physicians that were between 51 and 72 years old, working in specialties with less direct nurse contact or in private hospitals were found to be less collaborative. These results must be interpreted with caution due to the low response rate.

Interdependence among physicians was studied by Sicotte, Pineault, and Lambert (1993). The researchers wished to determine whether interdependence among physicians led to coordination problems that in turn could explain variations in the use of clinical resources. Data on discrete episodes of in-hospital care were acquired from a chart review over 14 months at two mid-sized acute care hospitals. The three main clinical departments studied were surgery, internal medicine, and general practice. The total sample consisted of 6,841 episodes of hospital care evenly distributed between the two hospitals. The study determined that interdependence took place at a high rate, both in terms of complementarity and substitution. Team practice was not predetermined or planned, but was a more fluid and evolving process that was adaptable to variations in client care needs. Morbidity was the largest single determinant of resource utilization. It was also noted that teamwork becomes less efficient as interdependence increased.

King and Lee (1994) sought to examine the extent to which Navy nurses and physicians perceive that collaboration exists and its use in the intensive care unit. A comparative survey was

used in the Navy's four teaching hospitals and two hospital ships. Data was collected over a six-month period of time during the time of US military operations in Southwest Asia. Of a possible 196 physicians and nurses, 139 responded for a 71% response rate (90 nurses and 49 physicians). Results revealed a significant difference in the perceptions of collaborative practice behavior between nurses and physicians. Physicians reported that collaborative practice existed to a greater extent than did the nurses. The lack of random selection of subjects was a limitation.

Decision Making

The effect of collaboration on decision making was examined by Prescott and Bowen (1985) who questioned physicians and nurses regarding the nature of their relationship, areas of disagreement related to client care and how disagreements are resolved. During 1981 and 1982 data were collected from physicians and nurses in 15 general hospitals from six metropolitan areas. Within each hospital six patient care units were selected for study. Three staff nurses, two physicians, the head nurse, and nursing supervisor of each of the 90 units were interviewed and completed questionnaires. Additionally, 264 staff nurses and 180 physicians were interviewed and 1,044 staff nurses (68% response rate) and 536 physicians (58% response rate) completed questionnaires. Results indicated that 65% of the physicians and 53% of the nurses reported that disagreements were resolved by competition. Few examples of collaboration were noted. Physicians and nurses disagreed on elements of positive relationships. Physicians emphasized the need for the nurse to communicate with the physician, exhibit a willingness to help, and demonstrate competence. Nurses, on the other hand, felt that mutual respect and trust constituted positive relationships.

In a related study (Prescott, Dennis, & Jacox, 1987) a subset of 150 nurses, 68 head nurses, 49 nursing supervisors and 111 physicians were used as the sample to study nurse satisfaction with clinical decision-making behavior. The research team spent a week at each of the hospitals collecting data from hospital records, distributing questionnaires, and conducting semi-structured, tape-recorded, 30-60 minute interviews. The findings from this study revealed that nurses' level of autonomy varied from unit to unit and hospital to hospital. Physicians perceived a lack of value about nursing decisions and expected nurses to assume more responsibility in those areas of client care that were described as routine or boring. In terms of decision making, nurses focused primarily on collecting information, identifying problems, giving information, and making suggestions to the physicians, which are in the earlier stages of decision making. Physicians selected the course of action; i.e., the critical element in decision making. They also valued the involvement of nurses in the process, but did not label them as decision makers.

Baggs and Ryan (1990) designed a study to determine the importance of collaboration to satisfaction of nurses working in intensive care. The setting was the Medical Intensive Care Unit (MICU) of a large northeastern university medical center. All 68 registered nurses during the 6-month period of data collection completed the questionnaires. Results indicated that general nurse satisfaction scores did not correlate with collaborative practice. However, a statistical significance between job satisfaction and decision making was reported. Decision making was also related to retention. Generalizability was limited due to the fact that the study was conducted in one setting.

Porter (1991) studied the utilization of four types of interaction between nurses and doctors in decision-making processes. Unproblematic subordination, informal covert decision making, informal overt decision making and formal overt decision making were studied by observing interactions between nurses and doctors working in an intensive care unit and a general medical ward in a large, modern, metropolitan hospital in Ireland over a three month time frame. It was revealed that unproblematic subordination and informal covert decision-making interaction patterns were used frequently, but that nurses were less dependent on these subordinate modes of interaction than the literature suggests.

Outcome

This final section deals with the literature that discusses the role of collaboration and its effects on outcomes. Outcomes will be reviewed in terms of provider satisfaction and client health outcomes. Other items of interest will include cost and quality of care data.

Provider Satisfaction. Job satisfaction of 144 female registered staff nurses in four East Coast metropolitan hospitals was measured using an 18-item Likert-type instrument. Results indicated that four statistically independent dimensions emerged with relationship orientations accounting for 24% of the total variance (Everly & Falcione, 1976).

In 1983, McClure, Poulin, Sovie, and Wandelt identified a national sample of magnet hospitals and then conducted group interviews with directors of nursing and staff nurses. Out of a total of 165 nominated hospitals, 41 were selected as meeting the criteria for magnet hospitals. Results demonstrated that when staff nurses were asked about nurse-physician relationships, they stated that their satisfaction on the job was a result of the nature of those relationships. They recognized the need for improved relationships as well as that there would always be differences.

Pike (1991) in her evaluation of the unit 7 Gryzmish (see also Koerner, Cohen, & Armstrong, 1985), reported that an unexpected favorable outcome of collaboration was a reduction in, what she terms, moral outrage among nurses when faced with moral dilemmas. She

attributed the reduction of these incidents to mutual trust and respect and the development of the synergistic alliance between nurses and physicians.

Alpert et al. (1992) studied a 14-bed unit designed on a model of collaboration. Positive nurse-physician relationships were valued and nurses and physicians rounded together daily. Clients were admitted to the unit based on their needs for intensive nursing care rather than solely on their medical diagnosis. Results revealed a statistically significant increase in the nurses' job satisfaction and an increase in client functional status on discharge.

Client Outcomes. The effects of collaboration on client health outcomes was studied. Bakst and Marra (1955) who conducted a two-year study to determine the medical care implications involved in an intensive home care service for cardiac clients. A team approach to home care was provided by a second-or third-year resident, nurses from the Visiting Nurse Association, and a medical social worker. Clients were randomly assigned to the treatment group or a control group. No personal contact was made with the control group after their discharge from the hospital. The treatment group consisted of 55 clients who were followed for 14,393 patient days. The control group consisted of 35 clients who were followed for 10,253 patient days. Results revealed no differences in re-admission rates between the treatment and control groups. However, the reason for re-admissions was significantly different. Exacerbation of cardiac symptoms occurred over four times more frequently for those clients in the control group.

Katz, Vignos, Moskowitz, Thompson, and Svec (1968) randomly assigned clients with rheumatoid arthritis to treatment and control groups in a study of effectiveness of multi-disciplinary care. Effectiveness was measured in physical, psychological, and social areas. During the one-year study, 98 regularly scheduled intake and quarterly multi-disciplinary conferences were held concerning the 20 clients in the treatment group, while no such conferences were held for the control clients. Also, 864 nurse visits were made to the experimental group, while 17 clients in the control group had no nurse visits. Significant differences in the experimental group were found. There were fewer deteriorations in activities of daily living, more improvements and fewer deteriorations in economic dependence and in clinical manifestations of disease activity. Of interest, was the increase in hospitalization of the treatment group. The treatment group was hospitalized for a total of 341 days, where as the control group was hospitalized for 140 days. These results should be interpreted cautiously, because the differences between the treatment and control group can be attributable to either the conferences or nurse visits, or both.

Christensen and Lingle (1972) found that a new pattern of team care did not promote better health outcomes. The Visiting Nurse Association tested a model of nursing care based on the team concept. Stroke and fracture clients were the focus of the study. Team Nursing consisted of the client, family, professional nurse, licensed practical nurse, and student nurse.

Non-Team Nursing was provided by licensed practical nurses. Results revealed that an increase in activities of daily living and client and nurse satisfaction were significantly improved in the Team Nursing group, but that other measured outcomes (client self-concept, disability, housework, client and family problems, range of motion) were no different. A major limitation was the fact that experimental groups were administratively chosen as randomization was not possible.

Nathanson and Becker (1973) studied the relationship of clinic structure and staff attitudes to quality medical records. Detailed chart audits were carried out in five child care clinics. Results demonstrated that the quality of charts was lower in clinics with predominantly patient care rather than teaching and research-oriented physicians, and higher where nurses assumed a major role. It was concluded that conditions that favor the sharing of information, particularly between physicians and nurses, were positively associated with quality medical charts.

In a review of the literature about the team approach to health care provision, Halstead (1976) made some general conclusions:

(1) Team care appeared to be more effective than the customary care provided to clients with chronic illnesses

(2) Functional status was improved or maintained

(3) there was improved control or less deterioration in the disease process

(4) an increase in utilization of some health care services was observed

(5) this increase in utilization was associated with increased health costs.

A hallmark study conducted by Feiger and Schmitt (1979) analyzed interaction data on four interdisciplinary health teams to see if the measures of collegiality correlated with differences in client outcomes. A residential facility providing minimal supervision of daily activities, meals, and medication to 300 residents with one or more chronic illnesses was the study site. A sub-sample of those clients with diabetes was selected for the study to evaluate changes in health status. The experimental group consisted of 30 clients and was divided among four teams. The experimental nurses and nutritionist (all female) were the same two nurses and nutritionist across the four teams. Each of the four teams had a different physician (all male). Interactions among team members were analyzed for frequency and length of comments and process categories. Results revealed that 31% of the interactions were initiated by physicians and 61% by nurses. The authors felt that this, in itself, did not indicate collegiality, but instead, was consistent with a hierarchical organization. Positive change in client outcome scores were significantly different across the four teams. There was no difference in overall change. The authors concluded that team functioning predicted client outcomes and that the physicians' approach was a likely source of the differences among the teams.

Reeder (1983) conducted a Hospital Interview Survey (HIS) in 433 hospitals representing 48 states, each with at least 50 beds. The relationship among collegiality, assertiveness, acquiescence, and client care practices in regards to infection control were measured. Interviews were conducted with selected hospital members and 7,188 staff nurses completed self-administered questionnaires. A sub-sample of 345 hospitals and 5,435 nurses provided the data for this report. Results supported the hypothesis that collegial relations and the self-perception of assertiveness were significantly related to increased rigor in client care practices.

Rubenstein et al. (1984) conducted a formal randomized controlled study to test the effectiveness of a geriatric evaluation unit. The unit consisted of 15 beds on a 29-bed ward in the intermediate care area of the hospital. The health care team consisted of a physician, a fellow, a physician assistant, a social worker, and a group of nurses and nursing assistants. In the first week of admission, the client was assessed for medical, psycho-social, and functional status. A week later, the team finalized a treatment plan. Clients were then assigned randomly to either the unit or to the control group. The interdisciplinary team met weekly to discuss the plan of care and the client was followed for two years with reassessments three, six, nine, 12, 18, and 24 months after random assignment. Results indicated a significant difference in mortality rates between the two groups. In the experimental group, 23.8% of the unit clients died, as compared with 48.3% of the control group. A higher percentage of unit clients were discharged to their home or to a board-and-care facility (73% vs. 53.3%), whereas more control clients were discharged to a nursing home (30.0% vs. 12.7%). Fewer unit clients were readmitted (34.9% vs. 50%) and spent fewer days re-hospitalized on average (17.4 vs. 23.2 days) during the first year. This study was conducted in a Veterans Administration Hospital with a male-predominant population and prepaid system, which limits its generalizability.

Wood-Dauphinee et al. (1984) conducted a randomized controlled trial to examine the effects of interdisciplinary team care on acute hospitalized stroke clients' survival, motor performance, and functional abilities. Stroke clients (N = 130) were stratified and randomly assigned to either traditional or team care. Team care consisted of housestaff, resident, primary nurse, physical therapy, occupational therapy, speech therapy, and social services. Between three to five days after symptom onset, measures of motor performance and functional status were made. At five weeks after the stroke, measures were made of motor performance and independence in activities of daily living. For motor performance, male clients performed better with team care and female clients fared better with the traditional approach. In terms of functional abilities, male clients receiving team care again performed better than their traditional counterparts. There was no difference for functional status in females between team or traditional care. Team and traditional clients had similar survival rates. However, when gender was

considered, females had a poorer survival rate than males regardless of team or traditional approach.

Koerner et al. (1985) prospectively evaluated the impact of collaborative practice on increased client satisfaction, number of referrals, teaching plans, and discharge plans. They hypothesized that the system would decrease length of stay, mortality, transfers to intensive care, cardiac arrests, laboratory tests ordered, and intravenous therapy days. Adult medical clients on two 27-bed medical units of a 1,000-bed teaching hospital in Connecticut were studied. Both units were similar in terms of staffing ratios, clients, support services, budgets, and policies. One unit (7 Gryzmish) was established as the Collaborative Practice Unit (CPU). The other unit implemented care based on a team nursing approach. A sample of 180 clients on the CPU and 100 clients on the Team Nursing Unit were surveyed over a one year period. Results revealed that client-provider interactions were significantly improved on the CPU as compared to the Team Nursing Unit. Clients perceived a significant difference in the quality of care, health education, knowledge of practitioners, and the environment as well. However, when a random sample of client records were audited, the only outcome variable that was different was the number of client teaching plans; the Team Unit had more than the CPU. It was concluded that collaborative practice did not impact the selected outcomes.

In evaluating cost data, Koerner and Armstrong (1984) reported that the CPU had lower costs than the comparison unit. Greater system efficiency and more productive use of payroll hours worked by registered nurses, licensed practical nurses, unit secretaries, and nursing aides was noted. The total number of hours worked on the CPU decreased 2.1% despite an increase in discharges and fewer client days, indicating greater efficiency. On the Team Unit, the number of hours worked increased 2.6%, even though there was a reduction in volume and turnover of clients.

Knaus, Draper, Wagner, and Zimmerman (1986) prospectively studied treatment and outcome in 5,030 clients in intensive care units at 13 tertiary hospitals to determine if the degree of coordination influenced intensive care effectiveness. A questionnaire was completed by each unit's medical or nursing director that included issues on staffing, organization, policies, procedures, educational affiliation, and the extent of the critical care personnel's participation in client care. Demographics, therapeutic intervention scores, Acute Physiology and Chronic Health Evaluation (APACHE) II scores, and individual risk of death using diagnoses were collected on each client. Actual and predicted death rates were then compared using group results as the standard. Results revealed that one hospital had significantly better results with 68% fewer deaths, while another hospital had significantly inferior results with 58% more deaths than predicted. These differences were related more to the interaction and coordination of each hospital's intensive care unit staff than to the unit's administrative structure, amount of specialized

treatment offered, or the hospital's teaching status. Admitted limitations were the reliance on hospital mortality rates and possible biases in client selection.

Zimmerman et al. (1993), in an effort to systematically assess those factors that might be associated with superior ICU performance, studied the organizational and managerial practices of nine units. The study involved 3,672 ICU admissions, 316 nurses and 202 physicians. The researchers' observations of culture, leadership, coordination, communication and problem-solving did not distinguish between the higher and lower performing units based on predicted or actual mortality rates.

Williams, Williams, Zimmer, Hall, and Podgorski (1987) conducted a randomized controlled clinical trial to evaluate the effectiveness of a team-oriented geriatric assessment approach compared to traditional care. Subjects (N = 117) were randomly assigned to receive a comprehensive geriatric assessment by a multi-disciplinary team or by one of a panel of community internists who were reimbursed according to their usual customary fee. Clients (treatment group n = 58, control group n = 59) received care from a team of health professionals including internists and family physicians, psychiatrists, nurses, social workers, and nutritionists. Clients were assessed initially, at the four, eight, and 12 month point to determine the client's location, level of functioning, and provisions for care. Results revealed that the treatment group experienced 26 hospitals admissions with 670 hospital days compared with 23 admissions and 1,113 hospital days for the control group. Annual hospital costs averaged $4,297 for treatment subjects and $7,018 for controls. The treatment group demonstrated an average savings of $2,189 per person (a 25% reduction) for institutional costs including hospital and nursing home care. No differences were noted in client or provider satisfaction, functional ability, or health status. Limitations included a question about monetary incentives for the control group providers and differences in support systems between the treatment and control groups.

Mitchell, Armstrong, Simpson, and Lentz (1989) reported on the American Association of Critical Care Demonstration Project's results. The project was designed to document fiscal costs and patient care effectiveness of critical care nursing. Interviews, observations, and written surveys were conducted with 42 nurses (82% response rate), 68 physicians (100% response rate), and 192 client admissions (42% of all admissions) in a special care unit in a 261 bed, nonprofit, community-based hospital. The experimental unit was a 10-bed mixed medical-surgical intensive care unit and the control unit was a seven-bed coronary care unit. Nurses and physicians agreed that collaboration was high and the method of coordination used most was informal information exchange. Mortality rates were significantly less on the demonstration unit. High client satisfaction and no new complications were also reported. The subjects for this study were not a probability sample and, thus, the results have limited generalizability.

Baggs, Ryan, Phelps, Richeson, and Johnson (1992) prospectively studied the relationship between nurse and resident collaboration regarding decision making about client transfers and client outcomes in the Medical Intensive Care Unit (MICU). Re-admission to the MICU or death was considered a negative outcome. Consecutive client admissions (N = 286) meeting certain criteria, registered nurses (N = 56), and medical residents (N = 31) composed the sample. Severity of illness was measured using the APACHE II which is specific for intensive care unit clients. Data were collected from client charts and by questionnaires completed by the staff during the work shift when a client was to be transferred. Results revealed that when nurses reported no interdisciplinary collaboration in decision making, the risk of negative outcome for clients was 16%. When the nurse reported full collaboration, the risk of negative outcome was 5%. Nurses' reports of collaboration were significantly associated with client outcome, whereas residents' reports of collaboration were not. The authors discussed the fact that collaboration apparently had different meaning for nurses and physicians. The fact that this study was conducted in one type of unit in one hospital was its limitation.

Major Findings

The literature on collaboration is diverse and can be divided into studies on structure, process, and outcome variables. Organizational structure produced varying results. Increased competency, efficiency, cooperation, and mutual respect are reported in one study (Devereux 1981a; 1981b), while another study found that although different disciplines did not collaborate well, they report that there is a high sense of teamwork (Carter-Jessop et al., 1982). In one study, the more experience a nurse has, the less he/she collaborates with a physician (Alt-White et al., 1983).

Communication among different health care providers has not reached its potential. Communication remains limited among providers and hinders accomplishment of work (Bates, 1966; Bates & Kern, 1967; Duff & Hollingshead, 1968; Prescott & Bowen, 1985). Although physicians tend to consult with their peers rather than other providers (Lamb & Napodano, 1984; McLain, 1988; Simborg et al., 1978), consultation with other providers does not correlate with higher levels of collaboration (Radka, 1984). In fact, when communication is measured among physicians, nurses, and consumers, no positive change in collaborative beliefs occur as a result of dialogue (Weiss, 1985; Weiss & Remen, 1983). Interestingly, physicians report collaborative practice more often than nurses (King & Lee, 1994; McLain, 1988).

Collaboration is positively correlated with satisfaction levels and negatively correlated with turnover of health care professionals (Alpert et al., 1992; Baggs & Ryan, 1990; Everly & Flacione, 1976; McClure et al., 1983; Pike, 1991; Stichler, 1990). It also influences client satisfaction (Devereux, 1981a & 1981b; Koerner et al., 1985; Mitchell et al., 1989).

Collaboration is also reported to influence functional outcomes of clients. Collaborative approaches to caring for cardiac, geriatric, rheumatoid arthritis, diabetics, intensive care, and hospitalized stroke clients yield positive health outcomes and cost savings (Baggs et al., 1992; Bakst & Marra, 1955; Feiger & Schmitt, 1979; Katz et al., 1968; Knaus et al., 1986; Koerner et al., 1985; Mitchell et al., 1989; Reeder, 1983; Rubenstein et al., 1984; Williams et al., 1987; Wood-Dauphinee et al., 1984).

Major Limitations

The collaboration literature does not address primary care practices nor providers of all types (physicians, nurse practitioners, and physician assistants). Studies were usually conducted in a single setting with small sample sizes and relied on self-report of collaborative behaviors (Alt-White et al., 1983; Beloff & Willet, 1968; Hughes, 1988; McLain, 1988; Paterson & Peacock, 1995; Radka, 1984; Stichler, 1990; Wonstetler, 1987).

## Results

Characteristics of the Collaboration Variable

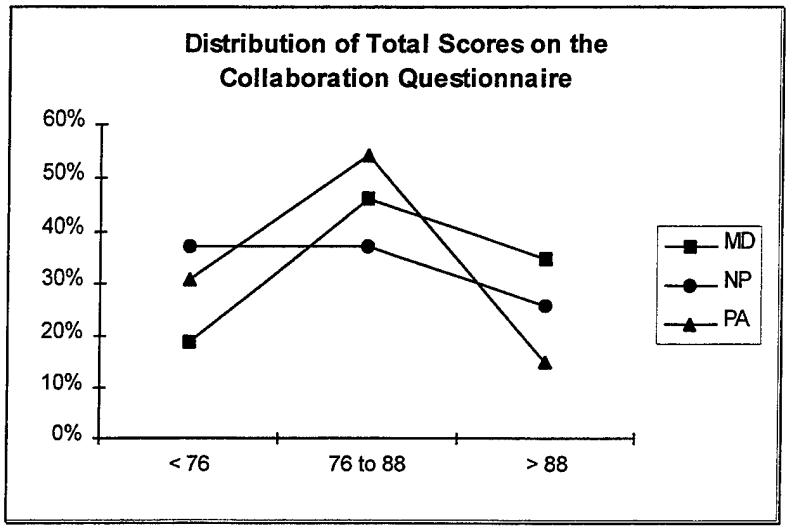
The objective of this portion of the data analysis was to describe the nature of the data collected on provider collaboration. For these analyses, providers were divided into three groups on the basis of their professional credential (physician, nurse practitioner, physician assistant). Descriptions of the basic demographic characteristics of the sample are provided in Chapter 1. Results of the analysis of the differences among provider types in experience and utilization are described in Chapter 2. Results of the analysis of the reliability and validity of the autonomy questionnaire are described in Chapter 9.

Frequency analysis of items on the collaboration questionnaire (see Appendix A) revealed an extraordinarily high degree of agreement among providers on most items (i.e., they rated items as "true most of the time" or "always true"). The exceptions to this finding were items concerned with "my input is truly valued," "we make an effort to resolve conflicts," "we problem solve together," and "we recognize the need to have 'give and take' in the relationship." Providers were essentially equally divided among ratings on these items (11, 14, 17, and 18). Unfortunately, these items form the core of true collaboration among individuals of different status and education (as distinguished from simple teamwork or participatory management).

Total scores on the collaboration questionnaire ranged from 52 to 100. A score above 88 indicated a strong sense of participation, interdependence, and mutual respect. A score of less than 76 indicated segregation and estrangement. Figure 4-1 illustrates the distribution of scores on the collaboration variable. Mean total scores on the collaboration questionnaire were 84.12,

80.47, and 80.00 for MDs, NPs, and PAs, respectively. A one-way analysis of variance was used to determine whether mean differences among the three groups of providers were statistically significant. Groups were not significantly different, indicating that no specific provider group felt isolated, but that individuals in each group did.

**Figure 4-1**




Intercorrelations of Practice Style Variables

The objective of this portion of the data analysis was to quantify the relationships among practice style variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 4-1 provides the intercorrelation matrix of these variables. It is clear from the data in Table 4-1 that there was a good deal of overlap among the practice style variables. There was a strong positive correlation between collaboration and three of the other five practice style variables: autonomy, information giving, and job satisfaction. The association of autonomy and collaboration seemed straightforward. The more autonomy a provider has, the more likely he or she is to have relationships with other providers that are truly collaborative (as opposed to supervisor-subordinate, mentor-mentee, or preceptor-preceptee relationships). The two variables, collaboration and information giving, may represent two dimensions of a single construct: collaboration with peers versus collaboration with clients. Providers who value collaboration in one setting are more likely to value it in the other as well, hence the positive correlation. Given the nature of collaboration (as operationally defined by the questionnaire used in this study, i.e., mutual respect and joint-problem solving), it is not surprising that collaboration and job satisfaction were strongly related. Although the role of collaboration in influencing job satisfaction has not been well-studied, the existing literature supports the hypothesis that collaboration is correlated with job satisfaction.

**Table 4-1**
**Intercorrelation Matrix of Practice Style Variables**

| N = 58 | Practice Model | Confidence | Autonomy | Collaboration | Information Giving | Job Satisfaction |
|---|---|---|---|---|---|---|
| Practice Model | 1.00 | | | | | |
| Confidence | 0.38 | 1.00 | | | | |
| Autonomy | 0.35 | 0.41 | 1.00 | | | |
| Collabor-ation | 0.32 | 0.25 | 0.56 | 1.00 | | |
| Information Giving | 0.41 | 0.36 | 0.52 | 0.43 | 1.00 | |
| Job Satisfaction | 0.28 | 0.23 | 0.54 | 0.45 | 0.30 | 1.00 |

The analyses presented in this chapter form the basis for an understanding of how collaboration was viewed in the provider sample. Chapter 6, 7, and 8 describe the results of analyses of the impact of provider practice style on client outcomes.

## Conclusions

(1) The collaboration data were quite positive in that there was a general consensus across all three types of providers that providers worked together as a team, sharing information and expertise. The average level of collaboration was not significantly different across the three types of providers.

(2) Congruent with the results of previous research, there was substantial diversity of opinion among providers concerning whether genuine collaboration (mutual respect and joint problem-solving) routinely occurred. However, this diversity was not a function of provider type, as might be expected from previous research.

(3) Interestingly, collaboration scores were positively correlated with job satisfaction scores. That is, those providers who reported high levels of collaboration, including mutual respect and joint problem-solving, reported high levels of job satisfaction and those who reported low levels of collaboration reported low levels of job satisfaction.

(4) Collaboration scores were positively correlated with autonomy scores, a finding that was predictable given the research on interdependence and autonomy.

(5) Collaboration scores were positively correlated with information giving scores. Although this relationship has not been investigated before, it is likely that it is an indication that collaboration with peers generalizes to collaboration with clients.

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# CHAPTER 5
# PROVIDER SATISFACTION

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## Introduction

The aim of this study is to examine physician, nurse practitioner, and physician assistant job satisfaction in primary care clinics and its relationship to client outcomes (functional status, health status, and satisfaction). Physician satisfaction has been studied in both the civilian and military setting, whereas job satisfaction of nurse practitioners and physician assistants practicing in primary care settings has not.

Provider satisfaction is a critical determinant of job performance and, therefore, the process of care. Examination of provider satisfaction explores the health care provider's perception of the profession and the job. In addition, provider satisfaction predicts retention and recruitment.

Knowledge of provider satisfaction offers insight into the provider-client relationship and other components associated with the process and quality of care. There is evidence that physician satisfaction affects client satisfaction (Greene, Adelman, Friedmann, & Charon, 1994; Linn et al., 1985). Several studies indicate that the single most satisfying aspect of medical practice is the physician-client relationship .

Systems for the delivery of health care are in a period of transition in both civilian and military health care settings. Health care providers are faced with different ways to deliver health care, increased workloads, and concerns about cost of treatment. These changes are often associated with job stress. All of these changes can lead to provider dissatisfaction and disrupt the process of care. Obtaining information about how health care providers perceive their work is critical to the improvement of work conditions and overall quality of care.

America is faced with a shortage of primary care providers (Pew Health Care Commission, 1994; Rivo, Mays, Katzoff, & Kindig, 1995). The military provides an excellent training ground for physicians, nurse practitioners, and physician assistants. Not only does the military setting offer unique clinical experiences, but the organization provides funds to providers to continue their education. It is a waste of money and talent when providers leave the military because they are dissatisfied with their work in the military setting. Steinweg (1994) examined career retention rates for the Army Family Practice residency program from 1973 to 1990. The sample consisted of 607 graduates. The retention rate for the family practice graduates as Army career family practice physicians was 21.1%. Predictors of retention were prior service, United States Military Academy attendance, Uniform Services University of the Health Services (USUHS) attendance, and fellowship training. An analysis of these four predictors revealed that graduates who had at least one predictor of retention had career retention rates of 66%. Those graduates

who did not have at least one predictor variable typically left the Army after completing their service obligation. Each lost graduate costs the Army, from $500,000 to $800,000.

Provider dissatisfaction inhibits recruiting future providers. When providers are dissatisfied with their job, they discourage others from choosing health care as a career. In a day when there is already a shortage of primary care providers, delivery of health care can not risk a severe shortage of primary care providers.

The majority of physician studies were done on civilian physician samples covering all types of practice settings. Only a few studies address military physician samples. The nurse practitioner and physician assistant studies used civilian samples, usually studying recent graduates of nurse practitioner or physician assistant educational programs. The following analysis of the research on provider job satisfaction was examined from the perspective of content of work, the work setting, provider demographics, and personal characteristics. The content of work involves variables associated with the practice of the provider, such as provider-client interaction. The work setting factors are organizational variables as well as the physical environment of the practice setting, such as form completion. Provider demographics include age, gender, and attitude. Personal characteristics include providers' motivation and expectations.

## Literature Review

### Physician Job Satisfaction

Physician satisfaction has been studied for several decades with emphasis on the work setting. Only lately has the focus of physician satisfaction changed to the content of work or the process of care. Mangelsdorff and Hubbart (1976) examined physician satisfaction with military medicine. The sample consisted of 1,376 physicians. Although the survey revealed overall satisfaction with military medicine, there were some interesting findings. The more years of service the physician had in the military, the more satisfied the respondent was with being a military physician. The physicians were most satisfied with pharmacy services and the quality of military medicine at the institution stationed. They were least satisfied with the number of examining rooms available to them and the number of ancillary personnel available.

Breslau, Novack, and Wolf (1978) examined physician and non-medical staff member job satisfaction in solo practice, group practice, and a health maintenance organization . The sample included 70 teams (1 physician and their paramedical personnel). Interestingly, the work setting clearly influenced job satisfaction. The physicians in solo and group practice were more satisfied than physicians in a HMO. Length of client visit was a factor related to job satisfaction. The longer the client visit, the greater the satisfaction was for physicians in solo or group practice. An

inverse relationship was found for length of client visit for the HMO physicians. The longer the client visit was, the less job satisfaction was reported by the HMO physicians. Paramedical personnel practicing in solo or group settings reported less satisfaction when routine technical activity was delegated to them, while paramedical personnel in a HMO had greater job satisfaction when tasks were delegated to them. Independent of income, these researchers found that physicians' work satisfaction was similar to the work satisfaction of the paramedical respondents.

McCranie, Hornsby, and Calvert (1982) examined practice and career satisfaction among residency-trained family practice physicians. The sample in this study consisted of 876 physicians with the majority of physicians practicing three years or less. Most of these physicians were satisfied with their work (especially their hospital privileges), respect received from clients, adequacy of residency training, relationship with consultants, and adequacy of office support. The respondents were least satisfied with practice time requirements, time available for family, leisure, and continuing medical education, and costs associated with running a practice. Physicians in practice for four to seven years were more likely than those in practice for less than two years to be satisfied with the organization and management of their practice. Physicians in group practice were more satisfied with practice requirements than those in private solo practice.

Lichtenstein (1984) reviewed the literature related to physician job satisfaction and retention in organized settings. He reported that physicians in solo and small group practices had high satisfaction with their jobs while the lowest satisfaction rates were in governmentally operated systems and pre-paid groups. The major variable that influenced satisfaction was physician autonomy. The more bureaucratic the setting, the less satisfied the physicians were with their autonomy and jobs. Physicians in pre-paid groups or other salaried positions were very satisfied with their hours of work, while physicians in private practice were less satisfied with their hours of work. Salaried physicians were dissatisfied with the types of demands that clients made on them. These physicians perceived a high proportion of client visits as unnecessary, while the physicians in solo/group practice did not have this complaint. Salaried physicians were very satisfied with their interaction with colleagues, while physicians in solo/group practice had less satisfaction with the degree of collegial interaction. Physicians in pre-paid group practice were less satisfied than other physicians with the time available per client, community status, and esteem.

Linn et al. (1985) compared client satisfaction with provider job satisfaction. There were 1,600 outpatients in this study, 120 physicians, and 681 residents. They found when clients were satisfied, so were the residents, staff physicians, and faculty physicians. Higher physician satisfaction was also associated with greater continuity of care, lower client no-show rates, and more reasonable charges for routine and follow-up visits. The house staff were also satisfied with

the efficient use of human resources. The physicians and housestaff were satisfied with continuity of care.

Makin, Rout, and Cooper (1988) studied job satisfaction and job stress among general practitioners. The sample consisted of 101 British physicians. The highest level of job satisfaction was associated with intrinsic factors, such as the freedom to choose the method of work, the amount of responsibility, and the variety of work. Sources of stress were negatively related to overall job satisfaction. The greatest sources of stress were: interruptions of various kinds, emotional involvement with clients, administrative workload, routine medical work, and work/home interface. The physicians in this study also experienced esteem problems related to lack of recognition and praise from clients or colleagues.

Groenewegen and Hutten (1991) conducted a literature review of workload and job satisfaction among general practitioners. These authors highlighted the relationship between workload and quality of care. They reported that a high workload created stress and time pressures on the general practitioner. Therefore, the consultation was shorter, a lower quality of interaction between physician and client existed, fewer client problems were detected, and as a result, quality of care was affected. The way the practice organization was established affected management of workload which influenced satisfaction. A physician's work orientation and task perception were important because of the way time was allocated to the physician's work. Satisfaction was gained when physicians managed their workload effectively.

Lewis, Prout, Chalmers, and Leake (1991) surveyed 1,290 members of the American College of Physicians to examine physician satisfaction with internal medicine practice. Over 80% of the physicians were satisfied with their relationships with clients, professional challenges, and interacting with colleagues. Only half of the physicians were satisfied with their salary. Most of the physicians were dissatisfied with their autonomy level in the areas of clinical decision making, litigation, and administrative burdens. Forty percent of the physicians would discourage students to pursue a career in internal medicine and only 39% of the physicians would choose medicine as a career again.

Schulz, Girard, and Scheckler (1992) examined physician satisfaction in a managed care environment. A sample of 545 physicians were surveyed. Sixty-nine percent of the physicians were very satisfied or satisfied with their practices in organized settings. Older physicians were more satisfied with their work than younger physicians. Perceived clinical freedom was a strong and positive predictor of job satisfaction; HMO affiliation had a negative relationship. Female physicians were less satisfied with status as compared to male physicians. Physicians working in primary care were not satisfied with their salary; although surgeons were. In this study physicians in solo or group practice reported less job satisfaction. However, solo and small group practitioners were under-represented in this sample.

Sutherland and Cooper (1993) examined stress and job satisfaction among general practitioners. A random sample of 917 general practitioners in England completed a mailed survey (61% return rate). Male practitioners were significantly more anxious and depressed than a male normative sample, whereas, female practitioners were similar to a normative female sample. The main predictors of dissatisfaction included pressure associated with the demands of the job and client expectations. Other factors associated with job dissatisfaction were the organizational structure and climate, home/work interface, career and achievement, routine medical work, and practice administration. The low use of social support as a coping strategy was also related to reported job dissatisfaction. Females, more than males, used home/work relationships as a coping strategy.

Suchman, Roter, Green, Lipkin, and the Collaborative Studies Group of the American Academy on Physician and Patient (1993) studied physician satisfaction with primary care office visits. The sample was composed of 124 physicians and residents and 527 clients. Exit questionnaires were collected from clients and physicians. The results of the study included the following. Physician satisfaction with the physician-client relationship was the most important factor related to global job satisfaction. Other factors associated with physician satisfaction were the appropriate use of time and whether the client was cooperative and undemanding. The client's emotional distress was negatively associated with satisfaction.

Kravitz, Thomas, Sloss, and Hosek (1993) surveyed military physicians regarding satisfaction and dissatisfaction with military medical practice. The sample consisted of 1,197 physicians who were typically male, Caucasian, under 40, and board certified. The three branches of the military were represented: 35% Air Force, 34% Navy, and 31% Army. Eighty-three percent of the physicians were very or somewhat satisfied with the professional abilities of their peers; 59% were satisfied with their ability to practice medicine according to their own best judgment; and 68% were satisfied with the quality of care they were able to provide. They were least satisfied with salary, quality of clerical support, and the ability to help form policies at their current facility. Higher global satisfaction was associated with lighter workload, decreased working hours, fewer outpatient visits per week, and less time spent on call. The physicians were satisfied with the level of their technical autonomy.

Skolnik, Smith, and Diamond (1993) examined professional satisfaction and dissatisfaction of family physicians. The sample in this study consisted of 1,066 physicians in full-time family practice. A questionnaire was mailed to all physicians in the state of Pennsylvania who were listed in the directory of the American Board of Family Practice. The response rate was 68%. Results indicated that 65% of the physicians were satisfied with their client relationships, clinical competence, and relationships with other physicians. Dissatisfaction was associated with regulations by third party payers, governmental agencies, paperwork associated with practice,

income, and lack of leisure time. Significant differences in satisfaction occurred among physicians in different practice arrangements. Academic physicians were the most satisfied, followed by those in a small or large group practice, and, finally, physicians in solo practice. Three factors demonstrated significant differences among practice types. These factors were intellectual stimulation associated with the daily practice of medicine, amount of leisure time, and satisfaction with their professional lives.

Baker and Cantor (1993) examined physician satisfaction. The sample consisted of 4,257 physicians who were young (less than 45 years of age) and inexperienced (between two and nine years of practice experience). The study variables included perceived professional autonomy in practice and career satisfaction. Physicians practicing in managed care settings had lower levels of perceived autonomy in client selection and time allocation. These physicians also had higher levels of perceived autonomy in the use of hospital care, diagnostic tests, and procedures. Specialists in managed care settings perceived greater autonomy than generalists. HMO physicians were less satisfied than self-employed physicians, but not noticeably less satisfied than physicians of other employers. Generalists employed by HMOs were the least likely to choose medicine again and were the least likely to feel that their level of professional autonomy met or exceeded their expectations. Generalists were more satisfied with their ability to practice high-quality medicine than other physicians. Specialists employed by HMOs were more satisfied than generalists. Physicians employed by the government were the least satisfied on any of the satisfaction measures.

Mainous, Ramsbottom-Lucier, and Rich (1994) investigated the role of clinical workload and physician satisfaction in a rural setting. Physicians ($\underline{N}$ = 373) practicing in rural areas, younger than forty years of age, out of residency less than seven years, and working full-time were surveyed by telephone. Twenty-five percent of physicians were somewhat or very likely to leave the practice within the next two years. Forty-nine percent of the physicians were dissatisfied with their workload and working too many hours. The physicians who were dissatisfied with their workload were more likely to leave the practice. Those physicians who were employees rather than owners were more likely to leave the practice. The last predictor for leaving the practice was having older children; the physicians with children under the age of six years were most likely to stay in the practice.

Blount et al. (1995) surveyed the satisfaction of Army family practice physicians. The sample consisted of 274 active duty family practice physicians. Ninety-two percent of the physicians were satisfied with being a family practice physician. The amount of time spent in patient care and the number of clients seen each week were negatively associated with satisfaction as a physician. The physicians age and time spent in administration were positively associated with satisfaction as an officer. Participating in Health Professional Scholarship

Program was negatively associated with satisfaction as an officer. The higher the rank of the respondent, the more satisfied the physician was with the military. This is not surprising given that increasing rank provides increasing control over the environment and task autonomy. Moreover, rank was positively associated with longevity in the military system and so may reflect a self-selection bias.

Stamps (1995) surveyed physicians in managed care settings to determine their job satisfaction. The sample consisted of 908 physicians in solo, group, HMO, or hospital-based practice. All of these physicians completed a mailed questionnaire. All physicians were satisfied with the personal and lifestyle factors related to their practice setting. Physicians in the private group practice were more satisfied than other respondents. Physicians from hospital-based and HMO practices were more satisfied with medicine as a profession than those in solo or group practice. Physicians from HMOs had the lowest mean annual salaries, but were the most satisfied with their income.

Nurse Practitioner and Physician Assistant Job Satisfaction

There are some similarities between physician and nurse practitioner satisfaction with the content of work. However, nurse practitioners' perceptions of the work setting are different from the physicians' perceptions. One of the first nurse practitioner studies related to work satisfaction was done by Bullough (1974). Bullough examined the work satisfaction of both nurse practitioners and registered nurses. The sample consisted of 17 nurse practitioners, 18 extended role nurses, and 38 registered nurses. The aspects of job satisfaction that were explored in this study included achievement, recognition, interesting work, responsibility, and advancement. The results indicated that nurse practitioners had significantly higher levels of intrinsic job satisfaction than the other two groups. The nurse practitioners perceived the advanced nursing role as requiring more creativity, greater use of skills, and more responsibility. The nurse practitioners found the job more interesting and challenging than the other groups. When examining overall satisfaction, all three groups of nurses were moderately satisfied with their jobs. The registered nurses indicated that they would choose nursing again as a career, while nurse practitioners were uncertain about choosing the practitioner role again. This finding supported the idea that nurse practitioners were satisfied with the content of work, but were ambivalent about factors related to the work setting.

Riess and Lawrence (1976) studied the job satisfaction of nurse practitioners and physician assistants in remote areas of the Pacific Northwest and Alaska. Included in this sample were eight nurse practitioners and five physician assistants. The majority were satisfied with remote practice. The areas of job satisfaction for both groups included being self-reliant and independent, engaging in direct client care, helping people, applying one's training and

experience, the daily variety of activities, challenging aspects of the job, having prestige, and enjoying the community. The areas of dissatisfaction for both groups included isolation from other professionals, the seriousness of responsibilities, numerous time constraints, and financial insecurity. Those respondents scoring the highest dissatisfaction scores were young, single, and female.

Toffler (1977) examined nurse practitioners' and physician assistants' job satisfaction in the state of Connecticut. In the sample there were 66 health practitioners (29 NPs, 24 PAs, and 13 certified nurse midwives) and 50 supervisors who completed the questionnaires. The majority of the health practitioners practiced in a hospital/university clinic or HMO. The supervisors viewed both groups of providers in a complement role to physicians. Supervisors also reported that nurse practitioners spent an average of one to one and a half times longer with clients than physician assistants. Both groups of providers exhibited moderately high levels of confidence in themselves, worked interdependently, desired challenges, and sought learning situations. Both groups of providers were moderately satisfied with pay, independence, job security, and co-worker relations. Nurse practitioners reported significantly higher satisfaction with career advancement than physician assistants.

Celentano (1978) surveyed nurse practitioners and physician assistants about their career patterns and their job satisfaction. The sample was composed of 69 nurse practitioners and 47 physician assistants from one educational program. The nurse practitioners were employed an average of 21.4 months and the physician assistants were employed an average of 8.5 months. The physician assistants primarily worked in rural areas; the nurse practitioners worked in urban areas. The nurse practitioners engaged in more time teaching clients. Overall the satisfaction level for both groups of respondents was high. There was no relationship between the length of employment and satisfaction for either group. The length of employment was significantly related to perceived responsibility for nurse practitioners, but not physician assistants. Both providers showed a significant correlation between responsibility and the number of clients treated in a week. Physician assistants reported a strong positive correlation among responsibility, job satisfaction, and the proportion of time spent seeing clients without supervision. Physician assistants judged their level of responsibility and measured job satisfaction in terms of autonomous practice, while nurse practitioners defined the level of responsibility and job satisfaction on the basis of client workload and provision of primary care services.

Vacek and Ashikaga (1980) surveyed family nurse practitioner graduates and registered nurses to examine the advanced nursing role and satisfaction with the role. The sample consisted of 50 family nurse practitioners and 209 registered nurses. Analysis of the data revealed substantial differences between the two groups of nurses related to the advanced role. Nurse practitioners perceived their role as impacting clients by reducing their waiting time for health

services. In addition, nurse practitioners also viewed themselves as providing more client education than the registered nurses. Registered nurses were more satisfied with clerical activities and nurse practitioners were more satisfied with the ability to obtain information by interacting with the client, performing physical examinations, practicing preventive health, and ordering medications. Nurse practitioners overall satisfaction was higher than the registered nurses. Nurse practitioners were more concerned about applying knowledge and skills, having greater responsibility for clients, and addressing malpractice issues than the registered nurses.

Elder and Bullough (1990) compared the roles of nurse practitioners and clinical nurse specialists. The sample consisted of 57 nurse practitioners and 75 clinical nurse specialists. Both groups perceived their job as important. Eighty-eight percent were satisfied with the content of their work; 72% would choose the advanced nursing role again; 61% were moderately satisfied with cooperation from physicians and other nurses; 57% felt time-pressures at work, and less than 33% were dissatisfied with their salary. The nurses who were less likely to choose an advanced nursing role were more likely to be dissatisfied with their salary, frustrated with the time pressures of the job, and dissatisfied with the cooperation they received from co-workers.

Koelbel, Fuller, and Misener (1991a & 1991b) examined nurse practitioner job satisfaction. The sample consisted of 132 experienced nurse practitioners from one state. The findings of this study support the hypothesis that intrinsic factors were important determinants of job satisfaction. Nurse practitioners were moderately satisfied with their overall job. They were satisfied with the ability to provide a social service, the variety of the work, the moral values associated with the work, the job security, and the use of their skills. The areas of dissatisfaction related to work environment factors such as pay, opportunities for advancement, company policies/practices, recognition, and relationship with supervisors. Nurse practitioners with children or in a private practice setting, or both, scored higher on all job satisfaction scales. National certification correlated positively with global satisfaction and intrinsic job satisfaction. A higher salary was positively correlated with overall job satisfaction. Nurse practitioners with perceived high levels of client acceptance had greater amounts of job satisfaction. Nurse practitioners serving a smaller percentage of low-income clients had more job satisfaction than those serving a larger percentage of low-income clients. This dissatisfaction with low-income clients was due to the fragmentation of care and the difficulty establishing a rapport with these clients.

Tri (1991) investigated factors that contributed to nurse practitioner job satisfaction and dissatisfaction and examined the relationship between levels of job satisfaction and characteristics of work settings. The sample included 373 nurse practitioners who had a mean of seven years experience as a nurse practitioner and were board-certified. Overall, NPs demonstrated high levels of satisfaction, with 9% of them showing dissatisfaction with the job. Factors like autonomy, sense of accomplishment, and time spent in client care led to job

satisfaction, while low salary caused dissatisfaction. The number of years of experience and perceived skill level were important variables contributing to overall job satisfaction. Significant differences existed between novices and experts in relation to expression of personal creativity, degree of autonomy, amount of self-determination, provision of quality care, relationships with physicians, and enhancing clinical skills. There were also significant differences between intermediate and expert NPs related to autonomy. NPs with higher levels of satisfaction had worked longer, earned higher salaries, had an assistant, and worked full-time. It was clear that nurse practitioner experience, skill level, and salary were important predictors of job satisfaction.

Freeborn and Hooker (1995) examined nurse practitioner and physician assistant job satisfaction in a managed care setting. The sample consisted of 54 nurse practitioners and 58 physician assistants from the Northwest Region of Kaiser Permanente. The majority of physician assistants were men and the nurse practitioners were women. The nurse practitioners had a longer employment history with Kaiser HMO than the physician assistants. The results indicated that 67% of the physician assistants were satisfied with the HMO as a workplace and their current job; over 70% of the nurse practitioners were satisfied. In response to the question "would you take this job again," 33% of the physician assistants and 39% of the nurse practitioners answered positively. Both groups were satisfied with their pay and benefits. Both groups were most satisfied with the amount of responsibility, support from co-workers, variety in their jobs, job security, working hours, and their supervisors. Both groups were least satisfied with workload, lack of control over the work place, attitudes of physicians, and opportunity for advancement.

Perry (1976) studied physician assistant job satisfaction. This study had a sample size of 939 physician assistants from primary care and small community settings. He found PAs had favorable levels of job satisfaction. The strongest correlates of both job performance and satisfaction were the degree of supervisor support and the amount of responsibility for client care. Job dissatisfaction centered around limited opportunities for advancement.

Perry (1984) conducted another national survey of physician assistants to examine job satisfaction. The sample size was 4,822 physician assistants. PAs who had prior health experience had higher satisfaction scores than those with no health care experience. The PAs were most satisfied with client acceptance, level of responsibility, and acceptance by nurses and physicians. The lowest levels of job satisfaction pertained to income and limited opportunity for advancement.

Baker, Oliver, Donahue, and Huckabee (1989) explored physician assistant job satisfaction. The sample consisted of 165 physician assistants with an average of 3 years health care experience and a current job experience of 47 months. Gender differences existed. Males were older, had been employed in the profession longer, had worked in the current position longer, and earned higher salaries than the females. However, PAs were satisfied with their role.

They were most satisfied with the level of independence, responsibility for client care, supervisor and coworker support, and client acceptance. The PAs were dissatisfied with the lack of promotion, salary increases, and opportunity for career advancement. Dealing with clients' emotional problems and the emphasis placed on preventive medicine also created job dissatisfaction.

Holmes and Fasser (1993) conducted a national survey of physician assistants and examined occupational stress. The sample consisted of 1,360 physician assistants, who viewed themselves as happy, energetic, and optimistic. The highest reported levels of job stress were associated with dealing with emotional needs of clients, dealing with difficult clients, poor opportunity for advancement, inadequate salary, responsibility for client outcomes, maintaining clinical competence, and meeting society's expectations for quality care. The respondents were satisfied with providing a service to people, steady employment, doing tasks that did not go against individual conscience, independence, using clinical skills, and being free to use personal judgment.

Major Findings

All types of providers have moderate to high job satisfaction. Further analysis reveals that job satisfaction can be attributed to intrinsic factors pertaining to the content of work (Breslau et al., 1978; Bullough, 1974; Celentano, 1978; Freeborn & Hooker, 1995; Koelbel et al., 1991a & 1991b; Mangelsdorff & Hubbart, 1976; McCranie et al., 1982; Suchman et al., 1993; Toffler, 1977; Tri, 1991). Providers have different degrees of satisfaction with client relationships. When examining all three types of providers, differences emerge among professions.

Differences within medicine exist. For example, physicians in solo or group practice have greater job satisfaction when the client visit is longer, while the inverse is true for physicians in HMOs. Physicians in HMO settings and other institutions have lower perceived autonomy which reduces job satisfaction. Physicians working in the HMO setting are more satisfied with their work hours than physicians in solo or group practice (Breslau et al., 1978; Schulz et al., 1992; Stamps, 1995).

Physician dissatisfaction is the result of salary, workload, client demands, client emotional distress, interruptions, and routine medical work. Physicians who are working in HMOs and in primary care settings make lower salaries than their peers in private practice and in other specialties. Physicians in solo or group practice have substantial control over workload concerns, however, physicians practicing in institutional settings do not, and this is a source of job dissatisfaction. High workload and client demand create time pressure problems and concern for the quality of care are a source of physician job dissatisfaction. Encountering clients who experience emotional distress creates frustration and dissatisfaction (Baker & Cantor, 1993;

Breslau et al., 1978; Kravitz et al., 1993; Lewis et al., 1991; Mainous et al., 1994; Makin et al., 1988; McCranie et al., 1982; Schulz et al., 1992; Skolnik et al., 1993; Sutherland & Cooper, 1993).

Military physicians are moderately satisfied with their jobs (Blount et al., 1995; Kravitz et al., 1993; Mangelsdorff & Hubbart, 1976). It is interesting to note that the longer physicians stay in the military, the more satisfied they become with the role of the military physician. Similarly, the higher the rank the physician possesses, the more satisfied the physician is (Blount et al., 1995). Military physicians are satisfied with the quality of military medicine and the quality of care provided. Military physicians are also satisfied with their work hours, lighter workload, and less time spent on call. Military physicians are dissatisfied with their salary, quality of clerical support, and inability to help form policies (Blount et al., 1995; Kravitz et al., 1993; Mangelsdorff & Hubbart, 1976).

Nurse practitioners and physician assistants are moderately satisfied with their jobs (Bullough, 1974; Celentano, 1978; Elder & Bullough, 1990; Freeborn & Hooker, 1995; Koelbel et al., 1991a & 1991b; Reiss & Lawrence, 1976; Toffler, 1977; Tri, 1991; Vacek & Ashikaga, 1980). They are most satisfied when they are accepted by clients, help clients, and apply their provider skills. Both groups view their jobs as secure. Physician assistants measure job satisfaction in terms of seeing clients without supervision. Nurse practitioners measure job satisfaction in terms of workload and providing primary care services (Celentano, 1978). Nurse practitioners often function as nurses in general; their workload includes other activities in addition to patient care. Other factors associated with satisfaction for both groups are the variety and challenges in the content of work. Dissatisfaction for both groups arose from work environment issues such as low salary, time pressures, and lack of opportunity for career advancement (Baker et al., 1989; Freeborn & Hooker, 1995; Perry, 1984; Toffler, 1977; Tri, 1991). Physician assistants experience job dissatisfaction when attempting to meet clients' emotional needs, an attribute they share with physicians (Baker et al., 1989).

Major Limitations

The studies reviewed share limitations. The researchers in over half of the reported studies did not report validity and reliability data on their instruments (Bullough, 1974; Freeborn & Hooker, 1995; Holmes & Fasser, 1993; Makin et al., 1988; McCranie et al., 1982; Perry, 1984; Suchman et al., 1993; Tri, 1991). This limitation may be a space consideration related to publishing research in journals.

In seven out of 29 studies, researchers addressed limitations of their study (Breslau et al., 1978; Bullough, 1974; Elder & Bullough, 1990; Koelbel et al., 1991a & 1991b; Tri, 1991; Vacek & Ashikaga, 1980). When researchers fail to address limitations the reader must consider restrictions that may decrease the generalizability of the findings.

Another limitation involved various types of sampling bias. Twelve out of 29 studies had inexperienced providers as their sample (Baker & Cantor, 1993; Baker et al., 1989; Bullough, 1974; Celentano, 1978; Kravitz et al., 1993; Linn et al., 1985; Mainous et al., 1994; Makin et al., 1988; McCranie et al., 1982; Perry, 1984; Riess & Lawrence, 1976; Vacek & Ashikaga, 1980). An underlying question is whether experienced practitioners experience the same type of work satisfaction as inexperienced providers.

Another sampling bias encountered was selection of the sample from one setting. In over 50% of the studies reviewed, researchers used one study site (Baker & Cantor, 1993; Bullough, 1974; Freeborn & Hooker, 1995; Koelbel, 1991a & 1991b; McCranie et al., 1982; Schulz et al., 1992; Suchman et al., 1993). Similarly, over 75% of the studies used convenience samples without describing how they assessed bias. This practice decreases generalization of the findings (Blount et al., 1995; Breslau et al., 1978; Elder & Bullough, 1990; Freeborn & Hooker, 1995; Holmes & Fasser, 1993; Lewis et al., 1991; Makin et al., 1988; Schulz et al., 1992; Skolnik et al., 1993; Toffler, 1977).

## Results

### Characteristics of the Job Satisfaction Variable

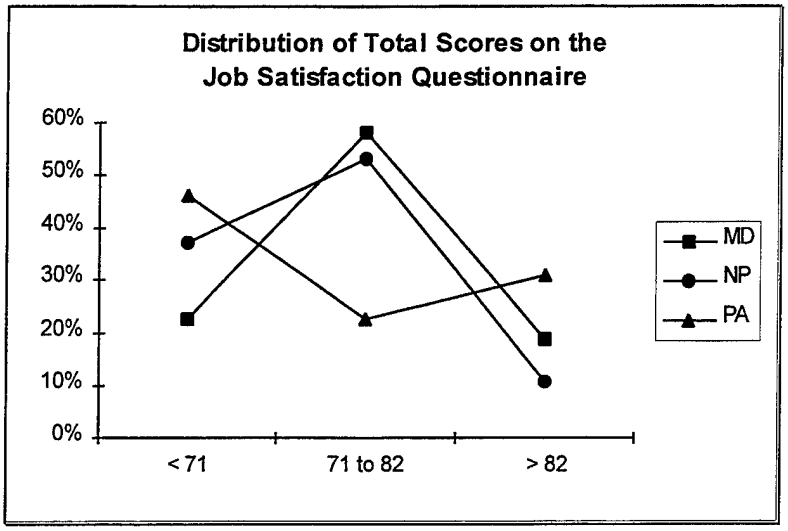
The objective of this portion of the data analysis was to describe the nature of the data collected on provider job satisfaction. For these analyses, providers were divided into three groups on the basis of their professional credential (physician, nurse practitioner, physician assistant). Descriptions of the basic demographic characteristics of the sample are provided in Chapter 1. Results of the analysis of the differences between provider types in experience and utilization are described in Chapter 2. Results of the analysis of the reliability and validity of the job satisfaction questionnaire are described in Chapter 9.

Frequency analysis of items on the job satisfaction questionnaire (see Appendix A) revealed that most providers were satisfied with the quality of the care they provide and the quality of their peers (i.e., 78% to 83% of providers rated items 1, 5, 6, and 20 as "satisfied most of the time" or "always satisfied"). However, there were eight items on which approximately 25% of the providers were dissatisfied (i.e., 24% to 28% of providers rated items 7, 8, 9, 10, 14, 16, 19, and 22 as "never satisfied" or "sometimes satisfied"). These items were concerned with direct patient care issues (such as time allotted per client), financial benefits, and ability to influence policy.

Total scores on the job satisfaction questionnaire ranged from 42 to 108. A score above 82 indicated a high degree of satisfaction with the financial, personal, and professional aspects of the job. A score of less than 71 indicated dissatisfaction with the ability to practice efficiently, to provide "continuity of care," and to have sufficient time for personal life. Figure 6-1 illustrates the

distribution of scores on the job satisfaction variable. Mean total scores on the job satisfaction questionnaire were 74.81, 71.05, and 74.00 for MDs, NPs, and PAs, respectively. A one-way analysis of variance was used to determine whether mean differences among the three groups of providers were statistically significant. Groups were not significantly different.

**Figure 5-1**




Intercorrelations of Practice Style Variables

The objective of this portion of the data analysis was to quantify the relationships among practice style variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 5-1 provides the intercorrelation matrix of these variables. It is clear from the data in Table 5-1 that there was a good deal of overlap among the practice style variables. As expected there was a strong positive correlation between job satisfaction and autonomy. The literature is replete with examples of the importance of autonomy in shaping job satisfaction. There was also a strong positive correlation between collaboration and job satisfaction. Nor was it surprising that job satisfaction and collaboration were strongly related, given the nature of the definition of collaboration used in this study (i.e., mutual respect and joint problem solving). Although the role of collaboration in influencing job satisfaction has not been well studied, the existing literature supports the hypothesis that collaboration is correlated with job satisfaction (see Chapter 4). For example, participants in experimental collaborative practices show an increase in satisfaction. Similarly, nurse practitioners and physician assistants are more satisfied when they practice in a climate of interdependence and teamwork.

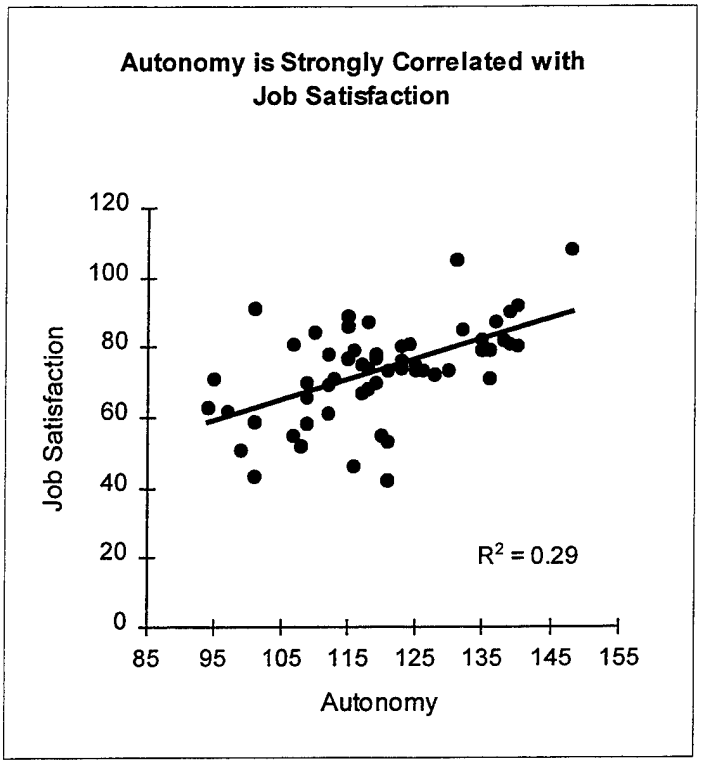
**Table 5-1**

**Intercorrelation Matrix of Practice Style Variables**

| N = 58 | Practice Model | Confidence | Autonomy | Collaboration | Information Giving | Job Satisfaction |
|---|---|---|---|---|---|---|
| Practice Model | 1.00 | | | | | |
| Confidence | 0.38 | 1.00 | | | | |
| Autonomy | 0.35 | 0.41 | 1.00 | | | |
| Collaboration | 0.32 | 0.25 | 0.56 | 1.00 | | |
| Information Giving | 0.41 | 0.36 | 0.52 | 0.43 | 1.00 | |
| Job Satisfaction | 0.28 | 0.23 | 0.54 | 0.45 | 0.30 | 1.00 |

Job satisfaction can be viewed as an outcome variable. In an effort to more fully assess the relationships among the provider practice style variables, a stepwise multiple linear regression of the variables practice model, confidence, information giving, collaboration, and was performed autonomy on job satisfaction. The analysis indicated that autonomy alone accounted for over 25% of the variance in job satisfaction, $R^2 = 0.29$; $F(1,57) = 22.76$, $p < 0.0001$ (see Figure 5-2). When the variable collaboration was added to the model, the $R^2$ value increased to 0.32; together these two variables accounted for almost a third of the variance in job satisfaction. No other variable alone or in combination with these two made a significant contribution to the model. Thus, the provider's levels of autonomy and collaboration were good predictors of the provider's level of job satisfaction.

**Figure 5-2**




The analyses presented in this chapter form the basis for an understanding of how job satisfaction was viewed by the provider sample. Chapters 6, 7, and 8 describe the results of analyses of the impact of provider practice style on client outcomes.

## Conclusions

(1) The average level of job satisfaction was not significantly different across the three types of providers.

(2) Providers were least satisfied with issues relating to direct patient care, continuity of care, the ability to influence policy, and financial benefits. They were most satisfied with the quality of care they were able to provide and with the quality of their peers, indicating that they were able to cope with problems with patient care and continuity of care. These results were virtually identical to a 1993 survey of military physicians.

(3) Congruent with the results of previous research, the level of autonomy predicted the level of job satisfaction.

(4) Interestingly, collaboration scores were positively correlated with job satisfaction scores. That is, those providers who reported high levels of collaboration, including mutual respect and

joint problem-solving, reported high levels of job satisfaction and those who reported low levels of collaboration reported low levels of job satisfaction.

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## CHAPTER 6

## CLIENT-PROVIDER COMMUNICATION DURING THE MEDICAL VISIT

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## Introduction

The objective of this chapter is to examine variables important to the client-provider interaction during the medical visit. The events that occur during the medical visit have important consequences for the client regarding the degree of involvement during the visit, adherence to treatment recommendations, and client outcomes. Client-provider interaction has not been extensively studied with nurse practitioner and physician assistant providers; most of the data is based on interactions with physicians. This project measured information giving behaviors of all three provider types and information seeking from the client perspective in an effort to determine if this form of communication influenced client health, functional, and satisfaction outcomes.

A critical aspect of the medical visit is the communication process between provider and client. The provider-client relationship is very complex because it requires cooperation between individuals in non-equal positions on issues of vital importance. The communication process between the provider and client serves three functions; it forms the foundation for: (a) mutual trust between the provider and client, (b) information exchange between the provider and client, and (c) whether or not the medical-decision making is a joint process between the provider and client. The establishment of trust is the first step in this relationship. Without trust there is no therapeutic endeavor and no working relationship. Once trust is established, information is exchanged by both parties. Both parties seek and give information in a therapeutic relationship. Medical decision making was done by the physician traditionally, but there is an increasing emphasis on clients' taking an active role in the process.

The communication process in the Army health care system differs from the civilian system in at least two ways. The first difference pertains to the Army's mission, which is to maintain the combat readiness of troops. Active duty personnel focus their energies on maintaining health, not illness. Conditions described by Daniels (1972 & 1973) have changed little in the ensuing 25 years. When a soldier is sick, the soldier must convince a squad leader or first sergeant that he/she is sick in order to gain access to the medical clinic. The first health care provider the soldier sees is typically the physician assistant in the unit. The physician assistant decides whether the soldier goes to sick call at a medical clinic, is treated at the aid station, or returns to duty. Once the soldier is at the medical clinic the individual must convince the provider he/she is sick. The provider must then decide if the soldier is fit for duty, should be placed on quarters, or admitted to the hospital. Because this chain of visits is time consuming and dynamic, the soldier may have difficulty getting his/her health problem addressed and may require several visits to the clinic obtain appropriate care. This process of seeking medical care is quite different from civilian community. In the civilian community, when an individual is sick, he/she goes directly to a health care facility.

The second difference is related to the traditional rank system. Inequalities in rank, whether the provider outranks the client or the converse, can preclude the client from openly participating in some aspects of provider-client relationship. Daniels (1973) found military clients were hesitant to initiate the interview or ask the provider questions. In civilian practice, the physician is an authority figure. Clients place physicians in high esteem and may even be intimidated by virtue of their higher education and socioeconomic statue, but the client is more comfortable in exchanging information. The physician rarely has the responsibility for rewarding or punishing the client in the workplace and can unequivocally assure confidentiality. Military providers must make decisions which dramatically influence career opportunities and can insure only limited confidentiality.

## Literature Review

### Information Exchange Concepts

The communication of information is regarded as the single most common form of interaction during a routine medical visit (Epstein, Campbell, Cohen-Cole, McWhinney, & Smilkstein, 1993; Roter, 1983). Information is a resource for both the provider and client. It is important for both parties to share information with each other.

The physician needs information from the client in order to establish the right diagnosis and treatment plan. The physician usually obtains this information during the history and physical examination component of the medical visit. The physician asks a series of direct questions aimed at eliciting specific information in order to formulate a diagnosis. This aspect of the medical visit can seem very one-sided and provider dominated. It is extremely important for the provider to use open-ended questions in order to obtain the client's perspective of the illness along with feelings and expectations associated with the illness (Hall, Roter, & Katz, 1988; Leopold, Cooper, & Clancy, 1996; Ong, DeHaes, Hoos, & Lammes, 1995). Once the physician listens to the client's input, this information is incorporated into the treatment plan.

Clients also have a desire for information and wish to be informed. There are three trends that emerge from the literature related to information that clients wish to obtain. Clients desire extensive, quality information presented in a respectful and understanding way. Generally speaking, clients want as much information as possible about their illness, results of tests, and information regarding a wide range of medical topics (Beisecker & Beisecker, 1990; Ende, Kazis, Ash, & Moskowitz, 1989; Leopold et al., 1996; Ong et al., 1995; Waitzkin, 1985). The more information the client has regarding health problems, the less uncertainty the client experiences (Mathews, 1983).

Quality information. Clients are interested in the quality of information given to them. Delbanco (1992) emphasizes that clients want to understand how the health problem impacts their life. In particular, clients want to know the effects that their health problems will have on their family, friends, finances, job, and future. Information is a very powerful resource because it can reduce uncertainty, and therefore be a coping strategy for the client. The more precise the information, the less uncertainty there is (Mathews, 1983). Clients want to trust their providers to tell them everything they need to know. Quality information is given when the provider tailors information to the client's needs. The following studies support the need for quality information.

Hopkins (1986) views information seeking behavior on a continuum. At the low end of the continuum is avoidance. Avoidance is the lowest level of information seeking; at this level the client does not really want information. At the center point of Hopkins' continuum is vigilance. The vigilant client will seek information to confront a threatening situation in order solve a problem and examine choices. At the upper end of the continuum is the hyper-vigilant state. The hyper-vigilant client is very compulsive about obtaining information and is hyper-alert to threatening situations.

Miller and Mangan (1983) studied the effects of information and coping styles of clients with cancer. The researchers randomly assigned 40 clients to a high or low information group on the basis of their scores on an information seeking instrument. The high information group received verbal and visual information about a procedure they were going to have, along with the possible meaning of the test. The low information group received minimal verbal information about the procedure and results. The findings from this study showed that the high information group experienced significant increases in anticipatory anxiety and depression which continued after the procedure. The high information group also experienced more discomfort during the procedure than the low information group. The researchers concluded that various coping styles interacted with, and determined the impact of information. This study supports the need to match coping styles with amount and type of information presented to the client. It is important to decide how much information should be presented to the client.

Hack, Degner, and Dyck (1994) examined relationships between cancer clients' preference for involvement in decision making and preference for information about the diagnosis, treatment, side effects, and prognosis. The sample included 17 women between the ages of 32 and 83 who had early stage cancer. A card sorting technique was used to examine clients' preferences for information. The results indicated that clients who desired an active role in choosing treatment wanted detailed information, while clients who did not want an active role preferred either a brief explanation or no information at all. Clients seeking an active role expressed a preference for a written copy of their diagnosis, while clients who did not want an active role wanted no copy at all. Involvement level was significantly related to the client's

educational level. Clients who graduated from high school preferred an active role during the medical visit while non-high school graduates preferred a passive role.

Information Giving. Traditionally physicians have been viewed as the primary and exclusive provider of information (Mathews, 1983). In the past, physicians have been able to control the amount and type of information presented to clients. When communication problems arise between the physician and client, they often stem from the fact that they do not share equal medical knowledge and language. Moreover, physicians and clients have different goals and interests. This inequality becomes detrimental when the client lacks the means to successfully negotiate his/her interest, e.g. when the provider explains the client's health problem to him/her in medical terminology.

McIntosh (1974) reviewed the literature pertaining to the process of communication with cancer clients. Results revealed that physicians were inclined to withhold information from clients because of the esoteric nature of the knowledge, the uncertainty of diagnosis/prognosis, and because the client would have the ability to assess procedures adequately.

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. Medical visits were audiotaped and averaged 16.5 minutes. Clients spent eight seconds asking the physicians questions. It was proposed that physicians may withhold information and maintain uncertainty to preserve power in the physician-client relationship, but the hypothesis was not supported in the study.

Information Presentation. The third trend emerging from the literature is the manner in which information is given to clients. Clients are very sensitive about contextual clues which inform them that their questions or input are not welcome. When providers give clients information in a respectful, sincere, and friendly way, clients are satisfied (Buller & Buller, 1987; Mathews, 1983). It is important for clients to feel understood and believed to be competent.

## Client Information Seeking Behavior

Client Variables. Lidz et al. (1983) used an observational design to examine what clients did with medical information. In interviews with 58 outpatients, these researchers found that clients wanted information for four basic reasons: to comply with treatment decisions,; to feel they had been treated with courtesy, not treated as an inanimate object, to exercise a veto over a decision the physician had already made, and to make decisions about their medical care. However, only 10% of the sample wanted information in order to make a treatment decision. The finding that so few clients used information to make medical decisions was consistently reported

in the literature (Beisecker, 1988; Beisecker & Beisecker, 1990; Ende et al., 1989; Siminoff & Fetting, 1991; Strull, Lo, & Charles, 1984; Sutherland, Llewellyn-Thomas, Lockwood, & Tritchler, 1989; Svarstad, 1974).

Another consistent finding from the communications research literature was that clients exhibit few attempts at obtaining desired information from the physician. Clients are reluctant to request information, seldom ask the physician to do anything, rarely make a statement to direct the physician's attention to something, and seldom demand detailed and fundamental information (Beisecker & Beisecker, 1990; Cassileth, Zupkis, Sutton-Smith, & March, 1980; Kaplan, Gandek, Greenfield, Rogers, & Ware, 1995; Lidz et al., 1983; Mathews, 1983; McIntosh, 1974; Pratt, Seligmann, & Reader, 1957; Roter, 1983; Waitzkin, 1985).

A variety of client and situational variables affect client information seeking behavior. Client variables included client attitudes, age, gender, level of education, and socioeconomic status. Situational variables of interest include type of illnesses, length of the interaction, first or repeated visit, length of the physician-client acquaintance, severity of illness, and clinical load.

Client Attitudes. The way the client perceives a provider and the provider role during the medical visit lay the foundation for client interaction during the visit. If the client believes that the provider is a technical expert and solely responsible for medical decision-making, then the client is usually passive during the medical visit. When the client obtains information, asks questions, appears motivated to learn about the health problem, and desires joint decision-making, the client is an active participant during the medical visit. Generally speaking, clients who are active participants during the medical visits have positive experiences (obtain more information, are satisfied with the medical visit, and achieve positive health outcomes) (Sutherland et al., 1989).

In a classic survey study by Pratt et al., (1957) clients had a very low level of participation with the physician during the medical visit. A post-visit interview found that clients exhibited an interest after the visit in receiving more information than they currently possessed. The sample consisted of 214 clients and 89 physicians. Clients seldom asked questions of the physician and did not ask for any fundamental information related to their health problem.

Sutherland et al. (1989) surveyed individuals with cancer (n = 52) and their desire for information and participation in treatment decisions. The findings indicated a positive association between the information seeking score and the level of preference for participating in decision-making. Most clients (77%) felt they had the opportunity to participate in decision-making to the extent they wanted, however, the remaining 23% agreed that they would have liked to have had more input. Sixty-three percent of the respondents believed the physician should take the primary role in medical decision-making, while 23% felt the decision-making process was a joint venture, and the remainder felt they had a major role in decision-making. Clearly this study supports the

idea that clients desire information in order to be actively involved during the medical visit but do not want to make treatment decisions.

Street, Cauthen, Buchwald, and Wiprud (1995) examined factors that influenced client willingness to discuss overall well-being, physical health, and psycho-social health with their physicians. A sample of 254 clients participated in this survey study. Clients were willing to discuss overall well-being, physical health, and psycho-social health with the physician if the physician asked about these issues. The clients believed it was the physician's job to ask.

Client Age. The literature shows mixed results related to client's age and information seeking behaviors. Some researchers found that older clients desired less information (Cassileth et al., 1980; Ende et al., 1989; Hall et al., 1988; Hooper, Comstock, Goodwin, & Goodwin, 1982; Hopkins, 1986; Kaplan et al., 1995; Lenz, 1984; Waitzkin, 1985). Older clients did not want to actively participate during the medical visit. This left decision-making up to the physician. Also, the client's age may affect the quality of information they received from the provider (Kaplan et al., 1995). Other researchers state that age is not a factor influencing information seeking behaviors (Buller & Buller, 1987; Dungal, 1978).

Cassileth et al., (1980) explored the degree to which clients with cancer (n = 256) preferred being informed and what participation they desired in their medical care. Younger clients were well-informed and were active participants during the medical visit while the older clients did not seek information and were passive during the medical visit. The researchers also found that clients who were active participants during the medical visit were significantly more hopeful than clients who were passive .

Hooper et al. (1982) examined client characteristics that influenced physician behavior during the medical visit. The sample consisted of 15 physicians, who were mostly residents, and 150 clients. The medical visit was observed through a one-way mirror. Interrater reliability was high between the two observers. Clients over the age of 74 required more of the physician's time. Also, physicians gave more information to older clients. The older clients, in general, also received more courtesy from the physician than other age groups.

Lenz (1984) reviewed the client search process related to obtaining medical information. Lenz found age negatively affected the information search process; older clients were less likely to search.

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. Medical visits were audiotaped and averaged 16.5 minutes. Older clients tended to receive more explanations. Some of this effect could be due to the clients' poor prognosis. Greater acquaintance between the client and physician was also an

alternative explanation. Physician age was not associated with time spent giving information to clients.

Hopkins' (1986) sample consisted of 58 clients with breast cancer. The aim of the survey study was to examine information seeking behaviors. Information seeking was negatively correlated with client age and severity of illness. The sample size was small and too homogenous to be extensively analyzed.

Ende et al. (1989) studied client information seeking behaviors and medical decision-making. The sample consisted of 312 clients who completed surveys (for a response rate of 39%). The results indicated that the client's desire for information did not always correlate with the desire to make medical decisions or client satisfaction with the medical visit. Older clients wanted to be informed, but did not want to make medical decisions. Younger clients also wanted information, but wanted to participate in medical decision-making with their physicians.

Kaplan et al. (1995) in the Medical Outcomes Study, examined characteristics of client visits and physician communication style. This study was conducted in solo practices, physician group practices, and HMOs. The sample consisted of clients (N = 8,316) and physicians (N = 344). The researchers found that older clients, 75 years and older, and clients younger than 35 years, were less participatory during the visit. With increasing age, clients were more likely to have longer on-going relationships with their physicians. When length of the visit and provider communication style were held constant, the effects of age persisted. During the medical visit, older clients exhibited fewer conversation behaviors than middle-aged clients. Also the older clients were less comfortable asking the physician questions and got less information from the physician. Physicians constrained the involvement of the older client because of age; client age seemed to modify the physician's communication style.

Beisecker (1988) examined the attitudes about information seeking behaviors of 106 clients undergoing rehabilitation. Results revealed that as age increased, there was a decreased tendency for the client to recommend an alternative treatment to the physician. Also the older clients placed decision-making in the hands of the physician. Clients in all age groups in this sample were passive when interacting with the physician.

Beisecker and Beisecker (1990) examined client information seeking behaviors during a medical visit. The sample consisted of 106 outpatients and seven physicians. The visits were audio-taped. The results indicated that older clients exhibited a greater number of verbal information seeking behaviors. This finding was attributed to the chronic illnesses that older clients experienced and the associated frustrations. When more time was given to the older client, they asked more questions.

Client Gender. Female clients exhibit more information seeking behaviors than male clients. In addition, female clients ask more questions, receive more of the physician's time, engage in more dialogue with the physician, receive more information from physicians, and have longer medical visits than male clients (Hooper et al., 1982; Lenz, 1984; Waitzkin, 1985; Wallen & Stoeckle, 1979).

Dungal (1978) studied physician responses to clients during the medical visit. This study used a survey design and was conducted in a university clinic setting. The researcher analyzed 559 medical visits. Results revealed that physicians had more negative feelings toward female clients. This finding may be associated with the residents' inexperience.

Wallen and Stoeckle (1979) studied 34 male physicians, 184 male clients, 130 female clients, and 333 medical visits. The first aim of this study was to compare male and female information seeking behaviors during the medical visit. A second aim was to contrast the physician responses to male and female requests for information. Both physicians and clients completed questionnaires and the medical visits were audio-taped. The results indicated that both physicians and clients showed greater participation in the information exchange process when the client was female. Female, rather than male, clients were significantly more likely to ask questions following a physician explanation more often. Female clients also asked questions that resulted in a physician explanation. When a physician interviewed female clients, the interview lasted longer than it did with male clients. The physician did not distinguish between male and female clients in the level of technical detail provided in their explanations.

Hooper et al. (1982) examined client variables of age, ethnicity, sex, and appearance in relation to physician behaviors of interviewing, nonverbal attention, courtesy, empathy, and information giving. There were 15 physicians and 150 clients in this observational study. Physicians gave more information to female clients and showed them more empathy. There were fewer physician-interrupted visits when the client was female.

Lenz (1984), in a literature review, found that females engaged in more extensive health search activities than males. Females also exhibited more information seeking behaviors such as asking questions and engaging in conversation with the physician.

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. Medical visits were audiotaped and averaged 16.5 minutes. Results revealed that female clients exhibited more information seeking behaviors than male clients. Female clients received more information, spent more time with the physician, and received more physician explanations.

Hall et al. (1988) found in their meta-analysis of physician-client interactions that female clients demonstrated more information seeking behaviors than male clients. These researchers

also found that female clients spent more time in communication than male clients. The physician engaged in more partnership building and more positive talk when the client was female.

Client Educational Level. Many studies have demonstrated that the client's education level influences individual information seeking behaviors and the amount of information given to the client by the physician. Some physicians believe it is the key to how much the client can understand during the medical visit (Mathews, 1983).

Mathews' (1983) literature review discussed the problems encountered during physician-client communication due to differences in medical knowledge and language. Clients often experienced difficulty negotiating their interests because they lacked understanding of technical information. Physician assessment of the client's ability to understand explanations was based on what the physician knows of the client's educational level and socioeconomic status. A client's capacity to process information, desire for information, and motivation to learn about their health problem was influenced by their educational level and socioeconomic status. The active participant who asks questions, interjects an opinion, engages the physician in a dialogue, and plays a role in medical decision-making is typically one who possesses more formal education(Deber, 1994a & 1994b).

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. Medical visits were audiotaped and averaged 16.5 minutes. When medical visits were analyzed it was revealed that a client's education level was a predictor of the physician's tendency to give information. Clients with some college received more information than those clients without college backgrounds.

Siminoff and Fetting (1991) studied the willingness of clients with breast cancer to participate in decision-making related to treatment options. The medical visits were audio-taped and analyzed. In addition, 100 women completed surveys and interviews. Sixteen physicians also participated in the study and completed a questionnaire. The physicians were university faculty members and oncology fellows. Eighty percent of the clients accepted the physician's treatment plan. Clients who had higher levels of education and had a specific understanding of the benefits of adjuvant therapy were less likely to accept the physician's primary treatment recommendations. Clients with less formal education tended to adhere unquestioningly to the physician's advice. Retrospectively, the researchers found that all clients wanted more information about treatment options, even when they did not ask questions.

Coulter, Peto, and Doll (1994) studied treatment preferences of clients consulting their general practitioner about menstrual disorders. The study sample included 425 clients and 129 physicians. Both groups completed the questionnaires. Clients who were more likely to express their views on treatment options were individuals with a higher educational level and had had

previous experience with consultation for menstrual problems. The women with higher educational levels also chose drugs, rather than surgery, for their menstrual problems.

In contrast, Cassileth et al. (1980) explored the degree to which clients with cancer (N = 256) preferred being informed and what participation they desired in their medical care. Education level did not effect desire for information or desire to participate in their medical care.

Hopkins' (1986) sample consisted of 58 clients with breast cancer. The aim of the survey study was to examine information seeking behaviors. Hopkins viewed the information seeking process as a way in which clients cope with a health problem. No significant relationship between client information seeking behavior and educational level was demonstrated. The clients had a mean educational level of 13 years, which might explain the lack of differences.

Client Socioeconomic Status. Another client variable that impacts the client's information-seeking behavior is socioeconomic status. With a sample consisting of 214 clients and 89 physicians, Pratt et al. (1957) found that physicians paid attention to a client's social status and made certain assumptions. The physician expected clients with higher social status to have the capacity to understand medical explanations, to want to know all the facts, and to be calm in the face of an unfavorable prognosis.

Lenz's (1984) review found that client socioeconomic status was negatively related to the extent to which they searched for information. Clients with lower socioeconomic status had less in common with physicians, more financial constraints, less formal education, and fewer social networks compared to clients with higher socioeconomic status. Clients with lower socioeconomic status relied on personal information sources and had less access to professional consultants.

Bain (1977) audio-taped 480 consultations to examine the relationship between physician-client communication and knowledge of the content of the consultation. In 91% of the consultations, clients were correct in their knowledge. There were notable differences between clients of upper and lower socioeconomic status. Clients with higher socioeconomic status articulated their health problems better than the clients with lower socioeconomic status. Another finding from this study revealed a significant difference in physician instructions given to clients of higher and lower socioeconomic status; they gave more instructions and explanations to clients with higher socioeconomic status.

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. Medical visits were audiotaped. Differences were reported as they related to information exchange and clients' socioeconomic status. Clients with a higher socioeconomic status received more physician explanation, information, and physician time than clients with lower socioeconomic status. Waitzkin proposed that there is a class sociolinguistic barrier that puts clients with a lower socioeconomic status at a disadvantage.

A study by Pendelton and Bochner (1990) examined the information process in general practice. The medical visit was video-taped for six physicians and 79 clients. Results of this study indicated social class was a significant predictor of how many explanations were volunteered by the physician. Clients with lower socioeconomic status received less physician explanations and information than clients with higher socioeconomic status.

A meta-analysis by Hall et al. (1988) revealed that client socioeconomic status differences related to information exchange during the medical visit. Clients of higher socioeconomic status received more information from physicians, as well as more overall communication. Clients with higher socioeconomic status received more positive talk and a higher quality of technical and interpersonal care. They attributed these differences to physicians making greater efforts to inform clients with higher socioeconomic status. The reason for this effort by physicians is the assumption that clients from higher socioeconomic status have more interest in, greater understanding of, and more questions about health problems.

Beisecker and Beisecker (1990) examined client information seeking behaviors during a medical visit. The sample consisted of 106 outpatients and seven physicians. The visits were audio-taped. Clients wanted information on a wide range of medical topics, but did not engage in effective information seeking behaviors. Clients believed the physicians to be responsible for making medical decisions. Clients' information seeking behaviors were more directly associated with situational variables, such as length of interaction, diagnosis, and reason for the medical visit. It is interesting to note that client attitudes influenced information seeking behaviors only for those clients who had a visit lasting at least nineteen minutes. A longer interaction period may be necessary for attitudes to emerge.

## Situational Variables

Type of Illness. Whether the client has an acute or chronic illness influences the physician-client interaction during a medical visit. An acute illness occurs when the client presents with a sudden onset of symptoms that has various levels of severity of symptoms. The illness resolves in a short period of time (sprained ankle, flu). A chronic illness is the presentation of symptoms that stay with the client over time which may get better or worse (diabetes, arthritis).

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. Physicians who saw chronically ill clients gave more information than physicians seeing acutely ill clients. A client's prognosis was also a predictor of information transmitted. Clients with an unfavorable prognosis, not necessarily a fatal illness, received more of the physician's time, more explanations, and more information.

Lidz et al. (1983) used an observational design to examine what clients did with medical information. They examined the information processes and behaviors between the physician and client during the medical visit. This study analyzed 58 outpatient visits. These researchers found that clients with chronic health problems actively participated in the medical visit and decision-making process, while clients with acute illnesses did not. The acutely ill clients took on behaviors and attitudes associated with the "sick" role and let the physician take the responsibility for medical decision-making.

In contrast, Ende et al., (1989) studied client information seeking behaviors and medical decision-making. The sample consisted of 312 clients who completed surveys (for a response rate of 39%). They found that clients with better health status had a stronger desire for information and a stronger preference for decision-making. Also, clients wanted more decision-making power during a minor illness, while clients with major illness preferred that the physician make the decisions.

Hall, Roter, Milburn, and Daltroy (1996) examined client health status and physician and client behavior during the medical visit. This group of researchers analyzed four of their previous studies using meta-analysis techniques. All studies had adequate sample sizes with over 250 physicians and 1,300 clients. Clients in poor physical and psychological health received less social conversation from the physician. Clients who were sicker and more distressed engaged in less conversation than healthier clients. The client's self-rating of mental health significantly related to the physician's global anger. Physicians disagreed more with the sicker and depressed clients and less with healthier clients. The clients' health status also influenced physician satisfaction; physicians were less satisfied following visits with less healthy clients.

Length of Medical Visit. Beisecker and Beisecker (1990) examined client information seeking behaviors during a medical visit. The sample consisted of 106 outpatients and seven physicians. The visits were audio-taped. They discovered that the length of the medical visit was a significant factor in determining client information seeking behaviors. A longer interaction, lasting at least nineteen minutes, was necessary for clients to demonstrate information seeking behavior.

Kaplan et al. (1995) in the Medical Outcomes Study, examined characteristics of client visits and physician communication style. This study was conducted in solo practices, physician group practices, and HMOs. The sample consisted of clients ($N$ = 8,316) and physicians ($N$ = 344). They found that the physician's participatory decision-making style increased as the duration of the medical visit increased. Medical visits lasting less than five minutes had the least interaction between the physician and client, while visits lasting at least twenty minutes had the most interaction between the physician and client.

First Time Visits vs Repeat Visits. Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. There was a strong positive correlation between the length of time the client had known the physician and the amount of information exchanged during the medical visit. The client also participated more actively during the medical visit.

Buller and Buller (1987) examined physician communication style. The researchers did telephone interviews with 219 clients from two clinics. They found that the number of previous visits influenced the client's perception of the physician's communication style. The less the client saw the physician, the more important the physician's communication style was to the client. The client also participated more during the visit when there was an established relationship with the physician.

Kaplan et al., (1995) in the Medical Outcomes Study, examined characteristics of client visits and physician communication style. This study was conducted in solo practices, physician group practices, and HMOs. The sample consisted of clients (N = 8,316) and physicians (N = 344). They discovered that clients visiting the physician for the first time participated less than clients seeing the physician more than once. Participation during the medical visit was the greatest for clients with repeat visits. Clients who had known their physician for at least five years participated the most during the medical visit.

Busy Clinical Load. Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. It was discovered that when physicians saw more than 20 outpatients a day, less time was spent giving information and fewer explanations were given to the client. Physicians concentrated on seeing all of their clinical load, instead of giving the client time to ask questions or express their concerns. The dialogue between the physician and client was short when the physician was rushed.

Provider Information Giving Behavior

When a client seeks consultation from a physician, the client is expected to give the physician information and vice versa. Client information assists the physician in formulating a diagnosis. Roter and Hall's (1993) review found that 50% of the time in a medical visit was spent in the client giving information to the physician. Clients also like to have the physician give them information related to their health problem. The physician initiates dialogue 60% of the time during the medical visit and question-asking accounts for 23% of the interaction. A major difficulty with this information exchange is that the client may not give the physician the information that is needed and the physician may have difficulty in communicating with the client in a language and style that is appropriate to the client's needs.

Historically, research has shown that physicians have difficulty perceiving the client's desires for information. Many researchers agree that physicians often under-estimate the client desire for information and over-estimate the time spent engaged in giving information (Pratt et al., 1957; Roter, 1983; Roter & Hall, 1993; Waitzkin, 1985). Pratt et al. (1957) conducted post-visit interviews with 214 clients and 89 physicians. They found that 81% of physicians underestimated the desire for information and the client's knowledge of their health problem.

Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. The researcher found that physicians typically spent 1.3 minutes giving information to the client in a 16 minute medical visit. Physicians under-estimated the client's desire for information and over-estimated the time they engaged in information giving activities.

Roter (1983) and Roter and Hall (1993) found that 19% to 35% of the physician's time in primary care was directed at health education and counseling. They also found physicians under-estimated the client's interest in receiving information.

Coulter et al. (1994) studied treatment preferences of clients consulting their general practitioner about menstrual disorders. The study sample included 425 clients and 129 physicians. Results revealed that 35% of their sample had strong treatment preferences. Even though the clients discussed their preferences with their physician, the physician was unaware of their client's wishes.

Strull et al. (1984) examined client participation in medical decision-making related to hypertension. The sample consisted of 210 clients and 50 providers (41 MDs and nine NPs). Forty-one percent of the clients wanted more information about hypertension. Physicians under-estimated client preferences to discuss therapy in 30% of the clients. The physician also over-estimated client preferences in 11% of the medical visits. Many clients (53%) wanted to participate in decision-making, but the physician thought that 78% of the clients wanted to participate.

Buller and Buller (1987) examined physician communication style. The researchers did telephone interviews with 219 clients from two clinics. Client age did not influence the physician communication style. The physicians exhibited a consistent affiliative or dominant style of interaction, regardless of age.

Client Characteristics. The physician's information giving behaviors are based on certain assumptions about client and physician characteristics. Client characteristics include tendency to ask questions during the medical visit, exhibiting concern about health problems, coping ability, motivation, ability to learn, and social class.

Street and Wiemann (1987) found that the amount of information given by a physician was influenced by the client's ability to ask questions, to express concern about health problems, and to display anxiety. When clients exhibited these behaviors the physician would give more information.

McIntosh (1974) found in a review of the literature that physicians assumed clients were incapable of comprehending medical information about cancer. In addition, physicians believed clients would have trouble coping emotionally if information about cancer treatment was given to them.

Dungal (1978) explored physician responses to clients during the medical interview. This study used a survey design and was conducted in a university setting. The researcher analyzed 559 medical visits. Physicians had negative feelings regarding female clients and clients with lower socioeconomic status. The physicians were residents and their frustration level and anxiety diminished as they progressed in training. Why residents experienced selective frustration and anxiety early in training was not explained.

Mathews' (1983) literature review of physician-client interaction studies revealed that physician assessment of the client's ability to understand explanations was related to the way the client impressed the physician. Clients were categorized by physicians according to their capacity to understand, desire for information, and apparent motivation to learn about their health problems. The categorization was highly correlated with the client's educational level and socioeconomic status.

Provider Characteristics. This literature addresses certain characteristics that influenced the physician's information giving behavior. These characteristics included age, gender, socioeconomic status, attitudes about giving information, confidence level, and style of communication.

Age. Buller and Buller (1987) examined physician communication style. The researchers did telephone interviews with 219 clients from two clinics. They found that physician age was important in physicians' communication style when clients evaluated care, but only for the affiliative style of communication. Younger physicians who were more affiliative produced favorable evaluation from clients. Older physicians produced favorable evaluations regardless of their style of communication.

Gender. Physician gender is a second characteristic that influences the physician-client interaction. Hall, Irish, Roter, Ehrlich and Miller (1994a & 1994b) examined gender differences related to verbal and nonverbal communication between the client and physician during the

medical visit. The researchers analyzed 100 medical visits completed by 25 male and 25 female physicians. There was no difference between female and male physicians in the total amount of information given to the client. This information included medical information, social conversation, technical language, and emotional support. Gender differences related to the manner in which information was given to the client. Medical visits to female physicians were longer and more talkative for both client and physician. Female physicians also engaged in more positive talk, used more partnership language, asked more medical and psycho-social questions, and gave more smiles and nods. The female physicians also received more information from clients than their male colleagues.

Socioeconomic Status. Waitzkin (1985) investigated medical encounters in a stratified sample of 34 physicians and 314 clients from three outpatient settings. This study highlighted the importance of physician socioeconomic factors when giving information to clients. This researcher found that physician income was negatively related to physician information giving. Physicians who earned less money tended to spend more time giving information and explanations to clients than their colleagues that earned more money. There was a positive relationship between the physician's socioeconomic background and information giving behaviors. Physicians who came from corporate or middle class backgrounds gave more information and explanations to their clients than those who came from other types of backgrounds. There was also a weak trend for physicians who had favorable attitudes about information giving to give more information than physicians who had less favorable attitudes regarding information giving.

Confidence Level. Another characteristic that influences physician information giving is their confidence level. This variable has not been studied as extensively as other variables, but there is evidence that this variable has an influence (Bush, Cherkin, & Barlow, 1993; Dungal, 1978; Hall et al., 1988).

Dungal (1978) studied physician responses to clients during the medical visit. This study used a survey design and was conducted in a university clinic setting. The researcher analyzed 559 medical visits. Physicians in the study were all residents. They experienced high anxiety, discomfort with the medical visit, and frustration with female clients, lower socioeconomic status clients, new client problems, clients with psycho-social problems, and clients with continuous health problems that did not resolve. As the residents progressed in their program, their anxiety, discomfort, and frustration decreased.

A meta-analysis by Hall et al. (1988) of provider behavior in medical encounters revealed that physicians exhibiting confidence with their interpersonal skills had more satisfied clients.

Clients also reported more recall and understanding of their health problem when the physician had a high interpersonal skill confidence level.

Bush et al. (1993) examined client satisfaction with provider information giving, provider caring, and effectiveness of treatment. This study was conducted in a large primary care HMO. Surveys were administered to 21 providers (18 physicians and three physician assistants) and 270 clients. Both providers and clients were chosen from a purposive sample. The clients all had low back pain. Provider confidence level was positively related to clients satisfaction with the information given to them. The providers who exhibited the most confidence in giving information and managing low back pain had satisfied clients. However, attitude regarding back pain was not related to client satisfaction.

Communication Style. Information giving behavior lies along a continuum. At one end of the continuum is an affiliation style. This style consists of communication behaviors that are collaborative with the client and maintain a positive relationship with the client (Ben-Sira, 1976; DiMatteo, Prince, and Taranta, 1979; Friedman, DiMatteo & Hays, 1980; Street & Wiemann, 1987). This style is associated with client participation during the visit and joint information-exchange. At the other end of the continuum lies a control/domination style. This style consists of behaviors that establish and maintain provider control of the interaction. It is characterized by a display of power, authority, and professional detachment ( Hall et al., 1988; Street & Wiemann, 1987). This style of communication is associated with one-way communication from the provider to the client, with limited exchange of information.

Research provides evidence that an affiliative style of communication is linked to higher degrees of client participation, less domination by the provider, client satisfaction with the medical visit, and favorable client outcomes. A meta-analysis (Hall et al., 1988) suggested that there is a positive association between partnership building and client satisfaction, physician information giving, and improved client recall and understanding.

Buller and Buller (1987) examined physician communication style. The researchers did telephone interviews with 219 clients from two clinics. They found that when physician communication was more satisfying, the client perceived the medical visit as a satisfying experience. Physicians who demonstrated an affiliative style of communication produced more favorable client evaluations, whereas physicians who had a dominant style of communication produced less favorable client evaluations. Nearly 75% of the variance in the evaluation of medical care was associated with evaluating physician communication skills. The physician's communication style was more important when the client was less ill and less important when the client was severely ill.

Frederikson (1995) explored information exchange during medical visits. A convenience sample of 35 physicians and 35 clients completed surveys. The aim of the study was to evaluate the importance of information exchange with the client. The majority of clients believed that exchanging information with the physician was essential. This belief led clients to actively participate during the medical visit. Clients were most satisfied when the physician addressed their concerns, explored their expectations, discussed their ideas, and discussed the effects of their health problems. The clients also rated the quality of information as more important than the quantity of information. These findings suggest that the physician's task is to tailor information to a specific client's need. This study also suggested that information related activities were important to client outcomes, such as client understanding, attitude toward proposed treatment, perceptions of physician response, and developing a good therapeutic relationship with the physician. These outcomes were significantly related to client satisfaction with the medical visit.

The majority of research studies regarding communication styles during the medical visit target the physician. Only a few studies examined the communication styles of physicians with nurse practitioners and physician assistants (Foye, Chamberlin, & Charney, 1977; Hall et al., 1988; Oliver, Conboy, Donahue, Daniels, & McKelvey, 1986; Wasserman, Inui, & Barriatna, 1983). Oliver et al., (1986) compared satisfaction with physician assistant services and found that clients were most satisfied with physician assistants' interpersonal skills, especially politeness and courtesy. Three studies (Foye et al., 1977; Hall et al., 1988; Wasserman et al., 1983) found that nurse practitioners gave more information to clients, asked more open-ended questions to elicit client input, used more positive talk, and provided more overall communication than physicians. The important message derived from the literature is that the provider-client interaction during a medical visit impacts client outcomes, particularly client satisfaction and client health/functional status.

Client Satisfaction

Wagener and Carter (1978) evaluated client satisfaction ($N$ = 3,527) with gynecological services at a university clinic run by one nurse practitioner. The majority of clients were very satisfied with the nurse practitioner's performance, especially the caring attitude and the opportunity to discuss concerns thoroughly. Clients also expressed satisfaction with the way in which the nurse practitioner performed the physical examination.

Stiles, Putnam, James, and Wolf (1979) examined client and physician roles during the history, physical examination, and conclusion of the medical visit. The sample was composed of 19 physicians and 52 clients from one medical clinic. All interactions during the visit were audio-taped and clients completed a post-visit satisfaction survey. The variables examined were attentiveness, acquiescence, presumptuousness, and client satisfaction with the medical visit.

Physicians were very attentive during the history taking and a mutual exchange of information occurred during the conclusion of the visit. Physicians were more controlling than clients throughout the medical visit, especially during the physical examination. The physician was moderately presumptuous during the history taking and the conclusion of the visit. Clients had low, unwarranted, boldness throughout the medical visit. Clients were satisfied with the medical visit when they expressed themselves freely in the early part of the medical interview. Clients were most satisfied when the physicians provided information and shared control during the conclusion of the visit. These findings support the concept that clients place value on the opportunity to participate in the medical visit and have a need to get information from the physician.

DiMatteo and Hays (1980) investigated client's perception of the interpersonal components of the medical visit. The sample consisted of 329 clients and 48 physicians from a university affiliated primary care clinic. Clients completed a satisfaction survey after the medical visit. Female clients tended to be slightly, but not significantly, more satisfied with their physician than male clients. Older clients were more satisfied with their visit than younger clients. Clients who had been under the care of the same physician for a long period of time were more satisfied with the visit than they who had a shorter period of acquaintance with the physician. Clients with higher socioeconomic status depended more on their perceptions of the technical quality of physician care than clients with lower socioeconomic status. Similarly, the technical performance of the physician was more important to the general satisfaction of older clients than younger clients. When the client believed that the physician was an effective communicator, the physician was viewed as technically competent and providing appropriate, effective, care. This finding supports the conclusion that clients rate their physician's technical skills on the basis of their ability to communicate with the client.

Smith, Polis, and Hadac (1981) examined the relationship between physician verbal behaviors and level of client satisfaction and understanding. The study was conducted at a university clinic with 11 physicians (seven were residents). There were 29 clients who were making their initial visit to the clinic. The physician-client interaction during the medical visit was video-taped and clients completed a post-visit survey. The majority of clients were women, ranging in age from 18 to 72 years. There were several interesting findings in this study. Client understanding was significantly associated with the amount of time spent by the physician in providing information. An increase in physician information giving was related to client satisfaction with the medical visit. The longer the visit, the more the client was satisfied. Also, clients were satisfied when time was spent on preventive topics. Finally, client understanding was inversely related to the physician's physical distance in the room. Clients had difficulty understanding the instructions of the physician when the physician and client were widely separated in the room.

Wartman, Morlock, Maitz, and Palm (1983) examined client understanding and satisfaction with the communication process during the medical visit. The sample consisted of 879 clients enrolled in a pre-paid medical plan. They were mostly female and middle-aged, with a variety of primary care health problems. Client compliance was positively correlated with understanding of drug instructions, but not correlated with satisfaction with the communication during the visit. Clients who were satisfied with the visit did not report more compliance. The researchers concluded that satisfactory communication, as reported by the client, does not necessarily reflect effective communication about drug regimens. The telephone interview occurred one week after the medical visit, so intervening experiences could affect the responses given by client.

Putnam, Stiles, Jacob, and James (1985) studied the association between verbal behavior during the medical visit and outcomes of care. This convenience sample consisted of 14 physicians and 102 clients from one outpatient clinic. The medical visit was audio-taped and clients completed a telephone interview at one and four weeks post-visit. The results of this study showed that client sharing and physician explanation were positively correlated with client satisfaction, client age, education, belief in the controllability of their illness, and confidence in physician/medical science. All of these factors had a small, but significant, independent effect on client satisfaction with the medical visit.

Oliver et al. (1986) explored client satisfaction with physician assistant services in rural clinics. There were 308 clients and 11 physician assistants in the study. Results indicated that clients were most satisfied with the physician assistant's interpersonal skills. Overall, female clients rated physician assistants higher than male clients. Physician assistants were also rated high on the client's comfort level when procedures were done. The more educated the client, the higher the client's comfort level. Comfort level was also positively related to the degree of previous exposure to the physician assistants.

Buller and Buller (1987) examined physician communication style. The researchers did telephone interviews with 219 clients from two clinics. Results suggested that client evaluation of medical care is strongly associated with client evaluation of the physician's ability to communicate with them. This finding implied that competence associated with the physician's ability to communicate with the client was a key factor in the rating of physicians' overall medical competence. An affiliative style of physician communication was positively related to client satisfaction with the medical visit. The dominant style of physician communication was negatively associated with client satisfaction with the medical visit.

Like and Zyzanski (1987) studied client desires, fulfillment of desires, and satisfaction with the medical visit. This study surveyed a convenience sample of 144 clients and 23 physicians from a university clinic. Clients requested, on average, 12.3 services during the medical visit and

received 11.6 services. Client requests pertained to the need for information, psycho-social support, and to express opinion during the visit. Study results indicated that clients who had their requests met were more satisfied with the visit than those with unmet requests. A meta-analysis by Hall et al. (1988) summarized the relationships between provider behaviors during the medical visit and client outcomes. Clients were more satisfied when the physician provided information. The greater the physician's interpersonal competence, the more the clients were satisfied with the visit. A positive correlation occurred between partnership building and client satisfaction with the visit. Finally a weak association existed between client satisfaction with the medical visit and appointment keeping. Client satisfaction with the medical visit was best predicted by the amount of information given by the physician and an affiliative style of communication. These researchers concluded that physician information giving behavior carried socio-emotional significance for clients and did so through the manner in which the information is conveyed and interpreted.

Brody, Miller, Lerman, Smith, and Caputo (1989) studied the relationship between client satisfaction with the physician, the types of interventions received, and the congruence between interventions that clients received and those they desired. The sample was composed of 118 clients. Clients who received education, received stress counseling, or were allowed to express their ideas were significantly more satisfied than those who did not receive these interventions. There was no difference between the congruence rate for non-technical interventions and technical interventions. Client satisfaction with the medical visit was directly related to the physician's efforts to deal with client needs such as education, stress reduction, or talking.

Campbell, Mauksch, Neikirk, and Hosokawa (1990) examined the communication style of physicians and nurse practitioners in the delivery of primary care. Observational data was collected from 60 ambulatory clinic sites across the United States. A sample of 412 provider-client visits were videotaped, including 276 physicians and 136 nurse practitioners. The providers were blinded to the specific types of behaviors to be examined or the coding system employed. Both provider groups had six to nine years of experience in the provider role. Most of the client visits were for acute problems followed by chronic problems, well-care, and follow-up visits. There was little difference between the nurse practitioner and physician styles of interaction. Both provider groups concentrated on somatic diagnosis and treatment in initial visits with clients. If clients were seen several times by the same provider, the communication style changed to include a discussion of psycho-social issues. Nurse practitioners did exhibited significantly more concern with psycho-social issues than physicians. More specific comparisons of nurse practitioners and physicians were limited by the small number of female physicians and male nurse practitioners. Even though these providers had a range of six to nine years experience, both provider groups were still considered young. The nurse practitioners graduated from one

specific education program and the clinics represented family practice rather than the traditional general practice.

Bertakis, Roter, and Putnam (1991) investigated the relationship between physician communication style during the medical visit and client satisfaction. The sample included 98 residents and staff physicians. Chronically ill clients (n = 550) also participated. The study was conducted in 11 outpatient clinics across Canada and the United States. The medical visits were audio-taped and clients completed questionnaires immediately after the visit. Results of this multiple site study revealed several findings. Physicians typically asked questions, both closed and open-ended, related to biomedical topics. The number of these questions was negatively correlated to client satisfaction with the medical visit. However, the number of questions physicians asked about psycho-social topics was positively correlated with client respondent satisfaction with the visit; physician counseling for pyscho-social concerns was positively linked to client satisfaction. Physicians' dominance of the interview (by talking too much) was negatively linked to client satisfaction. The physician's friendliness and interest in the client were positively related to client satisfaction. There was greater client satisfaction with the visit when the physician was an egalitarian, held a psycho-social orientation, and facilitated client talk. This study also supported previous findings that older clients are more satisfied with the medical visit than younger clients. Also, clients who were Caucasian were more satisfied with their medical visit than non-Caucasian clients.

Mainous, Bertolino, and Harrell (1992) conducted a telephone survey of all households in Kentucky to determine the proportion of adults who received health care from physician assistants and/or nurse practitioners. The sample was derived by random digit dialing and 687 clients completed the survey. Twenty-five percent of the clients had received care from either a physician assistant or nurse practitioner primarily for minor health problems or routine physical examinations. Over 90% of the clients were satisfied with the care they received from these two types of providers. Users of physician assistants and nurse practitioners were young, male, and less likely to go to a traditional health care setting (like a doctors office, hospital emergency room, or health clinic).

Robbins et al. (1993) explored the relationship between physician behaviors and client satisfaction with the medical visit. New clients (n = 100) were randomly assigned to receive care from 54 residents at a university based clinic. The medical visit was video-taped and analyzed. Clients completed pre- and post-visit surveys. Client satisfaction with the medical visit was positively related to the time spent during the visit on health education, the physical examination, discussion of treatment effects, and pre-visit satisfaction with medical care in general, but negatively related to history taking. Medical history taking was considered a discussion of biomedical topics. Time devoted to health education, the physical examination, and discussion of

treatment effects involved an interaction that was more personal to the client. The researchers controlled for selection bias by randomly assigning clients to providers.

Joos, Hickman, and Borders (1993) examined client desires and satisfaction with the medical visit. This study was conducted in a university-affiliated Veterans Affairs medical clinic. The sample consisted of 243 male clients with chronic health problems and 43 residents and staff physicians. Clients desired an average of 11.9 services and the average desires met were 7.5. Clients desired information about health problems and medications which were often not met. The younger client was more likely to need psycho-social assistance. The findings indicated that clients who reported excellent health, were more satisfied with their medical care than those with good, fair, or poor health. Client satisfaction with care was significantly and positively correlated with the percent of desires met and negatively correlated with the number of desires not met. Client satisfaction with care was strongly related to the physician's ability to meet the desire for information and affective support, not whether the physician met the desire for examinations, diagnostic tests, or medication.

Greene, Adelman, Friedmann, and Charon (1994) examined older clients' satisfaction with communication during the medical visit. The sample consisted of 81 clients coming to the clinic for new appointments and 18 physicians in a group practice. Physicians questioned clients on client-raised topics and exhibited a supportive attitude. These topics were significantly correlated with client satisfaction with the medical visit. Client information giving on mutually-raised topics was positively and significantly correlated with client satisfaction with the medical visit. Other factors relating to client satisfaction included length of the medical visit, physician use of direct questions, shared laughter between client and physician, and physician satisfaction with the job. This study, as did other studies, demonstrated that clients are sensitive to, and value, the physician's interpersonal style of communication during the medical visit (Joos et al., 1993; Robbins et al., 1993; Williams, Weinman, Dale, and Newman, 1995).

An international study by Williams et al. (1995) sampled 504 clients with a variety of primary health problems. The majority of these clients were middle-aged women (mean 41 years old). Clients in this study expected the physician to clearly explain health problem, understand the client's needs, and permit clients to express themselves during the medical visit. Clients with a greater number of their expectations met. Joos et al. (1993) found very similar results.

Frederikson (1995) explored the information exchange process during the medical visit. A convenience sample of 35 physicians and 35 clients participated in this survey study. Physician performance was very high on all information tasks. The strongest relationships occurred between client satisfaction with the medical visit and addressing client concerns, exploring client expectations, exploring client ideas, and discussing the effects from health problems. Most clients (57%) recorded a reduction in concerns following the visit. Clients wanted the information

exchange process to be an active process and suggested that physicians should present quality information tailored to meet specific client needs.

Health Outcomes

An investigation of the physician-client relationship during the medical visit and its effects on client outcomes was done by Greenfield, Kaplan, and Ware (1985). These researchers developed an intervention that increased client involvement during the medical visit. The intervention consisted of coaching clients to ask questions, read their medical chart, and negotiate medical decisions with the physician. The study was conducted at a Veterans Administration outpatient clinic that treated clients with gastric ulcer disease. At baseline, all client-physician visits were audio-taped and clients completed surveys related to health status, preference for active involvement in medical decision-making, knowledge of ulcer disease, and satisfaction with the medical visit. When clients returned for their next appointment they were randomly assigned to either a treatment group with 23 clients or a control group with 22 clients. Six to eight weeks after the intervention, medical visits were audio-taped again and clients completed the surveys. Results showed that clients in the treatment group were significantly more involved in the medical visit and more assertive in directing the flow of communication than those in the control group. Furthermore, the treatment group reported significantly fewer physical and role limitations than the control group.

Orth, Stiles, Scherwitz, Hennrikus, and Vallbona (1987) examined client sharing and provider explanation during the medical visit. This correlational study had 217 clients, nine physicians, and two physician assistants. The medical visits were audio-taped and analyzed. Clients had chronic blood pressure problems. Client sharing was significantly correlated with reductions in systolic and diastolic blood pressure during the home visit. Provider explanations were significantly associated with lower diastolic blood pressure at the home visit, but not with clinic blood pressure, or with change from clinic visit to home visit.

Brody et al. (1989) investigated the relationships among three variables: clients' perceptions about the medical visit, their attitudes about their illness, and self-rated improvement in health status. The sample consisted of 117 clients and eight physicians from a university clinic. Clients completed surveys before, one day after, and one week after the medical visit. The physicians completed a survey shortly after the medical visit. Results revealed that 47% of the clients felt that they played an active role during the visit and active participants reported less discomfort, greater symptom relief, and an improved general medical condition one week after the medical visit. Active participants also reported less concern with their illness, more control of their illness, and more satisfaction with the physician one day after the medical visit.

Kaplan, Greenfield, and Ware (1989) investigated the physician-client interaction and the outcomes of chronic disease. These researchers conducted four randomized trials among 45 clients with ulcer disease, 105 with hypertension, 59 with diabetes, and 43 with breast cancer. These studies utilized several clinic sites. The medical visits were audio-taped and clients completed surveys. Good health was consistently related to the client's conversational behavior during the visit. Clients who interacted more by asking questions and attempted to direct the flow of conversation had fewer missed days from work, health problems, functional limitations, and more favorable ratings of their health at follow-up than the less active group. The physician's conversational behavior during the medical visit was also related to health status at follow-up, but less than the client's conversational behavior. When the physician dominated the interaction by asking questions, giving directions, or interrupting the client, poorer health status was reported at follow-up. Poorer control of diabetes and hypertension at follow-up was associated with less client control, less effective information seeking behavior, and less involvement by the client and physician during the visit.

Carlberg and Tibblin (1992) compared two approaches to treating hypertension and compared client experiences and degrees of satisfaction with medical care. One approach was non-pharmacological and, the other, pharmacological. The treatment group had 165 clients who received a non-pharmacological approach that consisted of regular visits with the same physician, monthly checkups by a nurse, and information programs with group activities. The pharmacological group of 85 clients who received a traditional medical visit along with anti-hypertensive drugs. In this longitudinal study, clients completed surveys. There was no initial difference between groups on measures of demographic information and diastolic blood pressure. However, some respondents in the non-pharmacological group were also using anti-hypertensive agents. Clients in the non-pharmacological group were more satisfied with treatment as a whole, their latest visit, and the information they received. The non-pharmacological group also had more positive attitudes toward hypertension and medical care. They experienced self-perceived improvement in health status over the two years. In addition, the non-pharmacological group were able to discontinue their anti-hypertensive drugs completely.

Bertakis, Callahan, Helms, Azari, and Robbins (1993) studied 150 client-physician interactions to examine the effects of physician practice style and client health status. Each client-physician interaction was videotaped and analyzed. Clients also completed surveys. Clients in better health interacted more with the physician during the visit. Physicians took a more extensive history from clients with poorer health. Clients experiencing interpersonal problems were counseled more by the physician than other clients. Clients who were in poorer health and had higher education and income spent more time during the visit discussing their ongoing treatment plans than clients in better health.

Hall, Milburn, and Epstein (1993) studied client health status and satisfaction with medical care. Older clients (n = 526) were surveyed at the start of the study and one year later. The clients were assigned to one of three treatments: consultations from an interdisciplinary team, consultations from an internist, and the standard HMO services. The researchers measured functional ability, self-perceived health, and satisfaction with the medical visit. Using structural equation modeling, the direction of the causal link went from the client's self-perceived overall health/functional ability to satisfaction over time. These researchers found no evidence that satisfaction with medical care led to changes in health status.

Stewart (1995) conducted a meta-analysis of physician-client communication and health outcome. Twenty-one studies were reviewed. The majority of the studies reported physician-client communication during the medical visit significantly influenced client health outcomes. The health outcomes most affected were emotional health, symptom resolution, functional status, blood pressure, blood sugar level, and pain control.

Zapka et al. (1995) explored the relationship between client satisfaction with the medical visit and health status in a survey study. A sequential data collection process was used to collect a sample of 3,151 clients. Approximately half of the clients experienced a chronic illness. The results indicated that clients who had a chronic condition were more likely to be satisfied with the medical visit, while younger clients were less likely to be satisfied. Minority clients who had higher levels of education were less satisfied with the visit. Clients who report receiving confusing information from the physician were less satisfied with the medical visit.

Major Findings

Anderson and Helm (1979) stressed that client expectations for, and knowledge of, the healthcare system influenced the course of the medical encounter. Several client demographic variables such as age, attitude, gender, educational level, and socioeconomic status are related to the medical visit. The clients' attitudes about their role during a medical visit, their illness, and the physician's role all impact the client's information seeking behaviors (Buller & Buller, 1987; DiMatteo & Hays, 1980; Frederickson, 1995; Hall et al., 1988; Mainous et al., 1992; Pratt et al., 1957; Robbins et al., 1993; Sutherland et al., 1989; Wagener & Carter, 1978). Older clients typically desire and seek less information from the provider (Beisecker, 1988; Cassileth et al., 1980; Ende et al., 1989; Hall et al., 1988; Hooper et al., 1982; Hopkins, 1986; Kaplan et al., 1995; Lenz, 1984; Waitzkin, 1985). Female clients exhibit more information seeking behaviors than male clients; male clients ask fewer questions (Hooper et al., 1982; Lenz, 1984; Waitzkin, 1985; Wallen & Stoeckle, 1979). The client's educational level influences participation during a medical visit (Coulter et al., 1994; Deber, 1994a & 1994b; Mathews, 1983; Siminoff & Fetting, 1991; Waitzkin, 1985). The literature suggests that physicians pay attention to the client's

socioeconomic status and make certain assumptions about their understanding of medical explanations, desire for information, and the motivation to learn about their health problem (Bain, 1977; Hall et al., 1988; Lenz, 1984; Pendleton & Bochner, 1990; Pratt et al., 1957; Waitzkin, 1985). Clients with higher socioeconomic status articulate their health problems better than clients with lower socioeconomic status, and thus, receive more information from the provider. The profile that emerges from the literature is that the older male client, with less education, and lower socioeconomic status is at risk for receiving minimal information from physicians. These clients typically ask fewer questions, acquire less information from the physician, and do not participate during the medical visit (Coulter et al., 1994; Hall et al., 1988; Hooper et al., 1982; Pendelton & Bochner, 1990; Siminoff & Fetting, 1991; Wallen & Stoeckle, 1979).

There are several situational variables, such as type of client, length of the medical visit, and first time vs repeat visits that relate to information exchange during the medical visit. The severity of an acute or chronic problem influences how physicians and clients interact (Ende et al., 1989; Hall et al., 1988; Waitzkin, 1985). Chronically ill clients interact and receive more information from the physician (Lidz et al., 1983). The length of the medical visit is another important variable. The longer the physician-client interaction, the more information seeking behaviors occur (Beisecker & Beisecker, 1990; Kaplan et al., 1995; Smith et al., 1981). The number of previous visits influences the provider-client interaction also. The longer the association between the physician and the client, the more information the client receives. The less the client saw the physician, the more important the physician's communication style was to the client (Buller & Buller, 1987; Frederikson, 1995; Hall et al., 1988).

Four important trends emerge from the literature regarding client satisfaction with the medical visit. First, clients rate the physician's competence on the basis of the physician's ability to interact and communicate with the client. The interpersonal aspects of the medical visit, therefore, become an important component of what the physician does (Buller & Buller, 1987; Bush et al., 1993; Hall et al., 1988).

Second, clients want to be shown respect in the form of affective behaviors, like warmth, friendliness, and courtesy (Buller & Buller, 1987; Mathews, 1983). The physician's interpersonal communication style is very important because it conveys cues to the client about the physician's evaluation of the individual. It is important to clients to have their needs met; an affiliative style of communication achieves this goal.

Third, clients would prefer to have the medical visit client-centered instead of physician-dominated (Buller & Buller, 1987; Coulter et al., 1994; DiMatteo et al., 1979; Hall et al., 1988; Roter & Hall, 1993; Street & Wiemann, 1987; Sutherland et al., 1989). Clients want the opportunity to tell their story, give their input into the interaction, and be able to ask questions. In this sense, the client wants to play an active role during the medical visit. It is interesting to note

that active participation during the medical visit does not necessarily mean the client wants to make decisions about medical options.

Finally, clients want the provider to give them information (Beisecker & Beisecker, 1990; Ende et al., 1989; Leopold et al., 1996; Ong et al., 1995; Waitzkin, 1985). Clients want information about their health problems, especially information pertaining to the impact that their health problem will have on their lifestyles (Delbanco, 1992; Hack et al., 1994). However, clients exhibit few behaviors which will effectively obtain the desired information from the physician (Beisecker & Beisecker, 1990, Cassileth et al., 1980; Kaplan et al., 1995; McIntosh, 1974; Pratt et al., 1957; Waitzkin, 1985).

Major Limitations

Most of the research related to the communication process during the medical visit was conducted in civilian settings: university outpatient settings, large health maintenance organizations, and physician group practices. Many studies have used only one study site (Beisecker & Beisecker, 1990; Bush et al., 1993; Cassileth et al., 1980; Frederikson, 1995; Hack et al., 1994; Hopkins, 1986; Miller & Mangan, 1983; Pendelton & Bochner, 1990; Stiles et al., 1979). One study (Joos et al., 1993) was conducted in the Veterans Administration, but in general, samples of the military community are missing from the literature.

Another problem with the medical visit research to date is that researchers have limited their sample to studying physicians (Bertakis et al., 1991; Brody et al., 1989; Frederikson, 1995; Joos et al., 1993; Like & Zyzanski, 1987; Robbins et al., 1993; Williams et al., 1995). When other providers are included in the study, the data is combined with physician data and reported as a group. Communication behaviors among physicians, nurse practitioners, and physician assistants may not be equivalent.

Another limitation of current studies that curtail generalizability is the use of convenience samples. This sampling technique can lead to over-representation of certain populations, such as females, Caucasians, younger clients, and healthy clients (Bertakis et al., 1991; Brody et al., 1991; Bush et al., 1993; DiMatteo & Hays, 1980; Frederikson, 1995; Joos et al., 1993; Like & Zyzanski, 1987; Mainous et al., 1992; Putnam et al., 1985; Smith et al., 1981; Wagener & Carter, 1978; Wartman et al., 1983; Williams et al., 1995).

## Results

Although physician-client communication has been studied extensively, a review of the literature yielded no questionnaires suitable for quantifying providers' information giving and clients' information seeking behaviors (Bagley-Burnett, 1988; Bertakis et al., 1991; Levinson, et

al., 1993; Roter & Russell, 1994; Sanchez-Menegay & Stalder, 1994). However, the Information Preference Questionnaire (IPQ) developed by Hopkins (1986) was designed to assess the degree to which cancer patients sought information about chemotherapy treatment. Hopkins' subsequent work on developing a questionnaire to assess information seeking behavior in the general patient population (Hopkins personal communication, 1995), prompted the present attempt to create more broadly applicable measures of information giving and information seeking behavior suitable for use with primary care providers and clients. Thus, the IPQ was modified first to create a general information seeking questionnaire and then to create an information giving questionnaire. Results of the analysis of the reliability and validity of the questionnaires are provided in Chapter 9. Copies of the questionnaires are provided in Appendix A. Descriptions of the basic demographic characteristics of the provider and client samples are provided in Chapter 1. Results of the analysis of the differences among provider types in experience and utilization are described in Chapter 2.

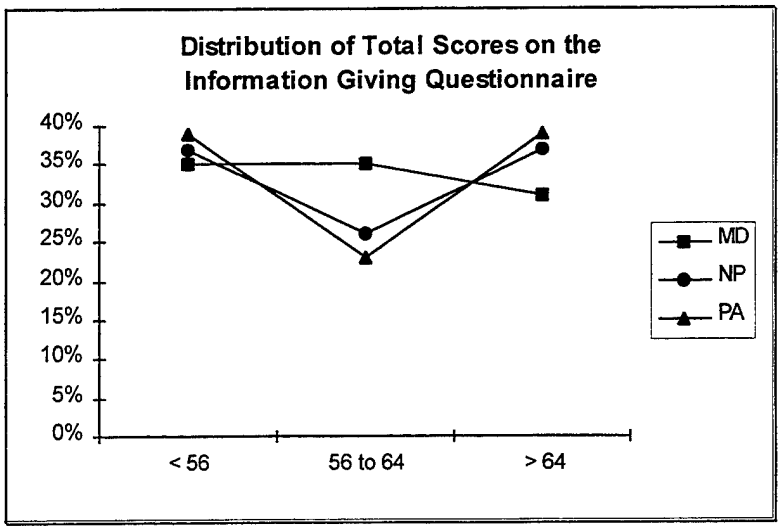
Characteristics of the Information Giving Variable

The objective of this portion of the data analysis was to describe the nature of the data collected on the providers' attitudes about sharing information with their clients and the clients' attitudes about obtaining information about their health conditions. Frequency analysis of items on the information giving questionnaire revealed good agreement among providers about the ability of knowledge to enhance health, the importance of encouraging clients to ask questions, and the importance of tailoring the information exchange to client needs. Over 80% of providers rated items 1, 5, 12, 15, and 16 "true most of the time" or "always true" (see Appendix A). Interestingly, 76% of providers rated item 11, "clients listen carefully," as "never true," "sometimes true" or "usually true," while 79% of providers rated item 10, "family, friends, and co-workers can be good sources of information," as "never true," "sometimes true" or "usually true." There were three items on which providers had diverse opinions; they were essentially equally divided among ratings on items concerned with encouraging clients to "get information from as many people as possible," "read everything they can," and "to know everything there is to know about their treatment and why they are getting it" (items 2, 4, and 8).

Total scores on the information giving questionnaire ranged from 40 to 76. A score above 64 indicated a strong belief in the value of providing information to and exchanging information with the client. A score of less than 56 was associated with misgivings about whether clients wanted information exchange or knew how to use information appropriately. Figure 6-1 illustrates the distribution of scores on the information giving variable. Mean total scores on the information giving questionnaire were 60.00, 60.32, and 60.69 for MDs, NPs, and PAs, respectively. A one-

way analysis of variance was used to determine whether mean differences among the three groups of providers were statistically significant. Groups were not significantly different.

**Figure 6-1**




Intercorrelations of Practice Style Variables

The objective of this portion of the data analysis was to quantify the relationship between information giving and other practice style variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 6-1 provides the intercorrelation matrix of these variables. It is clear from the data in Table 6-1 that there was a good deal of overlap among the practice style variables. There was a strong positive correlation between information giving and three of the five other variables: collaboration, practice model, and autonomy. The two variables, collaboration and information giving, may represent two dimensions of a single construct: collaboration with peers vs collaboration with clients. Providers who value collaboration in one setting are more likely to value it in the other as well, hence the positive correlation. The correlation between practice model scores and information giving scores was not surprising; a holistic model of practice presupposes that the provider must engage the client in order to promote an understanding of the psycho-social and physiological aspects of health and wellness. The relationship between information giving and autonomy is less easily explained. However, part of the role of the primary care provider is to act as a "gatekeeper." This role influences the nature of the information the provider may share with the client. The more autonomy a provider has, the more likely he or she is to feel free to exercise personal judgment in this arena. Thus, autonomy and information giving covaried positively, when one was high, so was the other.

**Table 6-1**

**Intercorrelation Matrix of Practice Style Variables**

| N = 58 | Practice Model | Confidence | Autonomy | Collaboration | Information Giving | Job Satisfaction |
|---|---|---|---|---|---|---|
| Practice Model | 1.00 | | | | | |
| Confidence | 0.38 | 1.00 | | | | |
| Autonomy | 0.35 | 0.41 | 1.00 | | | |
| Collaboration | 0.32 | 0.25 | 0.56 | 1.00 | | |
| Information Giving | 0.41 | 0.36 | 0.52 | 0.43 | 1.00 | |
| Job Satisfaction | 0.28 | 0.23 | 0.54 | 0.45 | 0.30 | 1.00 |

Information Seeking

Frequency analysis of items on the information seeking questionnaire revealed good agreement among clients about the desire to understand their health problem, the value of obtaining knowledge before treatment takes place, and the belief that knowledge enhances recovery. On the latter point, providers and clients agreed. Over 70% of clients rated items 3, 7, 9, and 12 "true most of the time" or "always true" (see Appendix A). Interestingly, 82% of clients rated item 10, "family, friends, and co-workers can be good sources of information," as "never true" "sometimes true" or "usually true." This issue was another issue on which clients and providers agreed. There was substantial diversity of opinion among clients on the remaining items.

A score of more than 45 on the information seeking questionnaire indicated a strong desire to obtain extensive information from a variety of sources. A score of less than 37 indicated disinterest in detailed information exchange or misgivings about obtaining information from sources other than the health care provider. It is clear from the variability seen in Table 6-2, that the questionnaire was able to discriminate among different levels of information seeking.

**Table 6-2**

**Characteristics of Information Seeking Variables**

| Variable | n | minimum score | maximum score | mode | median | mean | standard deviation |
|---|---|---|---|---|---|---|---|
| Information Seeking Day of Visit | 218 | 12 | 60 | 42 | 41 | 40.4 | 9.0 |
| Information Seeking Six Months after Visit | 167 | 5 | 60 | 44 | 43 | 40.2 | 10.5 |

Characteristics of Client Samples: Day of Visit vs Six Months

The dataset used to study information seeking on the day of the visit included 218 clients. Six months later, 167 of those clients returned follow-up questionnaires. The objective of this portion of the data analysis was to describe differences between the 167 clients who completed the entire study (completion group) and the 51 who completed only the first phase (attrition group). A chi square test of independence was used to determine the statistical significance of differences. A disproportionate number of the attrition group were active duty personnel (39% in the attrition group vs 20% of the completion group), $\chi^2$ (3) = 16.39, $p$ = 0.001, were in the younger age group (35% in the attrition group vs 20% of the completion group), $\chi^2$ (2) = 8.31, $p$ = 0.02, and had an ethnic background other than Caucasian, African-American, or Hispanic (18% in the attrition group vs 8% of the completion group), $\chi^2$ (3) = 8.08, $p$ = 0.04. However, the groups were not significantly different in terms of gender, educational level, income, symptoms, or comorbidity.

Group Differences on the Day of the Visit to the Clinic

The objective of this portion of the data analysis was to identify subgroups of the sample that differed in information seeking on the day of the clinic visit. A series of one way analyses of variance were used to highlight group differences among beneficiary categories, age groups, genders, ethnic groups, educational backgrounds, income groups, symptom conditions, comorbid conditions, clinic use, and clinic type.

Beneficiary Category. Clients were divided into four groups on the basis of their beneficiary category: active duty service members ($n$ = 44, mean = 39.95), family of active duty service members ($n$ = 88, mean = 41.09), retired service members ($n$ = 36, mean = 39.50), and family of retired service members ($n$ = 50, mean = 40.10). There were no significant differences among the groups.

Age Groups. Clients were divided into three groups on the basis of their age: under 30 years old ($n$ = 51, mean = 40.92), 30 to 50 years old ($n$ = 103, mean = 40.00), and over 50 years old ($n$ = 64, mean = 40.53). There were no significant differences among the groups.

Genders. Clients were divided into two groups on the basis of their gender: male ($n$ = 55) and female ($n$ = 159). There were no significant differences among the groups (means were 39.75 and 40.58, respectively).

Ethnic Groups. Clients were divided into four groups on the basis of their ethnicity: Hispanic (n = 14, mean = 40.86), African American (n = 37, mean = 41.24), Caucasian s(n = 145, mean = 40.14), and all others (n = 22, mean = 40.09). There were no significant differences among the groups.

Educational Backgrounds. Clients were divided into six groups on the basis of their educational background: less than high school/high school equivalency diploma/completed high school (n = 50, mean = 39.86), some college (n = 57, mean = 39.46), some college with a certificate or license (n = 19, mean = 42.89), two year college degree (n = 23, mean = 41.65), four year college degree (n = 47, mean = 40.55), and graduate college degree (n = 22, mean = 40.00). There were no significant differences among the groups.

Income Groups. Clients were divided into five groups on the basis of their total annual family income: less than $21,000 (n = 31, mean = 41.00), $21,000 to $40,000 (n = 81, mean = 39.96), $41,000 to $60,000 (n = 46, mean = 41.57), $61,000 to $80,000 (n = 28, mean = 41.71), and more than $80,000 (n = 21, mean = 36.33). There were no significant differences among the groups.

Number of Symptoms. Clients were divided into four groups on the basis of the number of symptoms they had on the day of the clinic visit: one symptom (n = 132), two (n = 39), three (n = 27), and four or five (n = 20). Groups were not significantly different (mean for clients with one symptom = 40.04, two symptoms = 40.03, three symptoms = 43.74, and four or five symptoms = 38.50).

Types of Symptoms. Clients were divided into nine groups on the basis of the nature of their primary symptom on the day of the clinic visit. The most common reason for the visit was the need for a preventive medicine procedure (such as a pap smear or a prostate examination). The next most common reason was an upper respiratory problem (including cold, flu, sinus infection, asthma, etc.), followed by musculoskeletal problems (pain, swelling, or fracture of any bone, joint, or muscle), back pain, gynecological problems (ranging from sexually transmitted disease to contraception), skin problems (such as rashes or insect bites), gastrointestinal upset (vomiting, diarrhea), and hypertension. The final category included all other problems (such things as cancer, diabetes, tooth pain, etc., each of which occurred in only one or two clients). Groups were not significantly different (Table 6-3).

**Table 6-3**

**Information Seeking by Symptom Category**

| Reason for Visit | n | mean | standard deviation |
|---|---|---|---|
| Preventive Medicine | 56 | 41.25 | 9.77 |
| Upper Respiratory | 40 | 38.50 | 9.08 |
| Musculoskeletal | 29 | 40.07 | 8.43 |
| Back Pain | 15 | 41.60 | 9.21 |
| Skin | 12 | 40.00 | 6.18 |
| Gastrointestinal | 12 | 40.92 | 9.38 |
| Hypertension | 10 | 39.30 | 7.54 |
| Gynecology | 8 | 43.50 | 11.33 |
| Other | 36 | 40.36 | 9.01 |

Number of Comorbid Conditions. Clients were divided into five groups on the basis of the number of comorbid conditions they had on the day of the clinic visit: none ($n$ = 63), one ($n$ = 68), two ($n$ = 40), three ($n$ = 21), and four or five ($n$ = 26). Groups were not significantly different (mean for clients with no conditions = 37.84, one condition = 40.84, two conditions = 42.35, three conditions = 41.19, and four or five conditions = 41.57).

Types of Comorbid Conditions. Clients were divided into six groups on the basis of the nature of their primary comorbid condition on the day of the clinic visit. Almost a third of the clients reported no comorbidity. The most common comorbid condition was hypertension, followed by back pain, musculoskeletal problems, and upper respiratory problems. The final category included all other problems. Groups were significantly different, $F$ (5, 212) = 2.30, $p$ = 0.05 (Table 6-4).

**Table 6-4**

**Information Seeking by Comorbidity Category**

| Comorbidity Category | n | mean | standard deviation |
|---|---|---|---|
| No Comorbidity | 61 | 37.70 | 9.41 |
| Hypertension | 39 | 41.41 | 7.72 |
| Back Pain | 25 | 43.20 | 11.00 |
| Musculoskeletal | 20 | 40.05 | 9.07 |
| Upper Respiratory | 15 | 38.07 | 7.43 |
| Other | 58 | 41.97 | 8.24 |

Clients with back pain had the highest information seeking scores, while those with no comorbidity had the lowest scores. Table 6-5 shows the results of a priori least squares mean

comparisons among all the groups. In effect, the table shows that clients with no comorbidity are not as concerned with information seeking as those who have some comorbidity (regardless of the nature of the comorbidity).

**Table 6-5**

**P Values for Comparisons of Information Seeking Means by Comorbidity Category**

| Comorbidity Category | None | Hyper-tension | Back Pain | Musc. | Upper Resp. | Other |
|---|---|---|---|---|---|---|
| No Cormorbidity | | .04 | .001 | .31 | .89 | .001 |
| Hypertension | | | .43 | .58 | .22 | .76 |
| Back Pain | | | | .24 | .08 | .56 |
| Musculoskeletal | | | | | .51 | .41 |
| Upper Respiratory | | | | | | .13 |
| Other | | | | | | |

Clinic Use. Clients were divided into four groups on the basis of the number of visits they reported having made during the six month period of the study: one visit (n = 70), two visits (n = 32), three visits (n = 32), and four to ten visits (n = 33). Groups were not significantly different (mean for one visit = 40.06, two = 38.97, three = 40.69, four to ten = 40.58).

Clinic Type. Clients were divided into three groups on the basis of the type of clinic they were using (see Chapter 9): Type I (n = 52), Type II (n = 62), and Type III (n = 53). A Type I clinic saw predominantly active duty clients in a Troop Medical Clinic setting, but also provided care to family members of active duty personnel. These clinics rarely or never treated retirees or their family members. Type I clinics used a non-physician provider to physician ratio of 2:1. Four of the nine clinics in the study were Type I clinics. A Type II clinic saw family members of active duty personnel, as well as retirees and their family members. Active duty personnel were not seen in these clinics. Three of the nine clinics in the study were Type II clinics. A Type III clinic saw a significant number of clients from each of the four beneficiary categories. Type III clinics used a non-physician provider to physician ratio of 1:2. Two of the nine clinics in the study were Type III clinics. Groups were not significantly different (mean for Type I = 40.67, Type II = 40.73, Type III = 39.52).

Intercorrelations of Information Giving and Key Client Variables

The objective of this portion of the data analysis was to quantify the relationship of information giving to client information seeking and health outcome variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 6-6 provides the intercorrelation matrix of these variables.

**Table 6-6**

**Intercorrelation Matrix of Information Giving and Key Client Variables**

| | | | Day of Visit[a] | | | | | | 1 Week[b] | | 6 Months[c] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IG | Symp | Co-m | IS 0 | FS 0 | HS 0 | CS 0 | FS 1 | HS 1 | IS 6 | FS 6 | HS 6 | CS 6 |
| Day of Visit[a] | Symp | -0.10 | 1.00 | | | | | | | | | | | |
| | Co-m | -0.01 | 0.21 | 1.00 | | | | | | | | | | |
| | IS 0 | 0.02 | -0.01 | -0.12 | 1.00 | | | | | | | | | |
| | FS 0 | 0.00 | -0.44 | -0.36 | 0.07 | 1.00 | | | | | | | | |
| | HS 0 | 0.00 | 0.36 | 0.35 | -0.01 | -0.80 | 1.00 | | | | | | | |
| | CS 0 | -0.08 | 0.08 | 0.02 | 0.09 | -0.19 | 0.07 | 1.00 | | | | | | |
| One Week[b] | FS 1 | -0.01 | -0.29 | -0.41 | 0.04 | 0.73 | -0.71 | -0.10 | 1.00 | | | | | |
| | HS 1 | 0.02 | 0.26 | 0.37 | -0.06 | -0.66 | 0.80 | 0.02 | -0.83 | 1.00 | | | | |
| Six Months[c] | IS 6 | -0.03 | -0.07 | -0.14 | 0.55 | 0.12 | -0.04 | 0.09 | 0.10 | -0.08 | 1.00 | | | |
| | FS 6 | 0.00 | -0.35 | -0.38 | 0.12 | 0.56 | -0.53 | -0.12 | 0.59 | -0.56 | 0.21 | 1.00 | | |
| | HS 6 | 0.04 | 0.35 | 0.40 | -0.10 | -0.56 | 0.66 | 0.00 | -0.60 | 0.71 | -0.11 | -0.85 | 1.00 | |
| | CS 6 | -0.08 | 0.13 | 0.03 | 0.05 | -0.11 | 0.00 | 0.73 | -0.05 | -0.02 | 0.14 | -0.11 | 0.05 | 1.00 |

[a] Sample size = 218.
[b] Sample size = 216.
[c] Sample size ranges from 160 to 167.

**Legend for Table 6-6**

IG = information giving score

Symp = average rating of severity of symptoms on the day of the clinic visit

Co-m = average rating of severity of co-morbidity on the day of the clinic visit

IS 0 = information seeking score on the day of the clinic visit

FS 0 = functional status score on the day of the clinic visit

HS 0 = health status score on the day of the clinic visit

CS 0 = satisfaction score on the day of the clinic visit

FS 1 = functional status score one week after the clinic visit

HS 1 = health status score one week after the clinic visit

IS 6 = information seeking score six months after the clinic visit

FS 6 = functional status score six months after the clinic visit

HS 6 = health status score six months after the clinic visit

CS 6 = satisfaction score six months after the clinic visit

Remarkably, there was no evidence of any meaningful simple bivariate linear relationship between the provider's information giving level and the client's condition or outcomes. Information seeking was not correlated with symptom severity or comorbidity at the time of the visit or with

functional or health status at the time of the clinic visit, one week later, or six months later. Apparently, in these primary care clinics the quality of the interaction with the provider and health care services in general were adequate to meet the needs of the clients, regardless of the severity of their illness or injury. Information seeking on the day of the visit was strongly and positively correlated with information seeking at six months, an indication of the test-retest reliability of the questionnaire.

## Relationship of Information Giving and Information Seeking to Client Satisfaction

### Client Satisfaction on the Day of the Visit

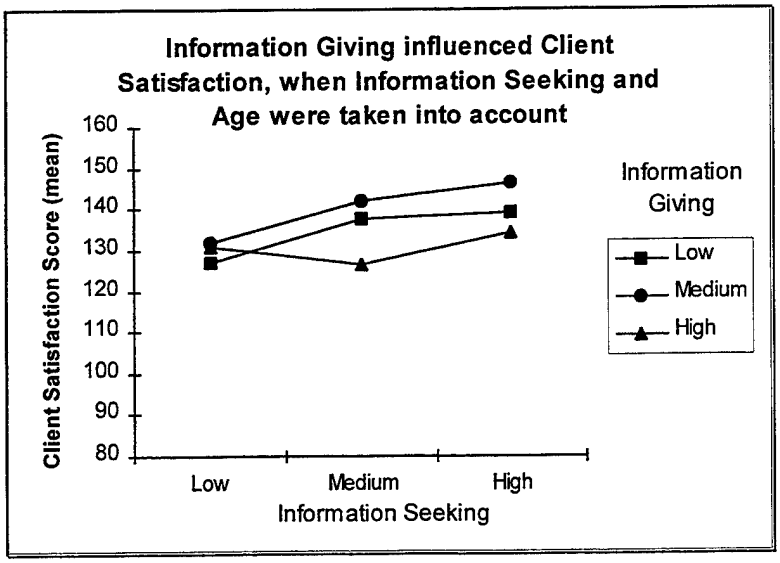
The objective of this portion of the data analysis was to quantify the relationship of provider information giving and client information seeking to client satisfaction with health care services. Characteristics of the client satisfaction data are described in Chapter 7. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 analysis of variance with one covariate was used. Provider information giving (levels = low, medium, and high) was the first factor in each analysis and the second was client information seeking (levels = Low, Medium, and High). These two factors were both between-groups factors. Age of the client was included as a covariate in the model due to its association with client satisfaction (see Chapter 7). In this way, it was possible to hold constant the effect of age, while assessing whether the practice style of the provider combined with the needs of the client influenced client satisfaction.

Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 71 clients whose providers scored in the Low group, 64 whose providers scored in the Medium group, and 83 whose providers scored in the High group. Clients were divided into three groups on the basis of their total score on the information seeking questionnaire: Low scored below 37, Medium scored between 37 and 45, and High scored above 45. There were 66 clients who scored in the Low group, 85 who scored in the Medium group, and 67 who scored in the High group.

The main effect of Age was significant, $F$ (1, 208) = 7.43, $p$ = 0.007. The main effect of Information Giving was marginally significant, $F$ (2, 208) = 2.74, $p$ = 0.07. The main effect of Information Seeking was not significant, nor was their interaction. When means were adjusted to account for the client's age and information seeking level, as well as the information giving level of the provider, clients who saw providers who scored in the middle range on the information giving measure tended to be more satisfied (mean = 140.14) than those who saw providers who scored in the low or high range (mean = 134.51 and 130.56 respectively). Figure 6-2 shows the means

for each of the nine groups in the analysis (the interaction of information giving and information seeking). This figure clearly illustrates the marginally significant main effect; that is, clients were most satisfied when the provider scored in the medium range of the information giving scale. Interestingly, this figure also makes it obvious that having a provider whose level of information giving matched the client's level of information seeking was not associated with higher levels of client satisfaction. For example, clients who scored high on information seeking and who saw a provider who scored high on information giving were no more satisfied than clients who scored high on information seeking and saw a provider who was low in information giving.

**Figure 6-2**




Client Satisfaction Six Months Later

All of the analyses of the six month follow-up data were based on the assumption that the initial visit with a provider could influence long-term health and satisfaction (via identification of a chronic illness, health education, referral for additional care, referral for specialty care, etc.). However, no attempt was made in this prospective observational study to control the number of visits that clients made to the clinic or the types of providers seen on subsequent visits. Thus, the results of analyses of the impact of information exchange (between client and provider during the original visit) on six month follow-up data must be cautiously interpreted.

The objective of this portion of the data analysis was to quantify the relationship of provider information giving and client information seeking to changes in client satisfaction over time. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 53 clients whose providers scored in the Low group, 52 whose providers

scored in the Medium group, and 62 whose providers scored in the High group. Clients were divided into three groups on the basis of their total score on the information seeking questionnaire: Low scored below 37, Medium scored between 37 and 45, and High scored above 45. There were 52 clients who scored in the Low group, 69 who scored in the Medium group, and 46 who scored in the High group.

A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 analysis of variance with one covariate was used. Provider information giving (levels = low, medium, and high) was the first factor in each analysis and the second was client information seeking (levels = Low, Medium, and High). These two factors were both between-groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit vs Six Months Later). Age of the client was included as a covariate in the model due to its association with client satisfaction. In this way, it was possible to hold constant the effect of age, while assessing whether the practice style of the provider, combined with the needs of the client, influenced the change in client satisfaction over time. The main effect of Age was significant, $F$ (1, 155) = 11.17, $p$ = 0.001, as was the main effect of Time, $F$ (1, 155) = 9.86, $p$ = 0.002. No other main effects or interactions were significant. When age was held constant, client satisfaction declined over the six month period, regardless of the provider's level of information giving or the client's level of information seeking (mean on the day of the visit = 136.00 and mean six months later = 128.91). Apparently, clients rated services more positively when they were rating a specific visit to the clinic, rather than their general experience.

## Relationship of Information Giving and Information Seeking to Functional Status Recovery

### Functional Status One Week Later

The objective of this portion of the data analysis was to quantify the relationship of provider information giving and client information seeking to the change in client functional status during the week following a visit. Characteristics of the functional status data are described in Chapter 8. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 mixed analysis of variance with two covariates was used to analyze the data. Provider information giving (levels = low, medium, and high) was the first factor in each analysis and the second was client information seeking (levels = Low, Medium, and High). These two factors were both between groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit versus One Week Later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with functional status (see Chapter 8). In this way, it was possible to hold constant the effects of symptom

severity and comorbidity while assessing whether the practice style of the provider, combined with the needs of the client, influenced the change in client functional status.

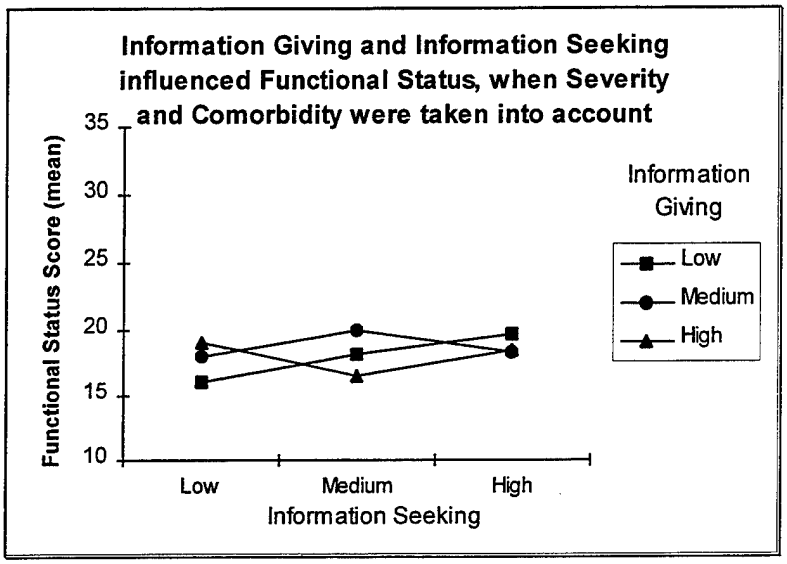
Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 28.83, $p$ = 0.0001 and $F$ (1, 205) = 30.47, $p$ = 0.0001, respectively. The main effect of Time was significant, $F$ (1, 205) = 9.75, $p$ = 0.002, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 10.91, $p$ = 0.001. No other main effects or interactions were statistically significant. This pattern of results verified that the more severe the clients' symptoms and comorbidity were, the worse the functional status was on the day of the clinic visit. However, the more severe the clients' initial symptoms were, the more recovery was evident one week later. In short, sick clients got better and healthy clients stayed that way. Furthermore, when severity and comorbidity were held constant, neither the provider's level of information giving, nor the client's level of information seeking influenced the degree of recovery in functional status at one week.

Functional Status Six Months Later

The objective of this portion of the data analysis was to quantify the relationship of provider information giving and client information seeking to the change in client functional status during the six months following a clinic visit. The same analysis of variance and covariance approach used at one week was used to analyze the data. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 41.08, $p$ = 0.0001 and $F$ (1, 156) = 24.52, $p$ = 0.0001, respectively. The main effect of Time was not significant, nor did it interact significantly with any other variable. In short, when severity and comorbidity were held constant, functional status at six months was equivalent to functional status on the day of the visit and neither the provider's level of information giving, nor the client's level of information seeking influenced the degree of recovery in functional status. However, the interaction of information giving and information seeking was significant, $F$ (1, 156) = 2.50, $p$ = 0.05. Figure 6-3 shows the means for each of the nine groups in the analysis (the interaction of information giving and information seeking). Low scores on the functional status questionnaire indicate good functional status. Least squares comparisons of these means reveals that (a) when a provider scored high on information giving, the functional status of clients who scored in the medium range on the information seeking measure was better ($p < 0.01$) than that of those who scored either low or high, (b) when a provider scored low on information giving, the functional status of clients who scored low on the information seeking measure was better ($p < 0.01$) than that of those who scored either high or in the medium range, and (c) when a provider scored in the medium range on information giving, the functional status of clients did not differ significantly across levels of information giving. Interestingly, this figure also shows that having a provider whose level of

information giving matched the client's level of information seeking was not associated with better functional status. For example, the functional status of clients who scored high on information seeking and who saw a provider who scored high on information giving was not significantly different from that of clients who scored high on information seeking and saw a provider who was low in information giving.

**Figure 6-3**




Relationship of Information Giving and Information Seeking to Health Status Recovery

Health Status One Week Later

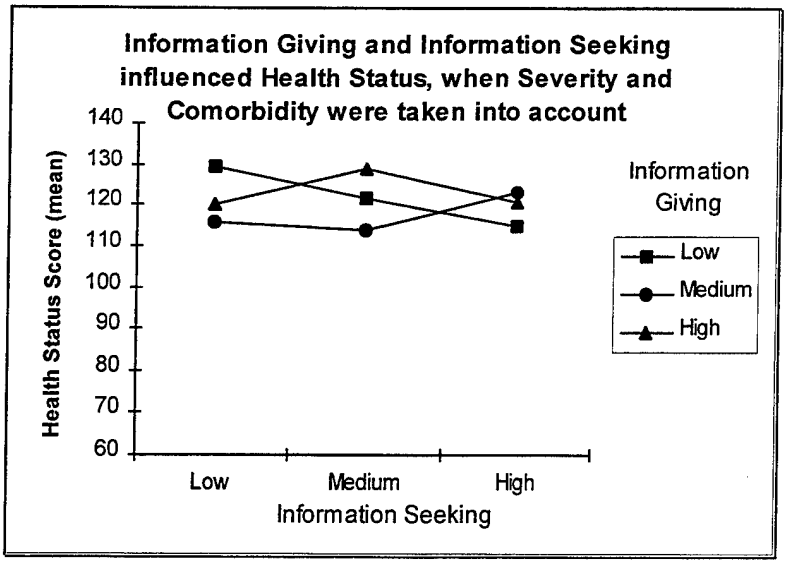
The objective of this portion of the data analysis was to quantify the relationship of provider information giving and client information seeking to the change in client health status during the week following a visit. Characteristics of the health status data are described in Chapter 8. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 mixed analysis of variance with two covariates was used to analyze the data. Provider information giving (levels = low, medium, and high) was the first factor in each analysis and the second was client information seeking (levels = Low, Medium, and High). These two factors were both between groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit versus One Week Later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with health status (see Chapter 8). In this way, it was possible to hold constant the effects of symptom severity and comorbidity while assessing whether the practice style of the provider combined with the needs of the client influenced the change in client health status.

Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 21.72, $p$ = 0.0001 and $F$ (1, 205) = 24.19, $p$ = 0.0001, respectively. The main effect of Time was significant, $F$ (1, 205) = 5.94, $p$ = 0.02, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 5.52, $p$ = 0.02. No other main effects or interactions were statistically significant. This pattern of results verified that the more severe the clients' symptoms and comorbidity were, the worse the health status was on the day of the clinic visit. However, the more severe the clients' initial symptoms were, the more recovery was evident one week later. In short, sick clients got better and healthy clients stayed that way. Furthermore, when severity and comorbidity were held constant, neither the provider's level of information giving, nor the client's level of information seeking influenced the degree of recovery in health status at one week.

Health Status Six Months Later

The objective of this portion of the data analysis was to quantify the relationship of provider information giving and client information seeking to the change in client health status during the six months following a clinic visit. The same analysis of variance and covariance approach used at one week was used to analyze the data. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 30.77, $p$ = 0.0001 and $F$ (1, 156) = 22.43, $p$ = 0.0001, respectively. The main effect of Time was not significant, nor did it interact significantly with any other variable. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the provider's level of information giving, nor the client's level of information seeking influenced the degree of recovery in health status. However, the interaction of information giving and information seeking was significant, $F$ (1, 156) = 2.70, $p$ = 0.03. Figure 6-4 shows the means for each of the nine groups in the analysis (the interaction of information giving and information seeking). High scores on the health status questionnaire indicate good health status. This pattern of results is equivalent to that seen with functional status at six months.

**Figure 6-4**




Conclusions

(1) In contrast to the results of previous research, there were no significant differences in information seeking scores for different beneficiary categories, age groups, genders, ethnic groups, educational levels, income groups, levels of severity of illness/injury, or clinic types.

(2) Congruent with previous research, clients with comorbidity scored higher on the information seeking questionnaire than those without.

(3) Clients and providers agreed that information about health conditions and treatment plans should enhance recovery from illness/injury and maintain health and wellness.

(4) Clients and providers agreed that family, friends, and co-workers were not good sources of information about health problems, a finding that was not consistent with published research.

(5) The average level of information giving was not significantly different across the three types of providers.

(6) Information giving scores were positively correlated with practice model scores. The result was not surprising given that the holistic model of practice espoused by the majority of providers dictates a need to exchange information with the client to promote an understanding of health and wellness and given the research on the correlation between an affiliative communication style and the amount of information exchanged during the medical visit.

(7) Information giving scores were positively correlated with collaboration scores. Although this relationship has not been investigated before, it is likely that it is an indication that collaboration with peers generalizes to collaboration with clients.

(8) Information giving scores were positively correlated with autonomy scores. This relationship has not been investigated previously. The "gatekeeper" role of the primary care provider influences the nature of the information the provider may share with the client. Providers with high autonomy are more likely to be comfortable exercising personal judgment in this area.

(9) Clients tended to score higher on the satisfaction questionnaire when the provider scored in the medium range on the information giving questionnaire. This was true regardless of the client's score on the information seeking scale. In fact, a match between the client's information seeking score and the provider information giving score (e.g., low with low or high with high) was not associated with higher levels of satisfaction.

(10) Neither the provider's level of information giving nor the client's level of information seeking influenced satisfaction six months after a visit to the clinic.

(11) Neither the provider's level of information giving nor the client's level of information seeking influenced recovery of either functional status or health status in the week following a visit to the clinic.

(12) The clients who scored low on the information seeking questionnaire and saw a provider who scored low on the information giving questionnaire had the best functional and health status, while the clients who scored in the medium range on the information seeking questionnaire and saw a provider who scored in the medium range on the information giving questionnaire had the worst functional and health status.

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# CHAPTER 7

# CLIENT SATISFACTION

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## Introduction

The primary reasons for studying client satisfaction with health care are improving client outcomes, obtaining client feedback, and obtaining or maintaining business. A major reason for studying client satisfaction is to improve client outcomes. There is support for a link between client satisfaction and such behaviors as keeping medical appointments and complying with recommended treatment and medication use (Aharony & Strasser, 1993; Cleary & McNeil, 1988; Pascoe, 1983; Williams, 1994). Some experts believe satisfaction is a prerequisite to quality care (Cleary & McNeil, 1988; Donabedian, 1988; Williams, 1994).

A second reason for studying client satisfaction is to obtain feedback on the quality of care. This feedback helps health care agencies and providers identify areas for service improvement and program expansion.

In keeping with the times, studying client satisfaction is a marketing issue. Health care agencies must compete for client business. If agencies want to stay in the health care marketplace, maintaining clients and expanding the client-base is essential. When clients are satisfied they come back for care and medical services. Understanding client behavior in terms of consumerism (that is, understanding how clients select health care facilities and choice of health care providers) is critical to developing good marketing plans and providing cost-efficient services. Researchers have been interested in client satisfaction since the 1960's. Over the last thirty-five years, client satisfaction has been studied extensively (Aharony & Strasser, 1993; Cleary & McNeil, 1988; Johnson, 1996; Lockman, 1983; Pascoe, 1983; Ware, Davies-Avery & Stewart, 1978; Williams, 1994). The results from the research literature are confusing, conflicting, and largely unfocused.

Measuring client satisfaction in the military health care system is also not a novel idea (Grant, 1982; Johnson, 1996; Mangelsdorff, 1979 & 1994; Mangelsdorff, Twist, Zucker, Ware, & George, 1992). Some studies have assessed client satisfaction by sending out surveys based on a randomized list from the Defense Eligibility Enrollment Reporting System (DEERS), while others have assessed satisfaction immediately after a medical visit and reassessed it with longitudinal follow-up.

## Literature Review

Several common themes can be extracted from the literature on client satisfaction. The review of the literature is organized according to Aharony and Strasser's (1993) determinants of client satisfaction: client sociodemographic data, physical/psychological health, attitudes/expectations, and organizational structure.

Client Sociodemographic Data[1]

There are numerous studies that have examined the influence of client sociodemographic variables on client satisfaction. The most consistent finding is that client age and gender are positively related with satisfaction (Aharony & Strasser, 1993).

Hulka, Kupper, Daly, Cassel, and Schoen (1975) examined correlates of satisfaction with medical care by sampling 1,713 adults in a household survey. Stratum sampling and census tracts were randomly selected and proportionate representation from each stratum and census tract was used. In their sample, the majority of clients were 60 years or older, 90% were Caucasians, and 62% were female. Overall, the clients were satisfied with health services: females were more satisfied than males; African-Americans had a lower proportion of high satisfaction scores than Caucasian; and clients with a lower socioeconomic status were the least satisfied with all aspects of medical services. These researchers also found that clients were more satisfied when they had the same physician for each visit.

Tessler and Mechanic's (1975) survey study compared client satisfaction with medical services between a group participating in a pre-paid group practice plan (N = 356) and a group participating in a fee-for-service insurance plan (N = 354). Overall, the clients were satisfied with medical services. However, the fee-for-service group was more satisfied with medical services than the pre-paid group. Married clients had lower levels of satisfaction with medical services than single clients.

Doyle and Ware (1977) studied physicians' conduct and other factors that affect client satisfaction with medical services. The sample consisted of 400 households where one adult per household participated in the study. These researchers used a mixed sampling design consisting of cluster, regular interval, and proportional stratified techniques to obtain the sample. Only educational level influenced client satisfaction with medical services. These researchers found overall satisfaction was greater for the more educated clients related to access, convenience, and provider interpersonal characteristics .

Zapka (1979) evaluated member satisfaction in a university-base Health Maintenance Organization (HMO). The sample contained 538 clients, with a survey return rate of 72%. Results indicated satisfaction with the HMO plan was high. These researchers found no sociodemographic variables that served as determinants of satisfaction with medical services.

Chaska et al. (1980) examined client satisfaction with ambulatory care in a rural Minnesota county. Stratified sampling was utilized, surveying 427 households (A sample size of 1,332 adults). Clients were asked to recall health experiences at the end of one year. Males

[1] Some of the sociodemographic variables are reviewed in chapter 6. The review in this chapter focuses on overall client satisfaction with health care delivery.

were more satisfied with medical services than females. Males also utilized the medical services 33% less than female clients. The sociodemographic variables of income and educational level did not significantly relate to the usage of medical services. Ten percent of the sample consumed 50% of the services. The heavy users were slightly older females, housewives, or retired persons. Clients in the low income level were significantly less satisfied with emergency care as compared to other income groups. The higher the educational level, the more dissatisfied they were with medical services. Clients with ten or more visits were the most satisfied with the way in which their questions were answered (as compared to medium and low users).

Fox and Storms (1981) proposed a model in which satisfaction was the result of a match between the client's condition of care and the client's orientation toward care. This model was tested in the Baltimore metropolitan area with 2,021 clients. A 98% response rate was achieved. Females with less education, that were older, had a lower income, were retired or a homemaker, were most likely to be satisfied. Age was the best predictor of satisfaction with medical services, while age and gender were good predictors of health care utilization.

Grant (1982) examined client satisfaction with health services in a military setting. This study was conducted at Letterman Army Medical Center, San Francisco, California. Surveys were available at magazine tables in the lobby and clinic waiting areas. This convenience sample consisted of 216 clients (62% were dependents, 54% enlisted sponsors, 45% officer sponsors, 28% retired members, and 42% had at least seven outpatient visits in the year. The clients were much happier with the military medical system than with civilian medicine; they liked having free medical care. Most of the clients thought military physicians were equally qualified professionally. Older clients revealed more satisfaction with military health services than younger clients.

Linn and Greenfield (1982) explored client suffering and satisfaction among the chronically ill. Three sub-specialty clinics and a large clinic at a university hospital served as study sites. The sample consisted of 519 clients, for a 65% return rate. These researchers found that as age increased, so did the level of satisfaction with medical services. Educational level was not related to satisfaction with the art of care or technical quality of care, but was significantly related to satisfaction with medical services. Clients with less education perceived the physician as helping them get better. African-American and Hispanic clients were more satisfied than Caucasians with respect to all aspects of medical service. Single, divorced, and separated clients were the least satisfied with the technical quality and did not perceive the physician as helping them get better. The retirees were the most satisfied with medical services while the unemployed clients were the least satisfied.

Pascoe and Attkison (1983) also found ethnicity and socioeconomic status to be significant predictors of satisfaction. These researchers examined satisfaction with medical care at 15 public health clinics. Clients ($\underline{N}$ = 246) were randomly assigned to six conditions (for a

response rate of 86%). These researchers used a card sort technique or a traditional survey to measure satisfaction. Caucasians reported higher levels of satisfaction with medical care than other ethnic groups. Higher socioeconomic status was significantly associated with higher satisfaction with medical services.

Treadway (1983) examined client satisfaction following an initial visit with a physician. The convenience sample consisted of 81 clients. The physicians were inexperienced (in practice for one year or less). This study supported past research regarding age; older clients were more satisfied with their medical services than younger clients.

Zastowny, Roghmann, and Hengst (1983) prepared a new analysis of four samples from prior research examining client satisfaction with medical services. The combined sample was over 1,000 clients. African-Americans were less satisfied with medical services than other ethnic groups. Clients with higher levels of education were more dissatisfied with medical services than those with lower levels of education.

Williams and Calnan (1991) examined factors related to client satisfaction with medical care in a general practice setting in England. The sample consisted of 454 clients (a 62% response rate). These researchers found that older clients were more satisfied with most aspects of primary care services than younger clients. Women were slightly less satisfied with primary services.

Using a cross-sectional design, Hsieh and Kagle (1991) examined the relationships among clients' expectations, personal health status, mode of service delivery, and satisfaction with health services. The researchers randomly sampled 10,573 university faculty and staff. The sample size was 401 (a 63% response rate). Several findings related to sociodemographic variables were found. Women were satisfied with health services if continuity of care was provided and physicians acted in a professional manner. Non-white ethnic clients were less satisfied with the availability of resources, as well as the physician's conduct. Older clients were more satisfied with the physician's conduct, less satisfied with accessibility, and more satisfied on global measures than the younger clients. Clients that utilized the clinic for three or more visits were more satisfied with the availability of health resources than clients that utilized the clinic less frequently.

Kurata, Nogawa, Phillips, Hoffman and Werblun's (1992) survey study examined both client and provider satisfaction with medical services in a university-based family practice clinic. This convenience sample consisted of 156 clients and 65 providers, including residents, staff physicians, and nurse practitioners. The results of this study were similar to other studies with respect to the variable age. Older clients were more satisfied with medical services than younger clients.

Haq's (1993) descriptive correlational study examined levels of satisfaction with primary health services at a nursing center in North Carolina. A purposive sampling technique was used to recruit 159 clients (a 69% response rate). Clients had a minimum of a high school diploma. An interesting finding from this study was the younger group (56-64 years) had the highest satisfaction with medical services, while the older group (80-90 years) were the least satisfied with medical services and access.

Hopton, Howie, and Porter (1993) did a retrospective analysis of data collected from 1,599 clients and 43 physicians assessing client satisfaction levels after a medical visit. In this study younger clients were less satisfied with the medical visit, waited longer to be seen by the physician, and were seen by a physician who was in a hurry. Younger clients believed the physician did not think their opinions were important.

Ramsey, Edwards, Lenz, Odom, and Brown (1993) studied health services associated with a rural nurse-managed clinic. This descriptive study used a systematic sampling technique to recruit 101 clients. The clients answered a telephone survey about health services provided by nurse practitioners. Virtually all of the clients (98%) were satisfied or highly satisfied with nurse practitioner services, would recommend the clinic to others, and would return to the clinic for health care.

Freeborn and Pope (1994) have examined client satisfaction with managed care associated with Kaiser Permanente, Northwest Region, for over twenty years. Annually these researchers conduct surveys of the membership. These researchers found that satisfaction with quality of care was greater for members in the higher socioeconomic levels, members making more visits, older members, and members in better health. Subscribers that terminated their membership in the HMO were younger, single, and had lived in the geographic area a shorter period of time.

Mangelsdorff (1994) and Mangelsdorff et al. (1992) examined client satisfaction with Army Medical Treatment Facilities. The sample was a list of eligible beneficiaries in the Defense Eligibility Enrollment Reporting System (DEERS) database. This research report covers the 1990, 1991, and 1992 surveys. The total sample size was 8,241 (an overall usable return rate of 29%). Retirees and their dependents were more satisfied with medical care than active duty personnel and their dependents. This finding reflects the difference between older and younger clients.

Weingarten et al.'s (1995) correlational study in a Kaiser Permanente HMO examined client satisfaction with health services. The sample consisted of 2,799 clients and 48 physicians. Surveys were mailed and interviews were conducted over the telephone. As has been shown in a number of studies, older clients were satisfied with medical care. They were also satisfied when preventive care services were incorporated into the medical care.

Physical and Psychological Health

Health status prior to receiving care influences a client's satisfaction level. Cleary and McNeil (1988) reviewed the literature about clients' physical and psychological health and found positive relationships between health status and satisfaction. Chaska et al. (1980) examined client satisfaction and health services among residents of a rural Minnesota county. A sample of 1,332 clients (out of 1,361) completed the survey. This group of researchers found that the disabled were less satisfied with health services than the retired, clerks, and housewives.

An examination of client involvement in the physician-client relationship found that clients' health status was an important factor in determining the degree of involvement. Clients with less serious illnesses were more engaged in the physician-client relationship (DiMatteo, Prince and Taranta, 1979).

Linn and Greenfield (1982) examined client suffering and satisfaction among the chronically ill. A sample of 519 clients returned the survey (return rate of 65%). These researchers found that clients who perceived themselves to in better health spent less time in bed due to their health problems and scored lower on the depression scale. These clients were also most satisfied with the art and technical quality of care. They perceived the physician as helping them get better.

Weiss (1988) examined client satisfaction with primary care services. The sample consisted of 400 households (an adult in the household completed the survey). Life satisfaction was significantly related to client satisfaction with health care services. The higher the level of satisfaction with life, the community, the neighborhood, and the job, the greater satisfaction there was with medical services. Clients who were more satisfied with their own health status and physical condition were more satisfied with physician care.

Weingarten et al. (1995) studied client satisfaction and adherence to preventive care practice guidelines. The sample was composed of 2,799 clients. Clients who had higher quality-of-life scores were more satisfied with their physician than those with lower quality-of-life scores.

Harris et al. (1997) used survey data from 7,313 Oregon Medicaid managed care clients. The aim of the study was to explore the effects of clients' perceptions of their providers and their managed care plans on their overall satisfaction with medical care. The survey response rate was 63%. The researchers used a stratified random sampling technique to obtain their sample. Only adult clients who were continuously enrolled in the same managed care health plan for the previous six months were surveyed. Clients' who perceived their health status positively maintained this perception over time. Healthier clients visited their provider less often, were younger, and had more education. Healthier clients, older clients, and frequent users of health services experienced greater satisfaction with their managed care plans and providers. Attitudes

about the science and art of care outweighed those about the business of care in accounting for overall client satisfaction.

Client Attitudes and Expectations

Clients have certain attitudes and expectations about the quality and comprehensiveness of medical services they receive, as well as having general expectations about social roles played in the physician-client interaction. Some of these expectations are reviewed in Chapter 6. There was evidence to support the hypothesis that expectations about health care or medical treatment influence client satisfaction with service or treatment (Ross, Frommelt, Hazelwood, & Chang, 1987). Aharony and Strasser (1993) report that expectations account for at least a small amount of the variance in client reports of satisfaction with medical services. Cleary and McNeil's (1988) review regarding client expectations found that clients with lower expectations tend to be more satisfied, while those with unrealistic expectations tended to be less satisfied.

Greenley and Schoenherr (1981) conducted a community survey and examined the organizational effects on client satisfaction. This study had a sample size of 411 clients and 417 staff members from 11 randomly selected agencies. Both clients and staff members reported high levels of satisfaction with health services. These researchers found that clients with negative expectations or experiences regarding agency services were less satisfied with the health services.

Weiss (1988) surveyed 400 households to examine client satisfaction. This researcher used cluster sampling techniques to obtain the sample. Results indicated that the clients' level of confidence in the community was the best predictor of satisfaction with health services. The more confidence the clients had in community medical care, the more satisfied they were with the medical visit. Moreover, responders with confidence in their physician had a higher level of satisfaction with health services. Finally, clients with a regular source of medical care were more satisfied with health services.

Hsieh and Kagle (1991) examined client expectations regarding health care. The researchers randomly sampled 10,573 university faculty and staff. The sample size was 401 (a 63% response rate). If clients waited a longer time than expected, they were less satisfied with medical services. Client expectations about their physician's conduct and the convenience of services were the best predictor of global satisfaction with services.

Thompson and Sunol (1995) did a literature review about client expectations. These researchers found that positive expectations increased and sustained optimism for improvement more than providing feedback on improvement of symptoms or health. High client expectations and favorable experiences led to higher levels of satisfaction with medical services more than high

expectations and unfavorable experiences. The least client satisfaction occurred when lower expectations matched unfavorable experiences.

Thompson and Yarnold (1995) examined client satisfaction as a function of waiting time, expectations, and perception. This random sample consisted of 1,574 clients seen in a community emergency room two to four weeks prior to data collection. Results from this study indicated that as perceived waiting times went from longer than expected to shorter than expected, satisfaction with medical services increased. These researchers concluded that overall client satisfaction was a function of the difference between clients' expectations and perceptions.

Organizational Structure

For the purposes of this current research study, structure of care consists of the stable characteristics of the providers of care, the resources available, and the providers' organizational setting (Donabedian, 1980). This definition implies that the physical environment, availability of resources, and the way care was organized and financed should all be considered in research on structure. Client satisfaction with health services was indirectly associated with the environmental and organizational aspects of the health care setting (Cleary & McNeil, 1988; Hutton & Richardson, 1995). Hutton and Richardson (1995) suggested that the role of the health care facility and environment is largely unstudied. Reidenbach and Sandifer-Smallwood (1990), in a survey of 300 clients, found parts of the physical appearance of a facility was highly correlated with client satisfaction for overall service in an outpatient clinic.

Continuity. Gray (1980) examined client satisfaction among 821 government employees enrolled in either a pre-paid group or fee-for-service plan. Two interviews were conducted over a year. Results indicated that fee-for-service clients had a higher percentage of persons completely satisfied with medical services. Satisfaction was linked to prior satisfaction with available services and having a personal physician.

Waiting Time. Fisher (1971) examined client satisfaction with university outpatient services. The sample consisted of 150 randomly selected clients. Clients in this study were dissatisfied with seeing a different physician at each visit, waiting a long time to see the physician, the uncomfortable seating in the waiting room, and the parking situation.

Linn et al. (1985) examined client and physician satisfaction in an internal medicine group practice. They sampled 100 clients. Client and provider satisfaction occurred when clients had continuity of care, there were low no-show/cancellation rates and reasonable charges, and when there was efficient use of ancillary staff. Clients also experienced satisfaction with services when waiting times were short.

Weinberger, Greene, and Mamlin (1981) examined client perceptions of health care in a university-based ambulatory care clinic. The sample consisted of 200 clients (a response rate of 76%). Findings indicated that clients perceived the length of time spent in the examination room as positively related to competence and personal qualities of the physician. The more time spent in the examination room, the more the physician was perceived as being competent (including the physician's inter-personal qualities). A long waiting time was negatively correlated with satisfaction with services.

Gonzalves, Minderler, and Tompkins (1995) studied the delivery of health services in an Army community hospital. A sample of 859 households were chosen from a randomized list using the DEERS database. The results indicated that clients chose the military treatment facility (MTF) because of the free medical care, convenience, and better care. Clients (48%) were dissatisfied with military health services because of the time spent waiting to see the physician once arriving at the clinic. Another source of dissatisfaction was the length of time from making the appointment to the appointment date. Clients stated that it was important to have more flexible hours of operation and a convenient location.

Access/Convenience. Hulka et al. (1975) examined client satisfaction with medical services. The sample was composed of 1,714 adults from a household survey. These researchers found the areas dissatisfaction with medical services were centered around accessibility, costs, and convenience of health services.

Tessler and Mechanic (1975) examined client satisfaction with pre-paid group practice and fee-for-service. The sample was composed of a pre-paid group (N = 356) and a fee-for-service group (N = 354). These researchers found clients in the pre-paid group had difficulty obtaining an appointment and waited a longer interval before the appointment. Clients in the fee-for-service group reported significantly more dissatisfaction with waiting time in the physician's office than those in the pre-paid group. Clients in the pre-paid group reported greater travel time and inconvenience than the fee-for-service group. They also had to utilize a specific health agency which might be located a longer distance from their home, accounting for the inconvenience of travel time.

Berkanovic and Marcus (1976) studied client satisfaction with health services. The sample consisted of 451 clients who were all Caucasian, receiving Medicaid, and female. The researchers found that the amount of information clients received from the physician, negative perceptions of physician behavior, and difficulty obtaining an appointment were strongly related to client dissatisfaction with health services. Clients who had difficulty obtaining an appointment would delay seeking medical care, even when they recognized the need for care.

Terminating from a particular health plan can be an indicator of dissatisfaction of medical services. Ware and Davies (1983) studied consequences of client dissatisfaction. These researchers found that client satisfaction was a predictor of changing physicians and terminating from pre-paid plans. This relationship was a linear one. These researchers suggest it was a misconception by people in the health field that the majority of clients are either satisfied or very satisfied with their health care.

Pope (1978) examined client satisfaction in a HMO. Data were obtained from surveys of two parallel samples of current and recently terminated subscribers to Kaiser-Permanente pre-paid plan. The surveys were mailed to 2,117 current subscribers and 1,404 terminated subscribers. The response rate for the current group was 65% and for the terminated group 29%. Clients were satisfied with the cost, access, and client-physician relationship. Clients reported dissatisfaction with services when there was a long time between calling for an appointment and the appointment date and when the rules of the organization were inconvenient. Reasons given for terminating services were job changes, moving out of the service area, problems with access, dissatisfaction with quality of care, and impersonal atmosphere.

Osterweis and Howell (1979) conducted a multi-site study examining client satisfaction with ambulatory care. The sample consisted of 204 clients from three study sites. These researchers found that the clients were dissatisfied with access at all sites. Access factors included long waits to see the physician, inconvenient location of the clinic, inconvenient operating hours of the clinic, costs of medical care, and delays in getting appointments. The clients also lacked knowledge about the availability of organizational resources.

Zapka (1979) assessed client satisfaction in a HMO. The sample was composed of 538 clients, with a return rate of 72%. The major problem clients had with the organization was access. Client dissatisfaction with medical services was a result of difficulty making an appointment, clerk discourtesy, and waiting to see the physician.

Fox and Storms (1981) examined factors associated with client satisfaction with medical services. The sample consisted of 2,021 clients, for a return rate of 98%. These researchers found that several components of access related to client satisfaction with services. These components were having a regular place of care, ease of getting an appointment, and having a regular physician.

Greenley and Schoenherr (1981) examined how organizational factors influenced client satisfaction with the human element of medical service. The sample consisted of 411 clients, 417 staff members, and 11 randomly selected agencies. Results indicated that clients had higher levels of satisfaction with medical services when the organization had more autonomy, more interagency communication, positive attitudes toward clients, and an advocacy mechanism. Clients were dissatisfied with services when they encountered delays or rejection when trying to

gain access to health services. Clients were also dissatisfied when they perceived the agency as unhelpful.

Grant (1982) explored client satisfaction within a military setting. The sample consisted of 216 clients. Clients were satisfied that health services were free and physicians were not practicing with for-profit motives. The greatest source of dissatisfaction with services involved long waiting times for medical appointments, pharmacy, and diagnostic tests. Clients were also dissatisfied with parking arrangements and with the process of choosing or keeping a physician.

Zastowny et al. (1983) analyzed their previous research regarding client satisfaction. The combined sample was over 1,000 clients. Their results indicated that fee-for-service clients reported higher satisfaction with service than HMO clients in two areas: making an appointment and the physician's interest in them. The HMO clients were more satisfied with emergency care and short waiting times once they arrived at the clinic.

Hopton et al. (1993) studied client satisfaction with general practice. The sample included 1,599 clients and 43 physicians. They found a major source of client dissatisfaction was waiting too long to be seen by the physician. Furthermore, once clients saw the physician, they felt the physician was in too much of a hurry.

Rubin et al. (1993) examined client ratings of outpatient visits in the medical outcomes study. Clients (N =17,671) were surveyed from several sites across the United States. These researchers reported that access issues were the biggest problem. Clients reported dissatisfaction with office visit waits, calling the office and being put on hold, office location, and not enough time with the physician. Clients from large practice organizations had difficulty gaining access to health services.

Mangelsdorff (1994) and Mangelsdorff et al. (1992) examined attitudes of clients that received care from military outpatient clinics. The total sample size was 8,241, with a usable survey return rate of 29%. Client dissatisfaction with services was centered around trouble obtaining an appointment, long waiting times to see a physician, not having the same provider, problems with telephone access, poor facilities, and living too far away from the treatment facility.

Freeborn and Pope (1994) examined client satisfaction with managed care within the Kaiser Permanente organization. The researchers reported findings similar to other studies related to access. Clients were dissatisfied with the appointment-making process, appointment lag time, and not being able to obtain care without an appointment. They were least satisfied with the amount of time spent on the telephone getting through to the appointment clerks. Satisfaction with access was higher among clients who made more clinic visits, were older, and had a low income. An interesting point related to client satisfaction dealt with "one-stop shopping" or the "mall concept". Clients liked having health services under one roof. They found this convenient and liked having to park only once rather than travel from place to place for health care.

Efficiency. Avis, Bond and Arthur (1995) explored client satisfaction with outpatient services. This exploratory study used a qualitative design to investigate client perceptions about health services. The sample was composed of 81 new clients from two outpatient clinics. The clients were interviewed before and after the first consultation. Of the initial sample, 33 clients were interviewed again at follow-up. Overall, 85% of the clients were satisfied with care and 78% felt their expectations were met. Certain themes emerged from this study regarding the structural aspects of care. Clients felt it was important for staff to be friendly and informative; they were very positive and put at ease when the staff was kind. Clients were most likely to be satisfied when they perceived the setting to be organized; they tolerated waits when they were informed of the delays and the system seemed fair and efficient. Clients were critical when delays were apparently a result of inefficiency, which was often defined as having to come back for more tests or failure to resolve their problem. Another important factor was obtaining "process" information prior to coming to the clinic. Process information consisted of how to get to the clinic, where to park, what to do, and where to go once in the clinic.

Major Findings

Several important variables emerge as they relate to client satisfaction. Sociodemograpahic variables such as age, gender, ethnicity, and educational level are related to client satisfaction (Chaska et al., 1980; Doyle & Ware, 1977; Fox & Storms, 1981; Freeborn & Pope, 1994; Haq, 1993; Hopton et al., 1993; Hulka et al., 1975; Kurata et al., 1992; Linn & Greenfield, 1982; Mangelsdorff, 1994; Pascoe & Attkisson, 1983; Treadway, 1983; Weingarten et al., 1995). Other variables include continuity of care, utilization of health services, clients perception of their health status, client attitudes and expectations regarding health services, and perceived organization of the health agency (DiMatteo et al., 1979; Gonzalves et al., 1995; Grant, 1982; Harris et al., 1997; Linn & Greenfield, 1982; Linn et al., 1985; Thompson & Sunol, 1995; Tessler & Mechanic, 1975; Weingarten et al., 1995; Weiss, 1988).

Several variables related to structure emerge as important determinants of satisfaction. Access issues are the most often reported areas for client dissatisfaction with medical services (Gonzalves et al., 1995; Grant, 1982; Hsieh & Kagle, 1991; Hulka et al., 1975; Mangelsdorff, 1994; Mangelsdorff et al., 1992; Pope, 1978; Rubin et al., 1993; Tessler & Mechanic, 1975; Thompson & Yarnold, 1995; Weinberger et al., 1981; Zapka, 1979). Difficulty making an appointment, lag time between making the appointment and the appointment day, and waiting to see the physician were some of the access problems encountered in many of the studies reviewed. These difficulties seem prominent in all types of clinics, but especially in HMO, university, and military settings.

Major Limitations

A review the client satisfaction research literature reveals inconsistent findings and highlights the lack of focus. There are several reasons for these conceptual and methodological difficulties.

The conceptual problems include inconsistent definitions of client satisfaction, related constructs which are not operationally defined, and a lack of theory/model-based research on client satisfaction variables. Satisfaction is defined as an attitude, an emotion, a cognitive process, and a mixture of all of these components. Satisfaction is both uni-dimensional and multi-dimensional. Satisfaction is not stable across populations, cultures and medical encounters (Aharony & Strasser, 1993; Ware, Davies-Avery, & Stewart, 1978). The client plays a role in the satisfaction process. These contradictory definitions across researchers make it difficult to summarize the body of evidence.

Throughout the literature there are inconsistencies regarding the labeling of related constructs. Researchers utilize constructs in different ways and with different labels, so interpretation can vary depending on how the constructs are used (Aharony & Strasser, 1993; Greenley & Schoenherr, 1981; Ware et al., 1978; Weiss, 1988). Examples of these constructs include the art of care, client expectations, technical quality of care, accessibility/convenience, physical environment, and outcomes of care. The way client satisfaction is characterized as a variable also differs among researchers. Some authors viewed client satisfaction as an end in itself; others as an intermediate process contributing to quality of life or functional ability. Still others view satisfaction as a quality of care indicator.

The last conceptual problem concerns the rarity with which satisfaction theories or models serve as a framework for testing research questions or hypotheses. Only a few studies have had a theoretical foundation (Fox & Storms, 1981; Linder-Peltz, 1982; Tarlov et al., 1989). Replication of studies which test a theory or model are rarely reported in the literature. Satisfaction research has been aimed at trying to solve application problems, instead of building a theory base.

A number of methodological problems exist in the client satisfaction literature. Some of these issues include unreliable client reports/ratings, bias, sampling errors, non-experimental studies, and failure to establish instrument reliability and validity. Perhaps one of the greatest controversies in this area surrounds the reliability of client reports/ratings. Since most of the research is based on client interviews or surveys, client reliability is an important issue. Some experts question the clients' ability to give accurate satisfaction ratings (Aharony & Strasser, 1993; Pascoe, 1983; Susman, 1994; Williams, 1994). Arguments against using client ratings include the client's lack of technical expertise to evaluate medical care, impaired judgment because of emotional or physical status, reluctance to disclose true feelings because of provider/agency retribution, and inaccurate recall of all aspects of the delivery process. Supporters of client

reports argue that: clients do appreciate technical care and can define quality; client outcomes are influenced by client satisfaction; healing may occur as a result of the clients' perception of the medical interaction or the interpersonal aspects of the physician-client relationship; and an association exists between satisfaction and improved compliance and reduced appointment cancellations (Cleary & McNeil, 1988).

Another methodological problem with client satisfaction studies is bias. Very few studies have data on the characteristics of individuals who do not respond to surveys (Chaska et al., 1980; Freeborn & Pope, 1994; Haq, 1993; Kurata et al., 1992; Mangelsdorff, 1994; Mangelsdorff et al., 1992; Zapka, 1979). Thus, it is impossible to evaluate whether these characteristics influence how satisfaction is rated. Another bias concerns the administration, response format, and timing of surveys. The mode of administration of instruments is important and all clients should have the survey administered in the same way. Surveys which use an agree-disagree format may cause an acquiescent response bias. Ross, Steward, and Sinacore (1995) found that clients that were older, less educated, and in poorer health were more likely to be acquiescent responders. However, surveys that use response alternatives can create artificial cutoffs, creating bias. The timing of survey administration is another important consideration. Clients remember less as time increases between their medical visit and the survey.

Sampling difficulty creates another methodological problem. Random sampling may not be appropriate or possible for a study. Convenience samples are often used in satisfaction research (Doyle & Ware, 1977; Grant, 1982; Hopton et al., 1993; Kurata et al., 1992; Zastowny et al., 1983). Some populations may be over-represented or under-represented. Low response rates may also lead to over-representation of some groups i.e., females and Caucasians. Sample sizes tend to be small and representative of only one institution. Many clinics studied are university-affiliated. This type of clinic attracts certain clients and providers who may be different from other clients and providers in the community.

The majority of client satisfaction studies have been descriptive in nature (Freeborn & Pope, 1994; Grant, 1982; Haq, 1993; Hulka et al., 1975; Kurata et al., 1992; Lochman, 1983; Mangelsdorff, 1994; Mangelsdorff et al., 1992; Williams & Calnan, 1991; Zapka, 1979). Only a few studies have been able to manipulate some aspect of outpatient care, such as assigning clients to a particular group to determine the effects on client ratings. Future studies need to control variables like client acuity level, type of clinic, first or recurrent visit, and type of provider seen.

The final problem researchers fail to discuss is the reliability and validity of client satisfaction instruments (Freeborn & Pope, 1994; Grant, 1982; Haq, 1993; Kurata et al., 1992; Ramsey et al., 1993; Treadway, 1983). There has been a lack of standardization regarding the method of measuring client satisfaction. Early instruments were simple, were ad hoc measures

and were designed to be used with an inpatient population. Without instrument reliability data, it is very hard to draw conclusions about the importance of statistically significant relationships. Published findings addressing the validity of client satisfaction instruments are typically found in two areas: evaluation of services and prediction of health and illness behavior. The critical issue which must be addressed is whether measures of specific satisfaction dimensions differentiate between specific characteristics of providers and services. Another concern is whether client satisfaction ratings are influenced by factors outside the health care system, such as attitudes towards the community or personality variables. Client satisfaction measuring and forecasting subsequent health and illness behavior has gained more support in the literature ( Ware et al. 1978; Pascoe, 1983).

## Results

Client satisfaction was measured using a 37-item questionnaire. The questionnaire was administered twice: on the day of the visit to the clinic and six months later. A copy of the questionnaire was provided in Appendix A; an analysis of its reliability and validity was provided in Chapter 9.

### Characteristics of Client Satisfaction Variables

The objective of this portion of the data analysis was to describe the nature of the data collected on client satisfaction. Frequency analysis of items on the client satisfaction questionnaire revealed that the highest ratings of client satisfaction on the day of the visit were achieved on items concerned with the provider's interpersonal behavior and the convenience of the clinic's location and hours (items 3, 4, 25, 27, 28, 34, and 35). At least 75% of clients rated those items "satisfied most of the time" or "always satisfied." The lowest ratings occurred on two items. Only 54% of the clients rated item 10 ("length of time you wait to get an appointment for routine care") "satisfied most of the time" or "always satisfied." Only 59% of the clients rated item 12 ("access to medical care whenever you need it") "satisfied most of the time" or "always satisfied." Six other items were conspicuous because 15% to 20% of clients rated them as "not applicable." These items were concerned with choosing a provider, getting medical care without financial hardship, and getting medical advice by phone (items 11, 14, 15, and 22-24). It is not possible to know from these data whether clients believed these items were "not applicable" in the sense that these clients did not want to choose a provider or in the sense that they believed it was not possible in the military system to exercise choice.

The total score on the client satisfaction questionnaire was used in subsequent analyses. A score above 140 indicated a high degree of satisfaction with the majority of services, while a

score of less than 80 indicated a high degree of dissatisfaction. It is clear from the variability seen in Table 7-1, that the questionnaire was able to discriminate among different degrees of satisfaction. It is also clear from the difference between the mode and the median for each variable that a large group of clients were less than satisfied with health care services and that most clients were only moderately satisfied.

**Table 7-1**

**Characteristics of Client Satisfaction Variables**

| Variable | n | minimum score | maximum score | mode | median | mean | standard deviation |
|---|---|---|---|---|---|---|---|
| Client Satisfaction Day of Visit | 218 | 30 | 185 | 101 | 137 | 134.8 | 30.5 |
| Client Satisfaction Six Months after Visit | 165 | 43 | 185 | 94 | 132 | 129.9 | 33.3 |

Characteristics of Client Samples: Day of Visit vs Six Months

The dataset used to study client satisfaction on the day of the visit included 218 clients. Six months later, 167 of those clients returned follow-up questionnaires. The objective of this portion of the data analysis was to describe differences between the 167 clients who completed the entire study (completion group) and the 51 who completed only the first phase (attrition group). A chi square test of independence was used to determine the statistical significance of differences. A disproportionate number of the attrition group were active duty personnel (39% in the attrition group versus 20% of the completion group), $\chi^2$ (3) = 16.39, $p$ = 0.001, were in the younger age group (35% in the attrition group versus 20% of the completion group), $\chi^2$ (2) = 8.31, $p$ = 0.02, and had an ethnic background other than Caucasian, African-American, or Hispanic (18% in the attrition group versus 8% of the completion group), $\chi^2$ (3) = 8.08, $p$ = 0.04. However, the groups were not significantly different in terms of gender, educational level, income, symptoms, or comorbidity.

Relationship of Clinic Use to Client Satisfaction over Six Months

The frequency with which clients use primary care clinics is confounded with the nature and severity of their health problem(s). Although neither severity of symptoms nor comorbidity was correlated with client satisfaction on the day of the visit ($r$ = 0.08 and 0.02, respectively) or six months later ($r$ = 0.13 and 0.03, respectively), it seemed prudent to analyze the association between clinic use and client satisfaction before conducting extensive analyses of the client satisfaction at six months. The frequency of clinic use was uncorrelated with client satisfaction at six months ($r$ = 0.03).

Clinic Use during the Study Period

The objective of this portion of the data analysis was to identify whether specific subgroups of the sample differed in the degree to which they used the clinics. Clients were divided into four groups on the basis of the number of visits they reported having made during the six month period of the study: one visit (n = 70), two visits (n = 32), three visits (n = 32), and four to ten visits (n = 33). A chi square test of independence was used to determine the statistical significance of differences among beneficiary categories, provider types, and clinic types.

Beneficiary Category. Clients were divided into four groups on the basis of their beneficiary category: active duty service members (n = 24), family of active duty service members (n = 69), retired service members (n = 31), and family of retired service members (n = 43). A 4 x 4 chi square test (Beneficiary Category x Clinic Use Group) revealed no significant differences among the groups.

Provider Type. Clients were divided into three groups on the basis of the type of provider they saw at the beginning of the study: physician (n = 24), nurse practitioner (n = 69), or physician assistant (n = 31). A 3 x 4 chi square test (Provider Type x Clinic Use Group) revealed no significant differences among the groups.

Clinic Type. Clients were divided into three groups on the basis of the type of clinic they were using (see Chapter 9): Type I (n = 52), Type II (n = 62), and Type III (n = 53). A Type I clinic saw predominantly active duty clients in a Troop Medical Clinic setting, but also provided care to family members of active duty personnel. These clinics rarely or never treated retirees or their family members. Type I clinics used a non-physician provider to physician ratio of 2:1. Four of the nine clinics in the study were Type I clinics. A Type II clinic saw family members of active duty personnel, as well as retirees and their family members. Active duty personnel were not seen in these clinics. Three of the nine clinics in the study were Type II clinics. A Type III clinic saw a significant number of clients from each of the four beneficiary categories. Type III clinics used a non-physician provider to physician ratio of 1:2. Two of the nine clinics in the study were Type III clinics. A 3 x 4 chi square test (Clinic Type x Clinic Use Group) revealed no significant differences among the groups.

All of the analyses of the six month follow-up data were based on the assumption that the initial visit with a provider could influence long-term health and satisfaction (via identification of a chronic illness, health education, referral for additional care, referral for specialty care, etc.). However, no attempt was made in this prospective observational study to control the number of visits that clients made to the clinic or the types of providers seen on subsequent visits. Although

that fact should be considered in any interpretation of the six month follow-up data, the previous analyses make it clear that it should not be of great concern in this sample of primary care clients, where 42% of the clients reported that their only visit to the clinic in the last six months was the one in which they were enrolled in the study and an additional 19% made only one other visit to the clinic during the study period.

Intercorrelations of Process and Outcome Variables

The objective of this portion of the data analysis was to quantify the relationship of process variables to each other and to outcome variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 7-2 provides the intercorrelation matrix of these variables. Variables which had intercorrelations of $\pm$ 0.40 or greater are discussed below ( i.e., $r^2 \geq 0.16$, indicating that the shared variance exceeded 15%).

Provider Variables. It is clear from the data in Table 7-2 that there was a good deal of overlap among the practice style variables. In particular, Autonomy and Information Giving were clearly related to each other ($r = 0.44$) and to each of the other practice style variables. Remarkably, there was no evidence of any meaningful simple bivariate linear relationship between any of the practice style variables and any of the client variables. These facts dictated the kind of analyses that could be done of the relationship between practice style variables and client satisfaction.

Client Variables. The intercorrelations of client variables exhibited a predictable pattern. Clients' ratings of the severity of their symptoms at the time of the clinic visit were correlated with functional status on the same day ($r = -0.44$) and clients' ratings of the severity of their co-morbidity at the time of the clinic visit were correlated with functional status a week later ($r = -0.41$).[2] Functional status and health status were highly correlated on the day of the visit ($r = 0.80$), one week later ($r = 0.83$), and six months later ($r = 0.85$). Client satisfaction on the day of the visit was not related to symptom severity, comorbidity severity, functional status, or health status on that day or with functional or health status six months later. Apparently, in these primary care clinics the quality of the interaction with the provider and health care services in general were adequate to meet the needs of the clients, regardless of the severity of their illness or injury. Although this is somewhat surprising given the literature, it is in keeping with the philosophy of care espoused by the military services. All of the other correlations among client variables which

2 The correlation is negative because a high number on the functional status score indicated severe limitations, while a high number on the symptom rating indicated very mild symptoms.

exceeded $\pm$ 0.40 were testimony to the test-retest reliability of the questionnaires (see Chapter 9 for a description of the reliability and validity analysis).

**Legend for Table 7-2**

PM = practice model score

Conf = confidence score

Autn = autonomy score

Coll = collaboration score

IG = information giving score

JS = job satisfaction score

Symp =average rating of severity of symptoms on the day of the clinic visit

Co-m =average rating of severity of co-morbidity on the day of the clinic visit

IS 0 = information seeking score on the day of the clinic visit

FS 0 = functional status score on the day of the clinic visit

HS 0 = health status score on the day of the clinic visit

CS 0 = satisfaction score on the day of the clinic visit

FS 1 = functional status score one week after the clinic visit

HS 1 = health status score one week after the clinic visit

IS 6 = information seeking score six months after the clinic visit

FS 6 = functional status score six months after the clinic visit

HS 6 = health status score six months after the clinic visit

CS 6 = satisfaction score six months after the clinic visit

## Table 7-2

## Intercorrelation Matrix of Process and Outcome Variables

| | | | Provider Variables[a] | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PM | Conf | Autn | Coll | IG | JS |
| Provider Variables[a] | | PM | 1.00 | | | | | |
| | | Conf | 0.40 | 1.00 | | | | |
| | | Autn | 0.33 | 0.48 | 1.00 | | | |
| | | Coll | 0.37 | 0.23 | 0.48 | 1.00 | | |
| | | IG | 0.50 | 0.42 | 0.44 | 0.39 | 1.00 | |
| | | JS | 0.33 | 0.27 | 0.48 | 0.37 | 0.27 | 1.00 |
| Client Variables | Day of Visit[a] | Symp | -0.17 | -0.10 | -0.00 | -0.11 | -0.10 | 0.06 |
| | | Co-m | 0.06 | -0.04 | 0.07 | -0.03 | -0.01 | 0.05 |
| | | IS 0 | -0.03 | -0.02 | -0.09 | -0.06 | 0.02 | -0.05 |
| | | FS 0 | 0.13 | 0.07 | 0.07 | 0.12 | 0.00 | 0.08 |
| | | HS 0 | -0.09 | -0.05 | -0.03 | -0.10 | 0.00 | -0.11 |
| | | CS 0 | -0.14 | -0.07 | -0.14 | -0.13 | -0.08 | -0.03 |
| | One Week[b] | FS 1 | 0.07 | 0.08 | 0.05 | 0.06 | -0.01 | 0.05 |
| | | HS 1 | -0.05 | -0.03 | 0.00 | -0.05 | 0.02 | -0.14 |
| | Six Months[c] | IS 6 | -0.01 | -0.06 | 0.02 | -0.08 | -0.03 | 0.05 |
| | | FS 6 | 0.01 | -0.01 | -0.07 | 0.12 | 0.00 | 0.06 |
| | | HS 6 | 0.01 | -0.03 | 0.08 | -0.07 | 0.04 | -0.04 |
| | | CS 6 | -0.13 | -0.13 | -0.09 | -0.15 | -0.08 | 0.10 |

| | | | Client Variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day of Visit[a] | | | | | | 1 Week[b] | | 6 Months[c] | | | |
| | | | Symp | Co-m | IS 0 | FS 0 | HS 0 | CS 0 | FS 1 | HS 1 | IS 6 | FS 6 | HS 6 | CS 6 |
| Client Variables | Day of Visit[a] | Symp | 1.00 | | | | | | | | | | | |
| | | Co-m | 0.21 | 1.00 | | | | | | | | | | |
| | | IS 0 | -0.01 | -0.12 | 1.00 | | | | | | | | | |
| | | FS 0 | -0.44 | -0.36 | 0.07 | 1.00 | | | | | | | | |
| | | HS 0 | 0.36 | 0.35 | -0.01 | -0.80 | 1.00 | | | | | | | |
| | | CS 0 | 0.08 | 0.02 | 0.09 | -0.19 | 0.07 | 1.00 | | | | | | |
| | One Week[b] | FS 1 | -0.29 | -0.41 | 0.04 | 0.73 | -0.71 | -0.10 | 1.00 | | | | | |
| | | HS 1 | 0.26 | 0.37 | -0.06 | -0.66 | 0.80 | 0.02 | -0.83 | 1.00 | | | | |
| | Six Months[c] | IS 6 | -0.07 | -0.14 | 0.55 | 0.12 | -0.04 | 0.09 | 0.10 | -0.08 | 1.00 | | | |
| | | FS 6 | -0.35 | -0.38 | 0.12 | 0.56 | -0.53 | -0.12 | 0.59 | -0.56 | 0.21 | 1.00 | | |
| | | HS 6 | 0.35 | 0.40 | -0.10 | -0.56 | 0.66 | 0.00 | -0.60 | 0.71 | -0.11 | -0.85 | 1.00 | |
| | | CS 6 | 0.13 | 0.03 | 0.05 | -0.11 | 0.00 | 0.73 | -0.05 | -0.02 | 0.14 | -0.11 | 0.05 | 1.00 |

[a] Sample size = 218.
[b] Sample size = 216.
[c] Sample size ranges from 160 to 167.

Group Differences in Client Satisfaction on the Day of the Visit to the Clinic

The objective of this portion of the data analysis was to identify subgroups of the sample with differing levels of satisfaction on the day of the clinic visit. A series of one way analyses of variance were used to highlight group differences among beneficiary categories, age groups, genders, ethnic groups, educational backgrounds, income groups, symptoms conditions, and comorbid conditions.

Beneficiary Category. Clients were divided into four groups on the basis of their beneficiary category: active duty service members ($n$ = 44, mean = 128.54), family of active duty service members ($n$ = 88, mean = 133.15), retired service members ($n$ = 36, mean = 144.89), and family of retired service members ($n$ = 50, mean = 137.56). There were no significant differences among the groups.

Age Groups. Clients were divided into three groups on the basis of their age (Table 7-3). Groups were significantly different, $F$ (2, 215) = 8.19, $p$ = 0.0004. A priori least squares mean comparisons revealed that clients who were over 50 years old were significantly more satisfied than those who were under 30 ($p$ = 0.006) or who were 30 to 50 years old ( $p$ = 0.0001). Clients who were under 30 were not significantly different from those who were 30 to 50 years old.

**Table 7-3**

**Client Satisfaction by Age Group**

| Age Group | n | mean | standard deviation |
|---|---|---|---|
| under 30 | 51 | 131.84 | 30.96 |
| 30 to 50 | 103 | 128.61 | 28.17 |
| over 50 | 64 | 147.25 | 30.56 |

Genders. Clients were divided into two groups on the basis of their gender: male ($n$ = 55) and female ($n$ = 159). There were no significant differences among the groups (means were 138.35 and 133.75, respectively).

Ethnic Groups. Clients were divided into four groups on the basis of their ethnicity: Hispanic ($n$ = 14, mean = 131.43), African American ($n$ = 37, mean = 134.89), Caucasian American ($n$ = 145, mean = 135.34), and all others ($n$ = 22, mean = 133.59). There were no significant differences among the groups.

Educational Backgrounds. Clients were divided into six groups on the basis of their educational background: less than high school/high school equivalency diploma/completed high school (n = 50, mean = 139.20), some college (n = 57, mean = 136.81), some college with a certificate or license (n = 19, mean = 142.32), two year college degree (n = 23, mean =130.39), four year college degree (n = 47, mean =127.32), and graduate college degree (n = 22, mean = 134.09). There were no significant differences among the groups.

Income Groups. Clients were divided into five groups on the basis of their total annual family income: less than $21,000 (n = 31, mean = 141.29), $21,000 to $40,000 (n = 81, mean = 137.36), $41,000 to $60,000 (n = 46, mean =135.54), $61,000 to $80,000 (n = 28, mean =129.32), and more than $80,000 (n = 21, mean = 123.71). There were no significant differences among the groups.

Number of Symptoms. Clients were divided into four groups on the basis of the number of symptoms they had on the day of the clinic visit: one symptom (n = 132, mean = 138.73), two (n = 39, mean = 130.62), three (n = 27, mean = 129.93), and four or five (n = 20, mean = 124.00). There were no significant differences among the groups.

Types of Symptoms. Clients were divided into nine groups on the basis of the nature of their primary symptom on the day of the clinic visit. The most common reason for the visit was the need for a preventive medicine procedure (such as a pap smear or a prostate exam). The next most common reason was an upper respiratory problem (including cold, flu, sinus infection, asthma, etc.), followed by musculoskeletal problems (pain, swelling, or fracture of any bone, joint, or muscle), back pain, gynecological problems (ranging from sexually transmitted disease to contraception), skin problems (such as rashes or insect bites), gastrointestinal upset (vomiting, diarrhea), and hypertension. The final category included all other problems (such things as cancer, diabetes, tooth pain, etc., each of which occurred in only one or two clients). Groups were not significantly different (Table 7-4).

**Table 7-4**

**Client Satisfaction by Reason for Visit**

| Reason for Visit | n | mean | standard deviation |
|---|---|---|---|
| Preventive Medicine | 56 | 137.66 | 34.14 |
| Upper Respiratory | 40 | 128.45 | 25.27 |
| Musculoskeletal | 29 | 133.17 | 29.74 |
| Back Pain | 15 | 129.13 | 33.83 |
| Skin | 12 | 147.75 | 28.06 |
| Gastrointestinal | 12 | 131.42 | 25.22 |
| Hypertension | 10 | 137.50 | 33.94 |
| Gynecology | 8 | 126.13 | 34.08 |
| Other | 36 | 139.31 | 30.18 |

Number of Comorbid Conditions. Clients were divided into five groups on the basis of the number of comorbid conditions they had on the day of the clinic visit: none ($n$ = 63, mean = 133.40), one ($n$ = 68, mean = 133.92), two ($n$ = 40, mean = 138.80), three ($n$ = 21, mean = 141.29), and four or five ($n$ = 26, mean = 129.46). Groups were not significantly different.

Types of Comorbid Conditions. Clients were divided into six groups on the basis of the nature of their primary comorbid condition on the day of the clinic visit. Almost a third of the clients reported no comorbidity. The most common comorbid condition was hypertension, followed by back pain, musculoskeletal problems, and upper respiratory problems. The final category included all other problems. Groups were significantly different, $F$ (5, 212) = 3.11, $p$ = 0.01 (Table 7-5).

**Table 7-5**

**Client Satisfaction by Comorbidity Category**

| Comorbidity Category | n | mean | standard deviation |
|---|---|---|---|
| No Cormorbidity | 61 | 133.33 | 28.94 |
| Hypertension | 39 | 151.05 | 26.33 |
| Back Pain | 25 | 125.40 | 32.16 |
| Musculoskeletal | 20 | 132.10 | 23.29 |
| Upper Respiratory | 15 | 134.60 | 34.51 |
| Other | 58 | 130.60 | 32.40 |

Clients with hypertension were the most satisfied, while those with back pain were the least satisfied. Table 7-6 shows the results of a priori least squares mean comparisons among all the groups.

**Table 7-6**

**P Values for Comparisons of Client Satisfaction Means**

**by Comorbidity Category**

| Comorbidity Category | None | Hyper-tension | Back Pain | Musc. | Upper Resp. | Other |
|---|---|---|---|---|---|---|
| No Cormorbidity | | .004 | .26 | .87 | .88 | .62 |
| Hypertension | | | .001 | .02 | .07 | .001 |
| Back Pain | | | | .45 | .35 | .47 |
| Musculoskeletal | | | | | .81 | .85 |
| Upper Respiratory | | | | | | .64 |
| Other | | | | | | |

Relationship of Clinic Type to Client Satisfaction on the Day of the Visit

The objective of this portion of the data analysis was to determine whether the type of clinic the client visited influenced the level of satisfaction. Clients were divided into three groups on the basis of the type of clinic that they visited (see page 7-20 for a definition of Clinic Type). A one-way analysis of variance on Clinic Type (levels = I, II, and III) was used to answer this question. Clinic types were not significantly different.

Relationship of Provider Type to Client Satisfaction on the Day of the Visit

The objective of this portion of the data analysis was to determine whether there were fundamental differences among types of providers that would dictate the types of analyses that could be performed on client satisfaction data. A one way analysis of variance on Provider Type (levels = MD, NP, and PA) was used to answer this question. Provider Type was not statistically significant, although the clients of physicians tended to be more satisfied (mean = 139.57), than those of nurse practitioners (mean = 130.17) or physician assistants (mean = 129.74).

Relationship of Provider Practice Style to Client Satisfaction on the Day of the Visit

In keeping with the overall goal of the study, the objective of this portion of the data analysis was to identify the influence of provider type and practice style variables on client satisfaction. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 analysis of variance with one covariate was used to analyze the data. Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was a practice style variable (levels = Low, Medium, and High). These two factors were both between-groups factors. Age of the client was included as a covariate in the model due to its association with client satisfaction. In this way, it was possible to hold constant the effect of age, while assessing whether practice style and type of provider (alone or in combination) influenced client satisfaction.

Practice Model. Providers were divided into three groups on the basis of their total score on the practice model questionnaire: Low scored below 135, Medium scored between 135 and 143, and High scored above 143. There were 76 clients whose providers scored in the Low group, 81 whose providers scored in the Medium group, and 61 whose providers scored in the High group. A 3 x 3 analysis of variance with one covariate (Provider Type x Practice Model, with Age) was used to analyze client satisfaction on the day of the visit. The main effect of Age was significant, $F$ (1, 208) = 4.25, $p$ = 0.04. The main effect of Practice Model was significant and the main effect of Provider Type was marginally significant, $F$ (2, 208) = 3.58, $p$ = 0.03 and $F$ (2, 208) = 2.80, $p$ = 0.06, respectively. However, their interaction was not. Inspection of the adjusted cell means revealed that clients who saw providers who scored low on the practice model questionnaire were more satisfied (mean = 138.88, $p < 0.05$) than those who saw providers who scored medium or high on the practice model questionnaire (mean = 130.62 and 131.23, respectively). When means were adjusted to account for the age of the client and the practice model of the provider, clients who saw physicians tended to be more satisfied (mean = 138.19) than those who saw nurse practitioners or physician assistants (mean = 131.56 and 130.99, respectively).

Confidence. Providers were divided into three groups on the basis of their total score on the confidence questionnaire: Low scored below 194, Medium scored between 194 and 225, and High scored above 225. There were 72 clients whose providers scored in the Low group, 77 whose providers scored in the Medium group, and 69 whose providers scored in the High group. A 3 x 3 analysis of variance with one covariate (Provider Type x Confidence, with Age) was used to analyze client satisfaction on the day of the visit. The main effect of Age was significant, $F$ (1, 208) = 4.48, $p$ = 0.04. The interaction of Provider Type and Confidence was significant, $F$ (4, 208) = 3.23, $p$ = 01. The main effect of Provider Type was marginally significant $F$ (2, 208) = 2.90, $p$ = 0.06. The main effect of Confidence was not significant. Inspection of the adjusted cell means revealed that a single group of clients accounted for the significant effect. When means were adjusted for the age of the client, clients who saw physicians who had moderate scores on the confidence in skills questionnaire were significantly more satisfied, than clients in any other group. Table 7-7 lists these means and the $p$ value for the pairwise comparison of the medium confidence physician group with each of the other groups.

**Table 7-7**

**Comparison of Client Satisfaction across Provider Type by Confidence Groups:**

**P Value for Medium Confidence Physician Group versus All Other Groups**

| Group Provider Type | Practice Model | n | mean | p |
|---|---|---|---|---|
| MD | Low | 42 | 134.41 | 0.003 |
| MD | Medium | 29 | 155.54 | -- |
| MD | High | 39 | 130.15 | 0.0006 |
| NP | Low | 18 | 135.88 | 0.03 |
| NP | Medium | 31 | 127.49 | 0.0004 |
| NP | High | 21 | 130.16 | 0.008 |
| PA | Low | 12 | 129.16 | 0.01 |
| PA | Medium | 17 | 130.07 | 0.005 |
| PA | High | 9 | 134.68 | 0.07 |

Autonomy. Providers were divided into three groups on the basis of their total score on the autonomy questionnaire: Low scored below 110, Medium scored between 110 and 125, and High scored above 125. There were 56 clients whose providers scored in the Low group, 107 whose providers scored in the Medium group, and 55 whose providers scored in the High group. A 3 x 3 analysis of variance with one covariate (Provider Type x Autonomy, with Age) was used to analyze client satisfaction on the day of the visit. The main effect of Age was significant, $F$ (1, 208) = 5.92, $p$ = 0.02. The main effect of Autonomy was not significant. The main effect of Provider Type was marginally significant $F$ (2, 208) = 2.80, $p$ = 0.06. The interaction of Autonomy and Practice Model was not significant. When means were adjusted to account for the age of the client and the autonomy of the provider, clients who saw physicians tended to be more satisfied (mean = 137.65) than those who saw nurse practitioners or physician assistants (mean = 132.90 and 128.99, respectively).

Collaboration. Providers were divided into three groups on the basis of their total score on the collaboration questionnaire: Low scored below 76, Medium scored between 76 and 88, and High scored above 88. There were 68 clients whose providers scored in the Low group, 87 whose providers scored in the Medium group, and 63 whose providers scored in the High group. A 3 x 3 analysis of variance with one covariate (Provider Type x Collaboration, with Age) was used to analyze client satisfaction on the day of the visit. The main effect of Age was significant, $F$ (1, 208) = 4.63, $p$ = 0.03. The main effect of Collaboration was significant and the main effect of Provider Type was marginally significant, $F$ (2, 208) = 3.28, $p$ = 0.04 and $F$ (2, 208) = 2.82, $p$ = 0.06, respectively. However, their interaction was not. Inspection of the adjusted cell means revealed that clients who saw providers who scored low or medium on the collaboration

questionnaire were more satisfied (mean = 137.00 and 136.18, respectively, $p \leq 0.05$) than those who saw providers who scored high on the collaboration questionnaire (mean = 125.27). When means were adjusted to account for the age of the client and the collaboration level of the provider, clients who saw physicians tended to be more satisfied (mean = 137.65) than those who saw nurse practitioners or physician assistants (mean = 131.28 and 129.56, respectively).

Information Giving. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 71 clients whose providers scored in the Low group, 64 whose providers scored in the Medium group, and 83 whose providers scored in the High group. A 3 x 3 analysis of variance with one covariate (Provider Type x Information Giving, with Age) was used to analyze client satisfaction on the day of the visit. The main effect of Age was significant, $F$ (1, 208) = 5.82, $p$ = 0.02. The main effect of Information Giving was not significant. The main effect of Provider Type was marginally significant $F$ (2, 208) = 2.80, $p$ = 0.06. Their interaction was not significant. When means were adjusted to account for the age of the client and the information giving level of the provider, clients who saw physicians tended to be more satisfied (mean = 137.60) than those who saw nurse practitioners or physician assistants (mean = 131.24 and 132.47, respectively).

Job Satisfaction. Providers were divided into three groups on the basis of their total score on the job satisfaction questionnaire. However, physician assistants were not evenly distributed across the three groups; they tended to score low or high, but not in the middle range. Thus, for this analysis, the medium and high groups were combined. Providers were divided into two groups on the basis of their total score on the job satisfaction questionnaire: Low scored below 72, Medium/High scored above 72. There were 67 clients whose providers scored in the Low group and 149 whose providers scored in the High group. A 3 x 2 analysis of variance with one covariate (Provider Type x Job Satisfaction, with Age) was used to analyze client satisfaction on the day of the visit. The main effect of Age was significant, $F$ (1, 211) = 7.95, $p$ = 0.005. The main effect of Job Satisfaction was not significant. The main effect of Provider Type was marginally significant $F$ (2, 208) = 2.79, $p$ = 0.06. Their interaction was not significant. When means were adjusted to account for the age of the client and the job satisfaction level of the provider, clients who saw physicians tended to be more satisfied (mean = 139.39) than those who saw nurse practitioners or physician assistants (mean = 133.90 and 131.27, respectively).

Relationship of Provider Practice Style to Change in Client Satisfaction over Six Months

In keeping with the overall goal of the study, the objective of this portion of the data analysis was to quantify the stability of client satisfaction over time and to identify the association of provider type and practice style variables with change in client satisfaction over time. Results of these analyses must be interpreted with some caution, because no attempt was made in this study to control the number or variety of experiences that clients had with the military health care system during the six months of the study. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 analysis of variance with one covariate was used to analyze the data. Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was a practice style variable (levels = Low, Medium, and High). These two factors were both between-groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit versus Six Months Later). Age of the client was included as a covariate in the model due to its association with client satisfaction. In this way, it was possible to hold constant the effect of age, while assessing whether practice style and type of provider (alone or in combination) were associated with client satisfaction.

Practice Model. Providers were divided into three groups on the basis of their total score on the practice model questionnaire: Low scored below 135, Medium scored between 135 and 143, and High scored above 143. There were 61 clients whose providers scored in the Low group, 62 whose providers scored in the Medium group, and 44 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with one covariate (Provider Type x Practice Model x Time, with Age) was used to analyze change in client satisfaction over six months. The main effect of Age was significant, $F$ (1, 155) = 8.45, $p$ = 0.004, as was the main effect of Time, $F$ (1, 155) = 8.00, $p$ = 0.005. No other main effects or interactions were significant. When age was held constant, client satisfaction declined over the six month period, regardless of the type of provider or the practice model of the provider (mean on the day of the visit = 136.00 and mean six months later = 128.91). Apparently, clients rated services more positively when they were rating a specific visit to the clinic, rather than their general experience.

Confidence. Providers were divided into three groups on the basis of their total score on the confidence questionnaire: Low scored below 194, Medium scored between 194 and 225, and High scored above 225. There were 58 clients whose providers scored in the Low group, 56 whose providers scored in the Medium group, and 53 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with one covariate (Provider Type x Confidence x Time, with Age) was used to analyze change in client satisfaction over six months. The main effect of Age was significant, $F$ (1, 155) = 8.63, $p$ = 0.004, as was the main effect of Time, $F$ (1, 155) = 7.80, $p$ =

0.006. No other main effects or interactions were significant. When age was held constant, client satisfaction declined over the six month period, regardless of the type of provider or the confidence level of the provider.

Autonomy. Providers were divided into three groups on the basis of their total score on the autonomy questionnaire: Low scored below 110, Medium scored between 110 and 125, and High scored above 125. There were 45 clients whose providers scored in the Low group, 79 whose providers scored in the Medium group, and 43 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with one covariate (Provider Type x Autonomy x Time, with Age) was used to analyze change in client satisfaction over six months. The main effect of Age was significant, $F$ (1, 155) = 8.05, $p$ = 0.005, as was the main effect of Time, $F$ (1, 155) = 6.64, $p$ = 0.01. No other main effects or interactions were significant. When age was held constant, client satisfaction declined over the six month period, regardless of the type of provider or the autonomy level of the provider.

Collaboration. Providers were divided into three groups on the basis of their total score on the collaboration questionnaire: Low scored below 76, Medium scored between 76 and 88, and High scored above 88. There were 51 clients whose providers scored in the Low group, 71 whose providers scored in the Medium group, and 45 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with one covariate (Provider Type x Collaboration x Time, with Age) was used to analyze change in client satisfaction over six months. Three main effects were significant: Age, $F$ (1, 155) = 8.29, $p$ = 0.005, Collaboration, $F$ (2, 155) = 3.24, $p$ = 0.04 and Time, $F$ (1, 155) = 8.60, $p$ = 0.004. However, the interaction of Provider Type, Collaboration, and Time was also significant, $F$ (4, 155) = 2.61, 0.04. No other main effects or interactions were significant. Figures 7-1, 7-2, and 7-3 present these adjusted means.

**Figure 7-1**

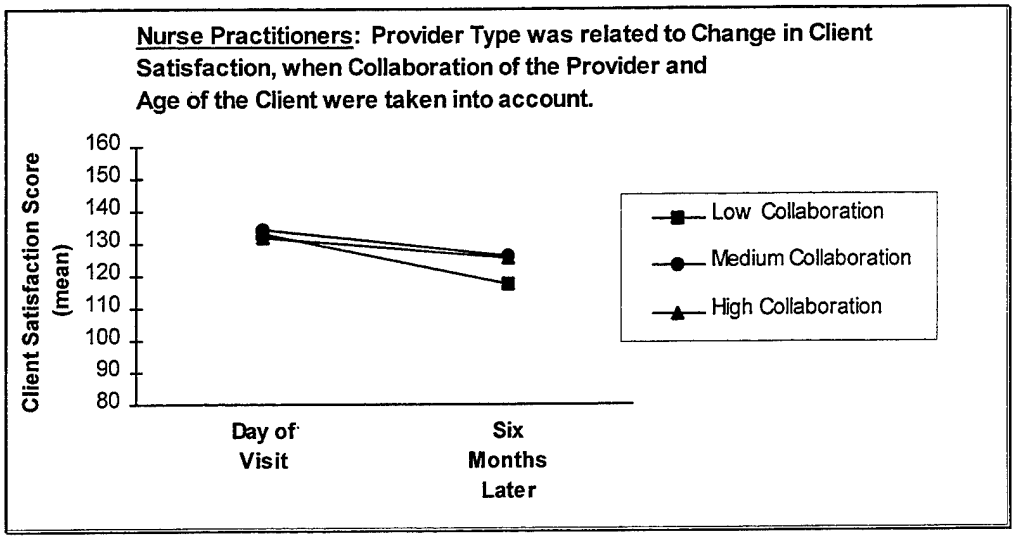
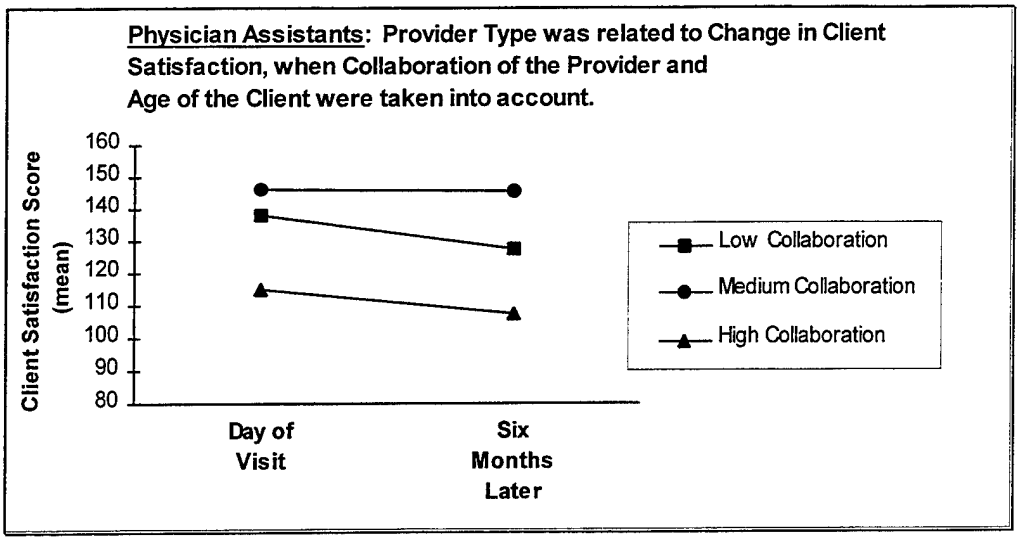



Figure 7-1 clearly shows that the clients of nurse practitioners showed the same level of satisfaction and the same degree of negative change in satisfaction regardless of the provider's level of collaboration (when the scores were adjusted for age of the client).

**Figure 7-2**




However, Figure 7-2 shows a slightly different pattern for physician assistants. Although the pairwise differences were not statistically significant in all cases, clients of physician assistants who scored high on the collaboration questionnaire were less satisfied both on the day of the visit (high PA group $\leq$ medium PA group, $\underline{p} = 0.08$; high PA group $\leq$ low PA group, $\underline{p} = 0.21$) and six months later (high PA group < medium PA group, $\underline{p} = 0.05$; high PA group $\leq$ low PA group, $\underline{p} = 0.28$). Furthermore, clients of physician assistants who scored high on the collaboration questionnaire showed a decline in satisfaction over the six month period. Clients of physician assistants who scored low on the collaboration questionnaire also showed a decline in satisfaction over the six month period, while clients of physician assistants who scored in the medium range on the collaboration questionnaire did not.

**Figure 7-3**

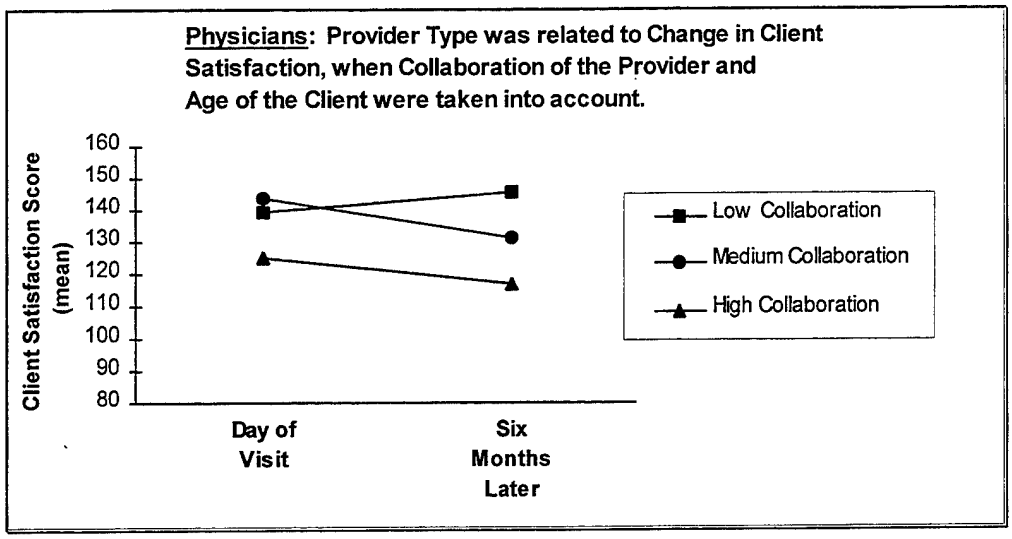



Figure 7-3 shows the pattern for physicians. Although the pairwise differences were not statistically significant in all cases, clients of physicians who scored high on the collaboration questionnaire were less satisfied both on the day of the visit (high MD group < medium MD group, $p = 0.02$; high MD group $\leq$ low MD group, $p = 0.10$) and six months later (high MD group $\leq$ medium MD group, $p = 0.08$; high MD group < low MD group, $p = 0.002$). Furthermore, clients of physicians who scored high on the collaboration questionnaire showed a decline in satisfaction over the six month period. This pattern matched that of physician assistants. However, the pattern of results for the clients of physicians in the low and medium groups was the opposite of that seen with clients of physician assistants in the low and medium groups. That is, the clients of physicians in the low collaboration group actually showed an improvement in satisfaction over the six month period and the clients of physicians in the medium collaboration group showed a decline.

Information Giving. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 53 clients whose providers scored in the Low group, 52 whose providers scored in the Medium group, and 62 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with one covariate (Provider Type x Information Giving x Time, with Age) was used to analyze change in client satisfaction over six months. The main effect of Age was significant, $F(1, 155) = 8.76$, $p = 0.004$, as was the main effect of Time, $F(1, 155) = 8.10$, $p = 0.005$. No other main effects or interactions were significant. When age was held constant, client satisfaction declined over the six month period, regardless of the type of provider or the information giving level of the provider.

Job Satisfaction. Providers were divided into three groups on the basis of their total score on the job satisfaction questionnaire. However, physician assistants were not evenly distributed across the three groups; they tended to score low or high, but not in the middle range. Thus, for this analysis, the medium and high groups were combined. Providers were divided into two groups on the basis of their total score on the job satisfaction questionnaire: Low scored below 72, Medium/High scored above 72. There were 50 clients whose providers scored in the Low group and 117 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with one covariate (Provider Type x Job Satisfaction x Time, with Age) was used to analyze change in client satisfaction over six months. The main effect of Age was significant, $F$ (1, 158) = 10.51, $p$ = 0.001, as was the main effect of Time, $F$ (1, 158) = 8.35, $p$ = 0.004. No other main effects or interactions were significant. When age was held constant, client satisfaction declined over the six month period, regardless of the type of provider or the job satisfaction level of the provider.

## Conclusions

(1) The majority of clients were only moderately satisfied with health care services.

(2) The highest ratings of client satisfaction occurred on items concerned with the provider's interpersonal behavior. The lowest ratings occurred on items concerned with choice and access.

(3) Congruent with the results of previous research, client satisfaction was highest in clients over 50 years old.

(4) In contrast to the results of previous research, there were no significant differences in client satisfaction scores for different beneficiary categories, genders, ethnic groups, educational levels, income groups, or levels of severity of illness/injury. Nor was there a significant difference between clinic types or frequent vs infrequent users of the clinics.

(5) There was no significant difference in the level of satisfaction among clients who saw physicians, nurse practitioners, or physician assistants.

(6) However, when data were controlled for age of the client and the practice style of the provider, the clients seeing physicians tended to be more satisfied than those seeing nurse practitioners or physician assistants. This was especially true when the physician scored in the moderate range on the confidence questionnaire, rather than either low or high.

(7) Clients who saw providers who scored low on the practice model questionnaire were more satisfied than those who saw providers who scored in either the medium or high range. This was true regardless of whether the provider was a physician, nurse practitioner, or physician assistant.

(8) Clients who saw providers who scored high on the collaboration questionnaire were less satisfied than those who saw providers who scored in either the low or high range. This was true regardless of whether the provider was a physician, nurse practitioner, or physician assistant.

(9) When data were controlled for age of the client and the practice style of the provider, client satisfaction declined over the six month period of the study. This was true regardless of whether the provider was a physician, nurse practitioner, or physician assistant. Apparently, clients rated services more positively when they were rating a specific visit to the clinic, rather than their general experience.

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# CHAPTER 8
# CLIENT HEALTH OUTCOMES

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## Introduction

The goal of any health care system is to optimize the health of its members. In an effort to achieve this goal, physicians, nurse practitioners, and physician assistants manage care provision and, thus, determine allocation and management of health care resources. Those efforts toward optimizing health are just beginning to be quantified. Measuring health outcomes will assist in determining appropriateness and effectiveness of therapeutic interventions (Breslow, 1989; Caper, 1988). The purpose of this study was to determine the impact of provider practice style on client health status and functional status outcomes.

The World Health Organization defines health as a "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (Aday, 1994, p. 489). The goal is not perfect health, but optimal health, where the cost of any further improvement exceeds the value of the improvement. Optimal health depends on the perception of the desirability of the change and the inherent sacrifices to achieve the gain. As such, health is a subjective concept that is multi-dimensional (Bailit, Federico, & McGivney, 1995; Cohen & Henderson, 1988).

Diseases are, in part, created by societies which shape the ways that illnesses are experienced. Culture and nature combine to create the varieties of disease that a society or community experiences. Inequalities in health often reflect existing social inequalities (Link & Phelan, 1996). Access, quality of care, education, and income levels, and personal habits and beliefs are just a few of the factors that create inequalities in health.

The United States spends considerably more on health care per capita than any of the other industrialized nations, and, yet, health status indicators place the nation in the bottom half of these same countries (Anderson, Alonso, Kohn, & Black, 1994). In an effort to improve health status, health care policy must involve the influence of social forces, regulations, and outcome research findings. Social forces include those economic, market, social, and political factors that influence resource allocation and use. Existing regulations include the adherence to current laws and rules. Outcomes research examines the clinical and social sequelae of health care. The most promising force in health care reform is that of outcomes research (Benjamin, Perfetto, & Greene, 1995).

If the health care system is to become more effective and affordable, what works and its cost must be defined. It has been concluded that 80% of modern medical treatments have no scientific basis (Goldberg & Cummings, 1994). National agencies, such as the Agency for Health Care Policy and Research and the Joint Commission on the Accreditation of Healthcare Organizations, are endorsing the measurement of patient outcomes. They are developing practice guidelines and quantitative measures of outcomes in an effort to determine the

appropriateness and effectiveness of medical interventions (Jennings, 1993). Health care systems in the future will be distinguished by price and outcomes (Arford & Allred, 1995; Bailit et al., 1995).

Since the concept of health is multidimensional, it follows that the measurement of health must be as well. To be accurate and meaningful, evaluation of health must be comprehensive, multidisciplinary, and multidimensional. And to fully understand the significance of health as a client outcome, its structure and process antecedents must be examined (Jennings, 1993; Mark, 1995).

## Health Outcome Measurement

Quality of life, health status, and functional status are measurements of health that are used interchangeably in the literature, but lack definitions or comprehensive conceptualization (Bergner, 1989). Coupled with the multidimensional nature of health, it is no wonder that health outcome measurement is a difficult process.

Hegyvary (1991) and Williamson (1978) suggested that the type of measurement, timing, level of analysis, and complexity must all be considered. Numerous types of outcome measurements may be appropriate in any given clinical situation. In fact, different perspectives and priorities of treatment outcomes may lead a provider to focus more on the health status dimension of a treatment, whereas a client might focus on functional improvements. The value of the outcome is established by precisely defining the outcome, establishing what the outcome is, and determining the purpose and the beneficiary of the outcome. The introduction of client preferences implies that no preconceived idea of the objectives of care will fit any given client (Donabedian, 1988; Lohr, Yordy, & Thier, 1988).

Given the complexity of outcomes, the timing of the measurement is critical. Repeated measures designs which assess health as a continuous process are most appropriate. Many outcomes are naturally delayed and are not easy to obtain (Donabedian, 1988; Gonnella, Cattani, Louis, McCord, & Spirka, 1977; Lohr, 1988). One way to resolve this difficulty is to examine health care outcomes for an episode of health care. This is the period of time during which a specific disease process, illness, health care problem, or treatment process is present. Health care episodes can then be further broken down into disease, illness, health maintenance, and care episodes. Because episodes have distinct starting and stopping points, the issue of timing is partially resolved (Hornbrook, Hurtado, & Johnson, 1985).

The level of analysis also needs consideration. The appropriate level is determined by the population measured. The effects of a specific treatment on an individual or the quality of the entire health care system on the health of the population are two examples. The level of analysis

also includes the proximal-distal continuum model in health outcome measurement. The more proximal outcomes would be clinical signs and symptoms, whereas the distal outcomes would include mobility, role performance, and life satisfaction (Brenner, Curbow, & Legro, 1995; Deyo & Patrick, 1989).

The objectives of health care are improvements in current health and in future prospects of health and improvement in the attitudes, knowledge, and behavior that are conducive to health (Donabedian, 1984 & 1986). However, it must be realized that any outcome can be attributed to many independent variables since every part of human existence is related to health. The simplistic application of isolated interventions to outcomes is inappropriate when evaluating health outcomes (Greenfield, 1990; Hegyvary, 1991; Horwitz & Horwitz, 1993; Williamson, 1978). When outcomes are poorly linked to clinical processes, they offer little in the way of improving the quality of care. More definitive evidence of process and outcome linkages and improvement in health status measures' reliability and validity is required (Lohr, 1988).

Wilson and Kaplan (1995) feel that the ability to measure health outcomes does not necessarily imply the ability to treat, manage, or improve such outcomes. Donabedian (1992) states that outcomes don't directly assess the quality of performance. He feels that they only permit an inference about the quality of the process and structure of care provision.

In addition to methodologic difficulties in outcome measurement, barriers to the use of health status measurement exist. Deyo and Patrick (1989) describe some of those behaviors as attitudinal and knowledge barriers, conceptual barriers, methodologic barriers, and practical barriers. Client attitudes that espouse functional ability as the most important outcome of medical care contradict providers' priorities of physiologic measures. Functional disabililty is often not disease-specific. A related attitude is the perception that subjective information is too "soft" to draw definitive clinical, research, or policy conclusions. Conceptually, there is a failure to distinguish the various purposes of the questionnaire. Questionnaires can be used to discriminate among subjects at a single time, to predict some future outcome, or to measure changes over time. Methodologic issues include the wide array of existing instruments available, the choice of disease-specific vs generic health status measures, the lack of a "gold standard" measure for assessing validity, and the uncertainty of the generalizability of the instrument. Finally, the most critical practical barrier to measuring health status is the sheer burden of lengthy questionnaires.

## Evolution of Health Status Measurement

The re-emergence of the notions of health and health status are revivals of ancient Greek and Chinese concepts. Internal equilibrium and a balance of forces acting on and within the body were basic concepts of health. The biomedical revolution of the 19$^{th}$ century replaced those

ancient notions with a more mechanistic viewpoint of disease and their pathogeneses. Health became the absence of disease. This viewpoint is now recognized as incomplete (McHorney & Tarlov, 1995). Today, health includes an expectation of longevity, free of disease and impairment. Emphasis has been re-focused on health as a balanced state; disease is not the only issue, nor is the absence of disease the only goal (Breslow, 1989).

Dimensions of health status include five elements: the genetic foundation that forms the basic structure upon which all other aspects of health must build; the biochemical, physiologic, and anatomic condition; the functional condition, which includes performance of activities of daily living; the mental condition, which includes self-perception, mood, and emotion; and the health potential, which includes longevity, prognosis, and disability (Bergner, 1985).

The American College of Physicians lists the benefits of health status measurement. These include the detection, quantification, and identification of the sources of decreased functional capacity, the guidance of management decisions, efficient use of resources, improvement of the prediction of the disease course, and improvement of client outcomes of symptoms, mortality, satisfaction with care, function, and quality of life (Wasson et al., 1992b). But, it has yet to be determined how much improvement in health status is considered clinically significant (Bailit et al., 1995; Bergner, 1989).

Three approaches to measuring health status exist. The first type of measurement uses self-perception of health. This measurement is entirely subjective and, usually, global in nature (Breslow, 1989). Skepticism about self-reporting is based on several factors, one of which is that these measures lean strongly toward positive results. This positivity phenomenon creates a bias in measurement (Campbell, Converse, & Rodgers, 1976). The second approach consists of objective physical or psychological tests. The third approach is to determine the competence for social functioning which permits the judgment of role performance. This is sometimes termed "functional assessment".

## Literature Review

### Self-Perceptions of Health

Self-perceptions of health are affected by psychological distress, which contributes to bodily symptoms and demand on the health care system. Altered psychological states affect bodily processes and the occurrence of disease. Such factors also condition the ways in which people define health and illness, respond to symptoms, and utilize the health care system. "However much physicians may wish to reserve the process of medical care for those entities they conceive of as illness, it is the client's conception of health and disease and their experiences

in the community that determine the way the medical care system comes to be utilized" (Mechanic, 1978, p. 26).

Researchers have been skeptical about self-perceptions of health. As a result, a great deal of research is available indicating that clients adequately assess their health status and are able to predict their mortality better than clinicians.

Gaitz and Scott (1972) collected data from a sample of 1,441 clients residing in Houston to determine age related differences in mental health. Results indicated that a majority of the sample reported being in "pretty good" or "very good" health. Sixteen percent of the clients reported health that was "not good" or "poor". Responses were provided by the middle and older age groups. When gender and skill levels were controlled, the relationship between aging and poor health remained. Self-appraisals were significantly correlated with health, happiness, and satisfaction.

Martini and McDowell (1976) asked clients at a rehabilitation center to assess their functional abilities at admission and again at discharge. Interviews were conducted with 758 clients. Results revealed that self-assessments by clients correlated with the results of physical examinations and assessments for capacity for specific body movements by center personnel. The highest correlations were found in areas that related directly to physical movements, dressing, and hygiene. It was concluded that self-assessments of health status were a reliable alternative to judgments made by trained assessors.

Garrity, Somes, and Marx (1978) collected data on 314 college students at two points in time, three months apart. Results revealed that psycho-physiological symptoms were the strongest correlate of health perception. Illness experience, life change, and perceived stress levels were also moderately correlated with health perception. Gender and socioeconomic status were unrelated to perceived health.

Blazer and Houpt (1979) surveyed 977 healthy community adults aged 65 or older. A one-in-ten stratified random sample of the residents of Durham County was drawn. Eighty five percent of the sample responded to the interviewer-administered questionnaire. Results indicated that 719 of the sample were not impaired physically. Of these 719, 104 (14%) perceived their health status to be poor, while 615 (86%) perceived it to be unimpaired. Those physically healthy adults that perceived their health to be poor were more depressed, more hypochrondriacal, and more dissatisfied with life. They also showed greater economic impairment.

Fillenbaum (1979) compared the self-assessments of health to objective measures of health (number of problems, different medicines used, number of diagnoses) with randomly selected mentally capable older persons in the community ($\underline{N} = 61$). Information was obtained from a 10% random sample of community residents aged 65 and over and a 20% stratified

random sample of residents aged 65 and over in institutions in the same community. Results revealed that self-assessments made by community residents related to objective health measures. There were gender-related differences; women had a poorer objectively assessed health status for a given self-assessment of health than men.

LaRue, Bank, Jarvik, and Hetland (1979) examined the relationship between self-reports of health and physicians' ratings, and assessed how both measures related to longevity. Survivors of a sample of elderly twins (N = 69) that had been part of an initial sample of 268 twins selected between 1947 and 1949 were studied. Results indicated that self-reports of health were significantly correlated with ratings assigned by the physician on the basis of medical records. Both measures were predictive of five-year survival among the younger sample (84.25 years or younger), but neither was significantly related to longevity for the older sample (over 84.25 years). There were no reported gender differences. The authors concluded that "health identity" may not only affect, mood, and cognitive functioning, but may also determine continued participation in important social roles.

Mossey and Shapiro (1982) utilized data from the Manitoba Longitudinal Study on Aging to test the hypothesis that self-rated health is a predictor of mortality independent of objective health status. A random sample of non-institutionalized residents of Manitoba, Canada aged 65 and over (N = 3,128) completed a survey of a single item measure of self-rated health. A baseline measurement of health status was obtained from physicians and health service utilization data. Analyses revealed that the risk of early mortality (within three years) and late mortality (within six years) for persons whose self-rated health was poor was 2.92 and 2.77 times that of those whose self-rated health was excellent. Objective health status, age, gender, life satisfaction, income, and urban/rural residence were controlled. Among those variables studied, self-rated health was second only to age in its ability to predict early mortality and was the strongest predictor of late mortality. The authors had several possible explanations for these results. First, self-rated health may reflect prescient understanding of subtle biologic and physiologic changes that only the individual can assess. Second, maintenance of preventive health habits may lead clients to have a more positive view of their health than objective measurements might reveal. Third, positive health ratings may be protective. And, lastly, once the objective health status effect was removed from the self-ratings, the residual may be determined purely by the person's emotional status.

Kaplan and Camacho (1983) assessed the association between perceived health ratings ("excellent," "good," "fair," and "poor") and mortality using the Human Population Laboratory survey of a random sample of 6,928 adults in Alameda County, California in 1965 and nine years later. The analyses revealed a significant association between perceived health and mortality. For those respondents over 29 years of age, poor perceptions of health were associated with increased mortality rates.

Goldstein, Siegel, and Boyer (1984) used panel data from the Los Angeles Health Survey to examine variables associated with changes in perceived health status over a one-year period. A major interest was to determine which variables predicted changes in self-rated health. Seven telephone interviews, one every six to eight weeks, and a final face-to-face interview followed the initial interview of 903 subjects. Findings indicated that perceived health status was associated with variations in chronic illness, disability, and utilization of health services. It was concluded that single item measures of perceived health status might reflect only an individual's view of chronic illness. Acute illnesses did not have the expected negative impact on perceived health status.

Kaplan, Barrell, and Lusky (1988) examined the relationship between the subjective state of health and five-year survival in an elderly population of Kiryat Ono, Israel. A total of 1,078 subjects, aged 65 and older, were interviewed. They provided self-evaluations of health. After controlling for age, gender, continent of origin, number of conditions and medications, heart disease, and activities of daily living, self-rating of health was an independent predictor of survival. The amount of drugs taken was strongly related to the self-rating of health. The multiplicity of complaints and medications were strongly related to subjective health, and it appeared that the number of complaints was more important than the type of complaint in predicting subjective health.

Epstein, Hall, Tognetti, Son, and Conant (1989) assessed proxy responses about health status when subjects were unable to respond. The authors compared the responses of 60 subject and proxy pairs, measuring overall current health, functional status, social activity, emotional health, and satisfaction with health care. The subjects were persons over age 65 that received their care at the Harvard University Health Services. Of the 160 subjects contacted, 100 declined, for a 38% response rate. Results indicated that there was a strong correlation between subject and proxy responses on overall health, functional status, social activity, and emotional health, and satisfaction. However, proxies reported lower emotional health and satisfaction than did the subjects. This study was limited by its low response rate, small sample for testing subgroup effects, and lack of generalizability to other settings.

Hall, Epstein, and McNeil (1989) examined 590 elderly members of a Health Maintenance Organization. Results indicated that client ratings of their overall physical and mental health were related to functional, physiological, and emotional factors. Physician ratings of overall physical and mental health were never related to the emotional component. The authors concluded that clients might have a broader frame of reference than physicians when rating their health.

Idler and Angel (1990) tested the ability of self-rated health status to predict mortality with the data from the National Health and Nutrition Examination Survey Epidemiologic Follow-Up Study consisting of adult respondents aged 25 to 74 years ($\underline{N}$ = 6,440). A comprehensive physical examination at the initial interview and survival status at follow-up 12 years later were

available for analysis. Results indicated that self-rated health at time one was associated with mortality over the study period for middle-aged males, but not among elderly males or females of any age. However, in both men and women, self-assessed health remained a strong predictor of survival, even when the diagnoses were controlled. The authors concluded that socio-demographic characteristics, health risk behaviors, and medical diagnoses explained the ability of self-rated health to predict mortality.

Idler, Kasl, and Lemke (1990) tested the ability of global self-evaluations to predict survival rates in two samples of elderly, non-institutionalized adults. The association between self-evaluated global health status (excellent, good, fair, poor) and survival status four years later was investigated. Subjects from the Yale Health and Aging Project, New Haven, Connecticut (N = 2,012) and subjects from the 65+ Rural Health Study, Iowa and Washington counties, Iowa (N = 3,673) provided the data. Face-to-face baseline interviews were conducted. Measures of physical health and functioning, socio-demographic characteristics, health practices, blood pressures, and prescription and non-prescription medication usage were collected. Results revealed that self-perceptions of health status was associated with an increase in the risk of mortality. The authors concluded that self-appraisal of health was a sensitive and significant predictor of mortality even when the prior physical health status of the subject was considered.

Idler and Kasl (1991) re-examined the data from the Yale Health and Aging Project (N = 2,812) in an attempt to control for the contribution of numerous indicators of health problems, disability, and risk factors, and to make adjustments to standard errors of the complex sample design. Results were similar to their earlier study and revealed that poor and fair self-rated health predicted early and late deaths equally well for both males and females. Health perceptions of these subjects appeared to have an enduring impact on the risk of mortality. They concluded that health professionals might wish to take seriously the expressions of subjective health status, especially those made by elderly people.

Krause and Jay (1994) used a single item question and asked respondents to rate their overall health as excellent, good, fair, or poor. In-depth interviews were conducted on a convenience sample of people residing in three cities located in southeast Michigan (N = 158). Several commonly used health measures were evaluated. Results revealed that some respondents think about specific health problems when asked to rate their health, whereas others think in terms of general health behaviors. These referents varied with age. Education and race also created variance in referent use. The authors concluded that global self-rated health tended to reflect those health problems that were important to the client. The fact that the subjects were not selected at random and that confounding factors were not controlled limited the generalizability of the study.

Bayley, London, Grunkemeier, and Lansky (1995) compared the results from the Medical Outcomes Study Short Form 36 Health Status Survey and clinical scoring systems with client self-ratings of success. Clients with total knee replacements (N = 128) or total hip replacements (N = 211) constituted the client sample for the study. Orthopedic surgeons (20) in eight clinics in a community hospital system provided the data for the clinical scoring. Results indicated that clients measured success by post-treatment physical function and somatic pain. Success was related less to the change from their pre-treatment function. Thus, even some low-functioning clients felt their surgery was successful. There was a relationship between the client's rating and the physician's clinical score.

Physical Aspects of Health Status

Starfield and Scheff (1972) assessed the adequacy of various steps in the process of care for children newly diagnosed with anemia in two university hospital clinics. Outpatient reports in the pediatric hematology laboratory files with hemoglobin readings under 10 gm/100 ml of blood were collected. Subjects were children six months and older with newly found anemia. Half of the eligible children were randomly selected for the study (N = 53). Results revealed that the intervention most closely associated with a good outcome of care was therapy. Only 14 of the 53 low hemoglobin values were recognized, diagnosed, treated, and followed-up. A major difficulty was locating and auditing medical records.

Romm, Hulka, and Mayo (1976) related components of care with client outcomes. Adults treated for congestive heart failure were studied (N = 122). The subjects met the following conditions: they were between 50 and 75 years old and were not suffering from psychosis, mental retardation, severe confusion, or any condition that would interfere with answering questions. The diagnosis of congestive heart failure was based on clinical criteria, but was not validated. Subjects with diagnoses in addition to congestive heart failure were included in the sample. The physician sample included 70 internists and family physicians randomly chosen from the medical society roster of practicing physicians in Fort Wayne, Indiana. Of the 70 contacted, 45 agreed to participate in the study. Data included initial client interviews, medical record review, and a follow-up client interview six months after the initial visit. Also, at six months, data were collected on laboratory, x-ray, physician, and hospital utilization. Results indicated that a significant predictor of outcome status was the initial measure of disease status. Satisfaction was an additional significant predictor of activity. The authors concluded that process measures played relatively little role in predicting health status. An interesting finding was that the doctor-client relationship for clients with less symptomatology related positively to outcome.

Pozen, et al. (1977) studied the effect of supplementing routine physician/nursing care with a nurse rehabilitator on the return to work rate of clients with acute myocardial infarction.

This prospective, randomized, controlled trial was conducted on 102 clients during 16 months in the coronary care units of the Baltimore City Hospitals (n = 36 high risk study, 34 high risk control, 19 low risk study, and 13 low risk control). Results indicated that there were no differences between the study and control groups in terms of weight control, knowledge of medications, or anxiety. However, the study group demonstrated an increase in the return-to-work rate and decreased rates of smoking.

Nelson, et al. (1983) conducted a cross-sectional study of functional status (physical and mental) of adults utilizing primary care practices. Clients (N = 1,227) rated their own health status before seeing the physician. Forty seven physicians in 28 different practices rated their respective client's health status at the end of the visit. Results indicated that 12% of the clients rated their physical limitations as major and 8% rated their mental limitations as major. This compares to the physician's ratings of 5% and 4%, respectively. These differences in ratings were statistically significant and were considered to be clinically relevant. Clients' functional limitations were related to increased utilization of ambulatory care, older age, lower level of education, unemployment, and chronic conditions as the primary diagnoses. Visits and charges increased as functional limitations increased. The "no physical limitation" group averaged 3.3 visits and $78 in office charges per year, whereas, the "large to extreme limitation" group averaged 7.3 visits and $253 in office charges. Interestingly, similar findings were reported for emotional ratings.

Croog, et al. (1986) conducted a multicenter, randomized, double-blind clinical trial to determine the effects of anti-hypertensive drugs on quality of life. Caucasian men between the ages of 21 and 65 years of age, employed full time, and with a primary diagnosis of uncomplicated essential hypertension were the subjects in this study (N = 626). A placebo period of one month was followed by a six-month period in which clients received anti-hypertensive agents. Each client was randomly assigned to receive one of the three drugs (captopril, methyldopa, and propranolol). Evaluations of clients were conducted at two-week intervals during the placebo period and monthly during the medication period. Quality of life interviews were conducted at the beginning and end of the placebo period, and eight and 24 weeks into the medication period. Results indicated that at the end of the 24-week treatment period, all clients had similar blood-pressure control, sleep dysfunction, visual memory, and social participation. Significantly higher measures of general well-being, side effects, work performance, visual-motor functioning, and life satisfaction were found in clients taking captropril vs those clients taking methyldopa. The authors concluded that the effects of anti-hypertensives on quality of life vary and can be easily measured.

Rubenstein et al. (1989) conducted a study to determine if physicians improved their clients' outcomes when they used a 34-item functional status tool. Clients with functional disabilities who saw their physicians at least four times a year completed diaries to record the

number of medications used, visits to the physician or other health professionals, medical equipment purchased, diet, or exercise programs (N = 510, for a 37% response rate). Internal medicine faculty from the University of California, Los Angeles practicing in community offices volunteered for the study (N = 76, for a 28% response rate). Physicians assigned to the treatment group attended a two-hour training session about functional status measurements. Physicians in the control group did not receive the training. Clients' functional status was tested every four months for one year. Results indicated that there were no significant differences in the functional status of the treatment and control groups, despite the fact that one-third of the physicians stated that they had changed their client management based on the results of the functional status reports. Also, there was no evidence that the physicians increased their use of non-physician health specialists, exercise, mental health consultation, physical therapy, or other modalities of treatment.

Again, in 1995, Rubenstein et al. attempted to improve the functional status of primary care clients by providing a computer-generated report of the client's functional status, the client's self-reported chief complaint, and problem-specific resource and management suggestions to the physicians in an experimental group. Physicians in this group also received a half-hour training session and a similar booster session three months later. Physicians in the control group did not receive the report or education. In this study, subjects were internal medicine house officers (N = 73) and their new clients in a university primary care clinic (N = 557). A total of 190 of 309 clients (61% response rate) in the experimental group and 152 of 248 clients (61% response rate) in the control group completed the baseline and post-intervention measurements of physical, psychological, and social function. Results indicated that clients of the experimental group demonstrated significant improvement in their emotional well-being scores. The experimental physician group diagnosed stress or anxiety more often and took more action suggested by the printout. The intervention did not result in overall functional status improvements.

Verbrugge and Balaban (1989) studied 165 hospitalized clients aged 55 and over with a principle admission of hip fracture, cerebrovascular accident, diabetes, arthritis, chronic obstructive pulmonary disease, or congestive heart failure diagnosed for a minimum of one year (up to two years). Within this time frame, each client had nine separate contacts for assessment of cognitive, physical, social, and emotional function. Clients also kept a diary continuously for one year. The diary data (self-reported health and activity level) were analyzed in this report. Results indicated that health was worst and activity levels lowest, gains smallest and declines largest, for elderly men (ages 75 and over) , and for unmarried people, especially men.

Stewart et al. (1989) evaluated the functioning and well-being of 9,385 adult clients (a 50% random sample of eligible clients) in the Medical Outcomes Study at the time of visit to 362 physicians in three different U.S. cities. Results indicated that for eight of the nine common

chronic medical conditions, clients demonstrated markedly worse physical, role, and social functioning, mental health, health perceptions, and/or bodily pain than those clients with no chronic conditions. The greatest impact on the health outcomes was seen with heart disease and gastrointestinal disorders and the least impact was seen with hypertension. Also, clients with more than one chronic condition reported greater decrements in functioning than those clients with only one chronic condition. The authors concluded that no matter which chronic condition a client has, it has adverse affects on functioning and well-being.

A second report of the Medical Outcomes Study by Kravitz et al. (1992) examined the relationship of the mix of clients in different medical specialties, organizations of health care, and utilization. Results indicated that among clients with chronic illnesses (diabetes, hypertension, recent myocardial infarction, or congestive heart failure), severity was associated with decreased functional status and increased hospitalizations, physician use, and number of prescription drugs. They also found that solo practice/single specialty group-fee-for-service clients reported the highest burden of illness and the pre-paid clients the least.

Another report of the Medical Outcomes Study by Greenfield, Rogers, Mangotich, Carney, and Tarlov (1995) compared the outcomes of hypertensive and non-insulin dependent diabetics who were cared for in three different systems of care by generalist and sub-specialist physicians. Results indicated that no one system of care or physician specialty achieved consistently better overall outcomes or lower mortality rates for this sample. The only physician specialty that achieved better outcomes were endocrinologists, who appeared to achieve better foot-ulcer and infection outcomes for clients with diabetes, especially when compared with family practitioners.

Calkins et al. (1991) assessed the ability of internists to identify functional disabilities reported by their clients. They compared responses by physicians and their clients to a 12-item questionnaire about physical and social function. The subjects included five staff physicians, three general internal medicine fellows, and 34 internal medicine residents working in a hospital-based internal medicine group practice in Boston, Massachusetts and in office-based internal medicine practices in Los Angeles, California. The Boston sample consisted of 175 clients (94% response rate) and the Los Angeles sample consisted of 230 clients (61% response rate). The clients were selected at random from those who visited their physician at least twice in the preceding 12 months. Up to eight clients per physician from the hospital-based practice and up to five clients per physician from the office-based practice were surveyed. Clients were asked if they had any difficulty during the previous month performing 12 specific physical and social activities. Clients in Boston were interviewed by phone and those in Los Angeles completed self-administered questionnaires. Physicians completed a self-administered questionnaire with identical questions. Results indicated that physicians under-estimated or failed to recognize 66%

of the disabilities reported by their clients. This failure to recognize or under-estimate occurred more frequently in the hospital-based practice than in the office-based practice. Physicians over-estimated functional disability in 21% of the cases where clients reported none. There was considerable disagreement between clients and physicians in the assessment of functional status.

Wasson et al. (1992a) tested the short-term effects of health assessment on the process of care and client satisfaction. From a list of 63 clinicians, 56 completed the study. Forty one were internists and 15 were nurse practitioners or physician assistants. Research assistants asked 20 to 30 clients per clinician to complete the questionnaires about function, health, reason for visit, and satisfaction with care after the clinic visit. The 29 clinicians in the experimental group received a scripted 10-minute face-to-face instructional session about management of client functional problems. An article about the measurement of function was also provided. The 27 control clinicians did not receive the intervention. Within three weeks of the intervention, the same client data were collected again on 20 to 30 clients per clinician. Results indicated that clinicians in the experimental group ordered more tests and procedures than clinicians in the control group, but only for female clients. Female clients of clinicians in the experimental group reported no change in satisfaction with their care, but male clients reported that the clinician helped in the management of pain. The fact that the population was basically young and healthy and functional assessment was determined only at a single visit before and after the intervention limit the generalizability of these findings.

Albrecht and Nelson (1993) reported findings from a study of 633 working adults employed at one of six participating medium-to-large midwestern corporations. Four structural variables (demographic, psychologic status, social status, and economic status), two modifying variables (access and cost), and three process variables (preventive care and client/family involvement) were studied to determine their relationship with health status outcomes (client perception of health, amount of exercise, body mass index, and percent body fat). Results revealed that both the modifying and process variables were important in predicting health outcomes.

Behmer, Hoffman, and Freeman (1993) compared health risk appraisal age, chronological age, risk factors, physiological measures, and demographic variables with Physical Readiness Test results of 100 active duty Navy personnel. Data from a convenience sample of 100 officer and enlisted personnel (80% of the eligible sample) were used in the analysis. They reported that there was not a strong correlation between Physical Readiness Test scores and physiologic indicators of health status.

Cleary, et al. (1993) assessed the association among healthcare delivery systems, functional impairment, and global health assessments made of persons infected with human immunodeficiency virus (HIV). The three separate study sites were an academic group practice

based at a private teaching hospital, a specialized ambulatory care clinic at a public teaching hospital, and a health maintenance organization. The care provided at these three sites represented the care given to more than 20% of those infected in the state of Massachusetts. The sample of 189 clients (65% response rate) completed measures of life satisfaction, general health perception, physical functioning, emotional well-being and fatigue, disability, pain, memory problems, symptoms, and illness severity. Results indicated that fatigue, functional status, and average severity of all symptoms predicted overall perceived health status. Emotional well-being and perceived health status strongly predicted life satisfaction.

Hays et al. (1994) studied the association between adherence to medical recommendations and health outcomes. Observations were made of 2,125 adult clients with chronic medical diseases or depression over a four-year period. During a telephone interview conducted shortly before entry into the study, clients were asked if their physician had recommended each of 15 specific behaviors. The clients completed a questionnaire three to four months later that asked about the extent to which they had performed those behaviors during the past four weeks. Results indicated that adherence was associated only minimally with improvement in health outcomes. Of the 132 comparisons, only 11 showed statistically significant positive effects of adherence on improvements in health outcomes. There were design limitations. Adherence was difficult to measure because the intensity of physician recommendations varied widely. Also, many factors influence outcomes, besides adherence to treatment recommendations.

Spertus, Winder, Dewhurst, Deyo, and Fihn (1994) compared the sensitivity of the Seattle Angina Questionnaire, a disease specific measure for coronary artery disease with the Short-Form 36, a generic measure of health status used in the Medical Outcomes Study. Clients ($\underline{n}$ = 130) with stable coronary artery disease and clients ($\underline{n}$ = 45) undergoing coronary angioplasty completed both questionnaires at two sessions three months apart. Results indicated that mean scores changed significantly and appropriately on the Seattle Angina Questionnaire, but did not on the Short Form-36. The Short Form-36 was unable to detect subtle changes in the health condition of the client. The authors concluded that a generic health measure might not be sensitive enough to capture important clinical changes in specific disease conditions.

Street, Gold, and McDowell (1994) sought to identify clients' preferences for physician inquiry into the various aspects of health status and to determine whether the availability of health status data would influence the physician's conduct during the visit. Over a four-month period of time, 67 pregnant women were invited to participate in the study and 58 enrolled. Seven resident physicians volunteered. This controlled trial included an experimental group (31 visits) in which the physician received health status information before the visit and a control group (27 visits) that did not. Results indicated that clients preferred that physicians ask about the client's perception of

health and the physical dimensions of health such as pain, energy, and functional limitations. They were also more satisfied when the physicians asked about health status. Clients varied greatly in their preferences for physician inquiry into psycho-social matters such as social functioning, mental health, and emotional problems. Finally, the availability of health status information had little effect on the degree to which physicians asked about the client's health status.

Parkerson, Broadhead, and Tse (1995) attempted to predict health outcomes using two measures of health status and severity of illness as indicators of client case mix. A convenience sample of 413 adult ambulatory clients in a rural primary care community clinic completed the Duke Health Profile. Their providers completed the Duke Severity of Illness Checklist. On the day of the visit, clients completed questionnaires while in the clinic. Immediately after the visit, providers completed the severity of illness measure. Two separate medical audits were conducted. Results indicated that during the 18-month follow-up study, there were five major outcomes: at least one follow-up visit (74.3%), more than six visits (20.6%), a minimum of one referral or hospital admission (17.3%), upper tertile severity scores (24.9%), and upper tertile office charges (24.9%). Baseline measures of physical health, perceived health, and severity of illness scores predicted all five outcomes. The authors concluded that health status and severity of illness measures predicted utilization, cost, and severity of illness in a primary care setting.

Schor, Lerner, and Malspeis (1995) conducted a cross-sectional national survey of adults to obtain estimates of (a) the frequency with which physicians inquired about clients' functional and emotional health status, (b) clients' attitudes about such assessments, and (c) the perceived use of the data in therapeutic management of patient problems. Heads of households ($\underline{N}$ = 2,909), 18 years and older, drawn from a stratified, multi-stage area probability sample in the United States were surveyed. A final sample of 2,474 (77.1% response rate) was included in the analysis. Respondents completed a survey about health status and three aspects of their medical care: the frequency with which their physician assessed functional performance and emotional well-being, whether they believed their physician considered their functional and/or emotional status when making management decisions, and their own attitudes toward physician inquiries regarding these aspects of their health. Results indicated that older (> 65 years old) and chronically ill clients were asked about the effects of their health on physical activities more than younger, not chronically ill, clients. In all cases, social consequences of health had a low rate of inquiry. The majority of physicians rarely or never asked clients about the impact of health on their activities of daily living (64.7% to 78.7%). Nor did they inquire about limitations caused by emotional problems (71.4% to 84.4%). The lack of inquiry persists, despite the fact that 60% of the clients wanted their physicians to assess these aspects of health.

Psychological Aspects of Health Status

Palmore and Luikart (1972) analyzed health, activity, social-psychological, and socio-economic variables that were thought to influence life satisfaction in middle age. The data consisted of measurements of 502 persons aged 45-69 years as part of the Duke Adaptation Study. Each subject was studied every other year for one full day by an interdisciplinary team. Self-rated health was the most significant predictor of life satisfaction. It was followed by the amount of organizational activity and belief in internal control. Age, gender, total social contacts, career anchorage, marital status, and intelligence had little or no relationship to life satisfaction. The authors also reported that the person's own perception of health was a better predictor than the physician's rating of health.

Garrity (1973) tested a theory from social gerontology which proposes that social involvement influences morale. White males who had experienced their first myocardial infarction and survived at least six months after their hospital discharge were included in the sample (N = 62, an 88% return rate). Three hospitals in Durham, North Carolina provided the sample for the study: one was a university hospital, the second was a veterans' hospital, the third was a private community hospital. Data were collected six months after the heart attack using a mailed questionnaire measuring work involvement, participation in community organizations, sociability with relatives and friends, and activeness in leisure pursuit measures. Three measures of health status were included. An audit of hospital records was completed for clinical data that included assessments of chronic health problems and the severity of the initial heart attack. Results indicated that the perception of health was the strongest correlate of morale level. Employment and involvement in leisure activities was significantly related to morale level. Health perceptions did not correlate with either of the clinical measures collected from hospital records. A more diverse population and an evaluation of the values of the clients would have strengthened the results of this study.

McCrae, Bartone, and Costa (1976) collected data on 472 males ranging in age from 25 to 82 and divided them into anxious and adjusted groups based on the analysis of the Cattell 16PF test. Scores on self-reported health were compared. Results revealed that anxious men reported more symptoms than the adjusted men in the young and middle age groups. There was no difference in the older age group. According to records of physician examinations, anxiety was not related to health status. The authors concluded that although health clearly declines with age, self-reports might not reflect this.

Tessler and Mechanic (1978) studied the association between psychological distress and a person's perception of well-being. Four diverse data sets were examined, controlling for

physical health status and socio-demographic variables. Despite the variations in the populations studied, results indicated that distress was negatively correlated with perceived health status.

Aneshensel, Frerichs, and Huba (1984) sought to demonstrate a relationship between physical illness and psychological distress. Adults (N = 744) were interviewed four times over a period of one year. The initial and final interviews were conducted in person, while the second and third interviews were conducted by telephone. Results suggested that socioeconomic status, age, and gender were associated with physical illness and depression. Illness was associated with increasing depressive symptomatology. Depression was followed by increased levels of physical illness approximately four months later. The authors concluded that depression and physical illness were self-perpetuating and mutually reinforcing.

Lichtenberg, Skehan, and Swensen (1984) examined the role of personality, life stress, and osteoarthritic severity in accounting for pain in 40 subjects with an average age of 70 years. Results revealed that personality (hypochondriasis) was the most powerful predictor of pain as compared to stress or osteoarthritic severity. Subjective pain was lower among older clients, despite the fact that the severity of their arthritis was greater.

Lichtenberg, Swensen, and Skehan (1986) conducted a similar study as described above on 70 subjects with an average age of 68 years and found similar results. Hypochondriasis most highly predicted pain for clients with arthritis. Arthritic severity predicted 13% of the pain variance, whereas, psychological measurements accounted for 41% of the pain variance.

Burgess et al. (1987) conducted a controlled randomized trial to test whether psychosocial rehabilitation of acute myocardial infarction clients would improve their return-to-work rate. Clients were assigned randomly to participate in the experimental cardiac rehabilitation program (n = 89) or in the usual hospital rehabilitation (n = 91). Results revealed that at the three month interview, the treatment group was significantly less distressed and less dependent on family support than the control group. In the final follow-up interview at 13 months, there was only a small difference in favor of the experimental group in the frequency of the reported deterrents to return-to-work. Overall, the intervention did not result in a significant difference in the return to work rate between the two groups. Return-to-work rate was most influenced by the client's initial cardiac status and clinical course, the patterns of family support, and by several variables that measured the obstacles to work resumption.

German, et al. (1987) conducted a randomized clinical trial in a primary care setting to test the ability of feedback about the results of a screening instrument to increase awareness in clinicians of the emotional and psychological problems of their clients. Random samples were taken from each day's appointment list over a four-month period. Clients who agreed to participate (N = 1,242, an 81% response rate) completed the General Health Questionnaire and a brief client questionnaire. Of the 1,242 subjects, 488 had "positive" scores, indicating a degree of

psychological or emotional problems, and were randomly assigned to three different study groups. The remaining 754 of the 1,242 subjects had "negative" scores: 433 were eliminated from the study and 321 were randomly assigned to two study groups. The clinicians completed a report form, noting whether the client had an emotional problem, the diagnostic process, and management activities ordered. One week after the enrollment visit, interviewers made home visits to the subjects to complete the in-person interview and a questionnaire. Clients were followed for six months. A clinician report form was completed at each visit. Results indicated that the detection and management of mental morbidity were significantly lower for older individuals (41.3%) than younger clients (57.4%). Feedback intervention increased the likelihood of attention to these problems. Also, feedback increased the degree of agreement between the clinician and client about the client's emotional problem.

Mechanic and Hansell (1987) analyzed data from 1,057 adolescents in 19 public schools from five communities in New Jersey to determine predictors of self-assessments of physical health. Results revealed that competence in several areas of adolescent life and psychological well-being, not physical symptoms, influenced self-assessments of health. After controlling for initial self-assessments, subjects who reported higher levels of scholastic achievement and involvement in sports rated their health better over the one-year period than those reporting lower scholastic achievement and involvement in sports. Also, those adolescents who were initially less depressed assessed their health status more positively.

Connelly, Philbrick, Smith, Kaiser, and Wymer (1989) conducted a study to determine the influence of primary care clients' health perceptions on their utilization of health care services. The study was completed at a rural internal medicine teaching practice staffed by three full-time faculty members and second-year medical residents of the Division of General Internal Medicine, University of Virginia. Over a one month period, 208 consecutive office clients (86% response rate) completed the General Health Perceptions Questionnaire while waiting for their appointment. After the visit, the provider completed a separate questionnaire about the client without the information from the client's questionnaire. Utilization was measured by the number of office visits, number of telephone calls to the physician, and ambulatory charges for twelve months after completion of the questionnaires. Results indicated that the 62 (30%) subjects with low health perception scores experienced more anxiety, depression, health-related worry, and felt less able to resist illness. They also made more office visits, more telephone calls to the physician, and had more office charges than those subjects with higher health perception scores. Physicians accurately predicted the clients' self-perceptions of health in 49% of the cases. The authors concluded that clients with low health perceptions accounted for 5% of the office visits. This is important, especially when compared to the most common disease treated, hypertension, which

accounts for 9% of office visits. These results may be limited by the physician's measure of the client's health and the absence of standardized measures for depression and anxiety.

Wells et al. (1989) reported on another aspect of the Medical Outcomes Study. Data from 11,242 outpatients from three health care provision systems in the United States were utilized in this analysis to determine the relationship between functional status and well-being in two groups of clients, one with chronic conditions and one with no chronic conditions. Results indicated that clients with a current depressive disorder or depressive symptoms tended to have worse health, greater pain, and worse physical, social, and role functioning than those clients without chronic conditions.

Barsky, Cleary, and Klerman (1992) examined the relative contributions made by medical morbidity, psychiatric disorder, functional status, and hypochrondriacal attitudes with clients' opinions of their health status. The study was conducted in the general medicine clinic of the Massachusetts General Hospital. A sample of the most hypochrondriacal clients and a comparison sample of the remainder of the clients were studied. This yielded a sample of 88 hypochrondriacal clients (67.7% response rate) and 100 clients in the comparison sample (53.5% response rate). Results indicated that hypochondriasis, somatization, and disability correlated with global health status ratings. Medical chart and physician ratings correlated with global ratings of health, but morbidity did not explain any additional variance in perceived health status. Somatization, hypochondriasis and functional status also predicted satisfaction with care. The greater the somatization and worsening functional status, the lower the satisfaction scores.

Parkerson, Broadhead, and Tse (1992) measured the quality of life and functional health in a convenience sample of 314 ambulatory adult clients (95.2% response rate) in a rural primary care community health clinic in Yanceyville, North Carolina. Two family physicians, two general internists, and one physician assistant provided medical care. The clients completed measurements of functional health, physical health, anxiety, quality of life, family and non-family support, stress, and financial stress. Providers completed data on the severity of illness and quality of life of each client. Results indicated that the quality of life and functional health were better for clients with low severity who required no confinement to home because of health problems. Severity of illness was the strongest predictor of client-reported functional status and provider-assessed quality of life. Client-assessed and provider-assessed quality of life was not related. Family stress was the strongest predictor of mental health, social health, general health, self-esteem, anxiety, and depression.

Hays, Wells, Sherbourne, Rogers, and Spritzer (1995) conducted a two-year observational study of 1,790 outpatients with depression, diabetes, hypertension, recent myocardial infarction, and/or congestive heart failure. The objective was to determine if there were differences in functional status and well-being between depressed clients and clients with

chronic illnesses. After controlling for comorbidity, socio-demographics, system, and specialty care, results revealed that depressed clients had substantially greater and longer-lasting decrements in functional status and well-being than those clients with chronic illnesses. The authors questioned whether the time of a symptomatic office visit was the opportune time to measure health status and whether depressed clients realistically report their physical limitations. Selection bias limits the ability to draw inferences about process and outcome links in this study.

Demographic Aspects of Health Status

Freeborn, Pope, Davis, and Mullooly (1988) attempted to determine the relationship among health status, socioeconomic status, and utilization of medical services. They found that family income, occupational ranking, and perceived social class predicted health status. Improved health status correlated with fewer total contacts with the health care system, even after controlling for socioeconomic status. However, preventive service utilization was more related to education, social class, and income, than to the measures of health status.

Fein (1995) summarized American and British studies that examined the relationship between social class and health status. After conducting a systematic review of the pertinent literature, he reported that social class, whether measured by occupation, income, or education, had a marked effect on morbidity and mortality. It was suggested that material and social deprivation were the most important factors contributing to negative health outcomes.

Satisfaction and Health Status

Linn and Greenfield (1982) tested the hypothesis that a significant amount of variance in client satisfaction with provider behavior would be explained by clients' current self-assessment of their health and social circumstances. A sample of 519 clients (65% response rate) from three medical subspecialty clinics (arthritis, cardiology, and endocrinology) and a large general medical clinic at the University of California in Los Angeles were studied. Measurements of client satisfaction (art of care, technical quality, and efficacy) and health status (disability days, general health, physical abilities and limitations, social health, and depression) were completed by phone interview or a mailed questionnaire. Results indicated that clients were less satisfied if they spent more days in bed during the past month, if they were more depressed and rated their general health as poorer, and if they reported more physical limitations. The measure of general health explained more of the variance in satisfaction ratings than the physical and mental health measures.

Patrick, Scrivens, and Charlton (1983) examined how disability was associated with dissatisfaction with medical care services provided by primary care physicians. A sample of 726 disabled and 274 non-disabled persons who were between 16 and 74 years of age and living at

home were surveyed using client satisfaction and disability measures. Results indicated that health status, psychosocial disability in particular, was important in the assessment of satisfaction with the various aspects of health care delivery. Disability was not associated with negative evaluation of physicians in general. The main area of dissatisfaction for disabled and non-disabled clients was the amount of health information they had received.

Hall, Feldstein, Fretwell, Rowe, and Epstein (1990) examined the relationship between older clients' satisfaction with medical care and their health status. Health Maintenance Organization clients aged 70 and older (N = 532) comprised the sample. Satisfaction with medical care was examined in relation to health status (self-reports, chart data, and physician ratings), socio-demographics, and characteristics of their primary physicians. Results suggested that satisfaction was significantly related to improvements in self-rated health and physical function, less emotional distress, and more social activity. Physicians' health ratings, the number of diagnoses, and the client's cognitive functioning were not related to satisfaction with medical care. Controlling for socio-demographic characteristics did not alter the relationship between health status and satisfaction. Satisfaction differed significantly among physicians, and neither gender, nor experience accounted for this variation. The authors were unable to determine whether better health leads to greater satisfaction or greater satisfaction leads to better health status.

Hall, Milburn, and Epstein (1993) attempted to determine which came first: satisfaction or health status. Older clients in a Health Maintenance Organization were interviewed at baseline (N = 590) and then one year later (N = 526) about their satisfaction with medical care and their health status. Using structural equation modeling procedures, results indicated that earlier self-perceptions of health and functional status predicted later levels of satisfaction. There was no evidence that the reverse was true; satisfaction did not lead to later health. The variable that was most predictive of later satisfaction was overall self-perceived health. Thus, it was not the mere fact of disability or disease that created the dissatisfaction, but a more global perspective of health, to include psychological experiences of ill health.

Kind and Dolan (1995) hypothesized that respondents with present or past experience with illness give valuations to health status that were difference from those respondents without illness experience. The data used for this analysis came from several studies conducted by the Measurement and Valuation of Health Group at the Centre for Health Economics, University of York, England. Results suggested that past illness experience had no systematic effect on health status, whereas, current experience altered the valuations of health states.

Major Findings

There is a relationship between aging and poor health (Gaitz & Scott, 1972; Krause & Jay, 1994; Verbrugge & Balaban, 1989). Illness experience, life changes, and perceived stress

levels also correlate with self-measurements of health (Aneshensel et al., 1984; Burgess et al., 1987; Garrity et al., 1978; Goldstein et al., 1984; Kind & Nolan, 1995; Lichtenberg et al., 1984; McCrae et al., 1976; Parkerson et al., 1992; Stewart et al., 1989; Tessler & Mechanic, 1978). Chronic illness, severity, and disability variations influence health status measurements, but acute illnesses did not have the expected negative impact on the subjective state of health (Cleary et al., 1993; Goldstein et al., 1984; Kravitz et al., 1992). Health status measurements predicted outcomes in terms of utilization and cost (Connelly et al., 1989; Parkerson et al., 1995).

Self-appraisals of health are as accurate or more accurate than appraisals made by health care providers (Bayley et al., 1995; Blazer & Houpt, 1979; Calkins et al., 1991; Fillenbaum, 1979; Hall et al., 1989; LaRue et al., 1979; Martini & McDowell, 1976; Mossey & Shapiro, 1982; Nelson et al., 1983). Self-appraisals of health also effectively predict mortality (Idler & Angel, 1990; Idler et al., 1990; Idler & Kasl, 1991; Kaplan & Camacho, 1983; Kaplan et al., 1988).

Even though clients prefer that providers ask about their perception of health status (Schor et al., 1995; Street et al., 1994), when the functional status of the client was used prior to an office visit, there remained no significant differences in functional outcomes (Rubenstein et al., 1989; Rubenstein et al., 1995). Client satisfaction is also related to health status (Hall et al., 1990; Hall et al., 1993; Linn & Greenfield, 1982; Palmore & Luikart, 1972; Patrick et al., 1983).

Major Limitations

The current literature is useful, but it lacks in volume. This is not surprising due to the infancy of health status measurement.

## Results

Client health outcomes were measured in two ways. The first measure was a simple illustrated nine-item functional status questionnaire; the second was a more complex 36-item health status questionnaire. Copies of these questionnaires are provided in Appendix A; an analysis of their reliability and validity is provided in Chapter 9. Each of the questionnaires was administered three times: on the day of a visit to the clinic, one week later, and six months later. This presentation of the results is divided into three sections, an introductory section that provides descriptive statistics on the client health outcome variables, a second section that describes analyses of group differences on the functional status variables on the day of the visit, one week later, and six months later, and a final section that describes analyses of group differences on the health status variables on the day of the visit, one week later, and six months later.

## Characterization of Client Health Outcomes

### Characteristics of Client Health Variables

The objective of this portion of the data analysis was to describe the nature of the data collected on client health outcomes. A low score on the functional status questionnaire (8 to 12) indicated excellent health, while a high score (36 to 40) indicated poor health. Scores on the health status score had the opposite meaning. A low score on the health status questionnaire (31 to 46) indicated poor health, while a high score (140 to 155) indicated excellent health. It is clear from the variability seen in Table 8-1, that both the functional status and health status measures were able to discriminate among different degrees of health and were sensitive to changes in health over time. It is also clear from the difference between the mode and the mean for each variable that the majority of clients were quite healthy (low functional status scores and high health status scores), but that a few clients were quite sick.

**Table 8-1**

**Characteristics of Client Health Variables**

| Variable | n | minimum score | maximum score | mode | median | mean | standard deviation |
|---|---|---|---|---|---|---|---|
| Functional Status Day of Visit | 218 | 8 | 36 | 20 | 19 | 19.5 | 6.3 |
| Functional Status One Week after Visit | 216 | 8 | 35 | 12 | 16 | 17.5 | 6.0 |
| Functional Status Six Months after Visit | 167 | 7 | 33 | 12 | 16 | 17.2 | 6.0 |
| Health Status Day of Visit | 218 | 49 | 148 | 139 | 124 | 118.1 | 22.8 |
| Health Status One Week after Visit | 216 | 53 | 151 | 139 | 130 | 122.5 | 22.4 |
| Health Status Six Months after Visit | 167 | 61 | 150 | 139 | 130 | 122.7 | 20.1 |

### Characteristics of Client Samples: Day of Visit vs Six Months

The dataset used to study functional and health status on the day of a visit to a primary care provider included 218 clients. Six months later, 167 of those clients returned follow-up questionnaires. The objective of this portion of the data analysis was to describe differences among the 167 clients who completed the entire study (completion group) and the 51 who completed only the first phase (attrition group). A chi square test of independence was used to determine the statistical significance of differences. A disproportionate number of the attrition group were active duty personnel (39% in the attrition group vs 20% of the completion group), $c^2$ (3) = 16.39, $p$ = 0.001, were in the younger age group (35% in the attrition group vs 20% of the

completion group), $c^2$ (2) = 8.31, p = 0.02, and had an ethnic background other than Caucasian, African-American, or Hispanic (18% in the attrition group vs 8% of the completion group), $c^2$ (3) = 8.08, p = 0.04. However, the groups were not significantly different in terms of gender, educational level, income, symptoms, or comorbidity.

Clinic Use During the Study Period

The objective of this portion of the data analysis was to identify whether specific subgroups of the sample differed in the degree to which they used the clinics. Clients were divided into four groups on the basis of the number of visits they reported having made during the six month period of the study: one visit (n = 70), two visits (n = 32), three visits (n = 32), and four to ten visits (n = 33). A chi square test of independence was used to determine the statistical significance of differences among beneficiary categories, provider types, and clinic types.

Beneficiary Category. Clients were divided into four groups on the basis of their beneficiary category: active duty service members (n = 24), family of active duty service members (n = 69), retired service members (n = 31), and family of retired service members (n = 43). A 4 x 4 chi square test (Beneficiary Category x Clinic Use Group) revealed no significant differences among the groups.

Provider Type. Clients were divided into three groups on the basis of the type of provider they saw at the beginning of the study: physician (n = 24), nurse practitioner (n = 69), or physician assistant (n = 31). A 3 x 4 chi square test (Provider Type x Clinic Use Group) revealed no significant differences among the groups.

Clinic Type. Clients were divided into three groups on the basis of the type of clinic they were using (see Chapter 9): Type I (n = 52), Type II (n = 62), and Type III (n = 53). A Type I clinic saw predominantly active duty clients in a Troop Medical Clinic setting, but also provided care to family members of active duty personnel. These clinics rarely or never treated retirees or their family members. Type I clinics used a non-physician provider to physician ratio of 2:1. Four of the nine clinics in the study were Type I clinics. A Type II clinic saw family members of active duty personnel, as well as retirees and their family members. Active duty personnel were not seen in these clinics. Three of the nine clinics in the study were Type II clinics. A Type III clinic saw a significant number of clients from each of the four beneficiary categories. Type III clinics used a non-physician provider to physician ratio of 1:2. Two of the nine clinics in the study were Type III clinics. A 3 x 4 chi square test (Clinic Type x Clinic Use Group) revealed no significant differences among the groups.

All of the analyses of the six month follow-up data were based on the assumption that the initial visit with a provider could influence long-term health (via identification of a chronic illness, health education, referral for additional care, referral for specialty care, etc.). However, no attempt was made in this prospective observational study to control the number of visits that clients made to the clinic or the types of providers seen on subsequent visits. Although that fact should be considered in any interpretation of the six month follow-up data, the previous analyses make it clear that it should not be of great concern in this sample of primary care clients, where 42% of the clients reported that their only visit to the clinic in the last six months was the one in which they were enrolled in the study and an additional 19% made only one other visit to the clinic during the study period.

Intercorrelations of Process and Outcome Variables

The objective of this portion of the data analysis was to quantify the relationship of process variables to each other and to outcome variables. Pearson correlations were used to identify the degree to which variables were related in a simple linear fashion. Table 8-2 provides the intercorrelation matrix of these variables. Variables which had intercorrelations of $\pm$ 0.40 or greater are discussed below ( i.e., $r^2 \geq 0.16$, indicating that the shared variance exceeded 15%).

Provider Variables. It is clear from the data in Table 8-2 that there was a good deal of overlap among the practice style variables. In particular, Autonomy and Information Giving were clearly related to each other ($r = 0.44$) and to each of the other practice style variables. Remarkably, there was no evidence of any meaningful simple bivariate linear relationship between any of the practice style variables and any of the client variables. These facts dictated the kind of analyses that could be done of the relationship between practice style variables and client health variables.

Client Variables. The intercorrelations of client variables exhibited a predictable pattern. Clients' ratings of the severity of their symptoms at the time of the clinic visit were correlated with functional status on the same day ($r = -0.44$) and clients' ratings of the severity of their co-morbidity at the time of the clinic visit were correlated with functional status a week later ($r = -0.41$).[1] Functional status and health status were highly correlated on the day of the visit ($r = 0.80$), one week later ($r = 0.83$), and six months later ($r = 0.85$). All of the other correlations among client

[1] The correlation is negative because a high number on the functional status score indicated poor functional status, while a high number on the symptom rating indicated mild symptoms.

variables which exceeded $\pm$ 0.40 were testimony to the test-retest reliability of the questionnaires (see Chapter 9 for a description of the analysis).

Close inspection of the data revealed that clients' ratings of the severity of their symptoms at the time of the clinic visit were not highly correlated with their ratings of the severity of their comorbidity at the time of the visit ($r$ = 0.21). This finding suggests that clients distinguished between their acute and chronic conditions. Equally interesting was the fact that neither client satisfaction nor information seeking was highly correlated with symptom severity or comorbidity at the time of the visit or with functional or health status at the time of the clinic visit, one week later, or six months later. Apparently, in these primary care clinics the quality of the interaction with the provider and health care services in general were adequate to meet the needs of the clients, regardless of the severity of their illness or injury.

**Legend for Table 8-2**

PM = practice model score
Conf = confidence score
Autn = autonomy score
Coll = collaboration score
IG = information giving score
JS = job satisfaction score
Symp = average rating of severity of symptoms on the day of the clinic visit
Co-m = average rating of severity of co-morbidity on the day of the clinic visit
IS 0 = information seeking score on the day of the clinic visit
FS 0 = functional status score on the day of the clinic visit
HS 0 = health status score on the day of the clinic visit
CS 0 = satisfaction score on the day of the clinic visit
FS 1 = functional status score one week after the clinic visit
HS 1 = health status score one week after the clinic visit
IS 6 = information seeking score six months after the clinic visit
FS 6 = functional status score six months after the clinic visit
HS 6 = health status score six months after the clinic visit
CS 6 = satisfaction score six months after the clinic visit

## Table 8-2

### Intercorrelation Matrix of Process and Outcome Variables

| | | | Provider Variables[a] | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PM | Conf | Autn | Coll | IG | JS |
| Provider Variables[a] | | PM | 1.00 | | | | | |
| | | Conf | 0.40 | 1.00 | | | | |
| | | Autn | 0.33 | 0.48 | 1.00 | | | |
| | | Coll | 0.37 | 0.23 | 0.48 | 1.00 | | |
| | | IG | 0.50 | 0.42 | 0.44 | 0.39 | 1.00 | |
| | | JS | 0.33 | 0.27 | 0.48 | 0.37 | 0.27 | 1.00 |
| Client Variables | Day of Visit[a] | Symp | -0.17 | -0.10 | -0.00 | -0.11 | -0.10 | 0.06 |
| | | Co-m | 0.06 | -0.04 | 0.07 | -0.03 | -0.01 | 0.05 |
| | | IS 0 | -0.03 | -0.02 | -0.09 | -0.06 | 0.02 | -0.05 |
| | | FS 0 | 0.13 | 0.07 | 0.07 | 0.12 | 0.00 | 0.08 |
| | | HS 0 | -0.09 | -0.05 | -0.03 | -0.10 | 0.00 | -0.11 |
| | | CS 0 | -0.14 | -0.07 | -0.14 | -0.13 | -0.08 | -0.03 |
| | One Week[b] | FS 1 | 0.07 | 0.08 | 0.05 | 0.06 | -0.01 | 0.05 |
| | | HS 1 | -0.05 | -0.03 | 0.00 | -0.05 | 0.02 | -0.14 |
| | Six Months[c] | IS 6 | -0.01 | -0.06 | 0.02 | -0.08 | -0.03 | 0.05 |
| | | FS 6 | 0.01 | -0.01 | -0.07 | 0.12 | 0.00 | 0.06 |
| | | HS 6 | 0.01 | -0.03 | 0.08 | -0.07 | 0.04 | -0.04 |
| | | CS 6 | -0.13 | -0.13 | -0.09 | -0.15 | -0.08 | 0.10 |

| | | | Client Variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day of Visit[a] | | | | | | 1 Week[b] | | 6 Months[c] | | | |
| | | | Symp | Co-m | IS 0 | FS 0 | HS 0 | CS 0 | FS 1 | HS 1 | IS 6 | FS 6 | HS 6 | CS 6 |
| Client Variables | Day of Visit[a] | Symp | 1.00 | | | | | | | | | | | |
| | | Co-m | 0.21 | 1.00 | | | | | | | | | | |
| | | IS 0 | -0.01 | -0.12 | 1.00 | | | | | | | | | |
| | | FS 0 | -0.44 | -0.38 | 0.07 | 1.00 | | | | | | | | |
| | | HS 0 | 0.36 | 0.[illegible] | -0.01 | -0.80 | 1.00 | | | | | | | |
| | | CS 0 | 0.08 | 0.02 | 0.09 | -0.19 | 0.07 | 1.00 | | | | | | |
| | One Week[b] | FS 1 | -0.29 | -0.41 | 0.04 | 0.73 | -0.71 | -0.10 | 1.00 | | | | | |
| | | HS 1 | 0.26 | 0.37 | -0.06 | -0.66 | 0.80 | 0.02 | -0.83 | 1.00 | | | | |
| | Six Months[c] | IS 6 | -0.07 | -0.14 | 0.55 | 0.12 | -0.04 | 0.09 | 0.10 | -0.08 | 1.00 | | | |
| | | FS 6 | -0.35 | -0.38 | 0.12 | 0.56 | -0.53 | -0.12 | 0.59 | -0.56 | 0.21 | 1.00 | | |
| | | HS 6 | 0.35 | 0.40 | -0.10 | -0.56 | 0.66 | 0.00 | -0.60 | 0.71 | -0.11 | -0.85 | 1.00 | |
| | | CS 6 | 0.13 | 0.03 | 0.05 | -0.11 | 0.00 | 0.73 | -0.05 | -0.02 | 0.14 | -0.11 | 0.05 | 1.00 |

[a] Sample size = 218.
[b] Sample size = 216.
[c] Sample size ranges from 160 to 167.

## Functional Status

### Group Differences on the Day of the Visit to the Clinic

The objective of this portion of the data analysis was to identify subgroups of the sample that differed in functional status on the day of the clinic visit. A series of one way analyses of variance were used to highlight group differences among beneficiary categories, age groups, genders, ethnic groups, educational backgrounds, income groups, symptoms conditions, and comorbid conditions.

Beneficiary Category. Clients were divided into four groups on the basis of their beneficiary category: active duty service members (n = 44, mean = 19.70), family of active duty service members (n = 88, mean = 19.18), retired service members (n = 36, mean = 19.11), and family of retired service members (n = 50, mean = 20.06). There were no significant differences among the groups.

Age Groups. Clients were divided into three groups on the basis of their age: under 30 years old (n = 51, mean = 19.00), 30 to 50 years old (n = 103, mean = 19.68), and over 50 years old (n = 64, mean = 19.53). There were no significant differences among the groups.

Genders. Clients were divided into two groups on the basis of their gender: male (n = 55) and female (n = 159). There were no significant differences between the groups (means were 19.22 and 19.52, respectively).

Ethnic Groups. Clients were divided into four groups on the basis of their ethnicity: Hispanic (n = 14, mean = 19.79), African American (n = 37, mean = 18.32), Caucasian (n = 145, mean = 19.61), and all others (n = 22, mean = 20.36). There were no significant differences among the groups.

Educational Backgrounds. Clients were divided into six groups on the basis of their educational background: less than high school/high school equivalency diploma/completed high school (n = 50, mean = 20.94), some college (n = 57, mean = 18.91), some college with a certificate or license (n = 19, mean = 20.37), two year college degree (n = 23, mean =19.91), four year college degree (n = 47, mean =18.43), and graduate college degree (n = 22, mean = 18.36). There were no significant differences among the groups.

Income Groups. Clients were divided into five groups on the basis of their total annual family income: less than $21,000 (n = 31, mean = 20.48), $21,000 to $40,000 (n = 81, mean = 19.32), $41,000 to $60,000 (n = 46, mean =19.52), $61,000 to $80,000 (n = 28, mean =19.57), and more than $80,000 (n = 21, mean = 18.14). There were no significant differences among the groups.

Number of Symptoms. Clients were divided into four groups on the basis of the number of symptoms they had on the day of the clinic visit: one symptom (n = 132), two (n = 39), three (n = 27), and four or five (n = 20). Groups were significantly different, F (3, 204) = 9.34, p = 0.0001 (mean for clients with one symptom = 18.02, two symptoms = 20.21, three symptoms = 21.55, and four or five symptoms = 24.90). A priori least squares mean comparisons revealed that clients with only one symptom had significantly better functional status than clients with two symptoms (p = 0.05), three symptoms (p = 0.006), or four or five symptoms (p = 0.0001). Clients with two symptoms had significantly better functional status than those with four or five symptoms (p = 0.005), but were not significantly different from those with only one symptom or with three symptoms. Clients with three symptoms were not significantly different from those with four or five symptoms.

Types of Symptoms. Clients were divided into nine groups on the basis of the nature of their primary symptom on the day of the clinic visit. The most common reason for the visit was the need for a preventive medicine procedure (such as a pap smear or a prostate examination). The next most common reason was an upper respiratory problem (including cold, flu, sinus infection, asthma, etc.), followed by musculoskeletal problems (pain, swelling, or fracture of any bone, joint, or muscle), back pain, gynecological problems (ranging from sexually transmitted disease to contraception), skin problems (such as rashes or insect bites), gastrointestinal upset (vomiting, diarrhea), and hypertension. The final category included all other problems (such things as cancer, diabetes, tooth pain, etc., each of which occurred in only one or two clients). Groups were significantly different, F (8, 209) = 6.41, p = 0.0001 (Table 8-3).

**Table 8-3**

**Functional Status by Reason for Visit**

| Reason for Visit | n | mean | standard deviation |
|---|---|---|---|
| Preventive Medicine | 56 | 16.66 | 5.89 |
| Upper Respiratory | 40 | 22.90 | 6.02 |
| Musculoskeletal | 29 | 20.45 | 5.97 |
| Back Pain | 15 | 23.73 | 5.96 |
| Skin | 12 | 14.75 | 4.00 |
| Gastrointestinal | 12 | 22.50 | 5.23 |
| Hypertension | 10 | 20.50 | 6.90 |
| Gynecology | 8 | 15.00 | 5.71 |
| Other | 36 | 19.00 | 5.46 |

Clients experiencing back pain, upper respiratory problems or gastrointestinal upset had the worst functional status, while those visiting for preventive medicine procedures, gynecological problems, or "other" problems had the best functional status. Table 8-4 shows the results of a priori least squares mean comparisons among all the groups.

**Table 8-4**

**P Values for Comparisons of Functional Status Means by Reason for Visit**

| Reason for Visit | Prev. Med. | Upper Resp. | Musc. | Back Pain | Gyne-cology | Skin | GI | Hyper-tension | Other |
|---|---|---|---|---|---|---|---|---|---|
| Preventive Medicine | | .0001 | .005 | .0001 | .45 | .30 | .002 | .05 | .06 |
| Upper Respiratory | | | .11 | .56 | .0007 | .0001 | .92 | .28 | .006 |
| Musculoskeletal | | | | .08 | .02 | .005 | .30 | .98 | .32 |
| Back Pain | | | | | .0007 | .0001 | .58 | .17 | .008 |
| Gynecology | | | | | | .92 | .005 | .05 | .08 |
| Skin | | | | | | | .001 | .02 | .03 |
| Gastrointestinal | | | | | | | | .42 | .08 |
| Hypertension | | | | | | | | | .47 |
| Other | | | | | | | | | |

Number of Comorbid Conditions. Clients were divided into five groups on the basis of the number of comorbid conditions they had on the day of the clinic visit: none ($n$ = 63), one ($n$ = 68), two ($n$ = 40), three ($n$ = 21), and four or five ($n$ = 26). Groups were significantly different, $F$ (4, 213) = 6.81, $p$ = 0.0001 (mean for clients with no conditions = 17.75, one condition = 18.59, two conditions = 19.38, three conditions = 21.52, and four or five conditions = 24.50). A priori least squares mean comparisons revealed that clients with no conditions or only one condition had significantly better functional status than clients with three conditions ($p \leq 0.05$), or four or five conditions ($p$ = 0.0001). Clients with two conditions had significantly better functional status than those with four or five conditions ($p$ = 0.0009), but were not significantly different from those with no conditions, only one condition, or three conditions. Clients with three conditions were not significantly different from those with four or five conditions.

Types of Comorbid Conditions. Clients were divided into six groups on the basis of the nature of their primary comorbid condition on the day of the clinic visit. Almost a third of the clients reported no comorbidity. The most common comorbid condition was hypertension, followed by back pain, musculoskeletal problems, and upper respiratory problems. The final category included all other problems. Groups were significantly different, $F$ (5, 212) = 3.04, $p$ = 0.01 (Table 8-5).

**Table 8-5**

**Functional Status by Comorbidity Category**

| Comorbidity Category | n | mean | standard deviation |
|---|---|---|---|
| No Cormorbidity | 61 | 17.59 | 5.15 |
| Hypertension | 39 | 20.67 | 5.88 |
| Back Pain | 25 | 22.28 | 5.76 |
| Musculoskeletal | 20 | 19.00 | 7.14 |
| Upper Respiratory | 15 | 17.20 | 6.34 |
| Other | 58 | 20.21 | 7.12 |

Clients with back pain had the worst functional status, while those with no comorbidity or upper respiratory problems had the best functional status. Table 8-6 shows the results of a priori least squares mean comparisons among all the groups.

**Table 8-6**

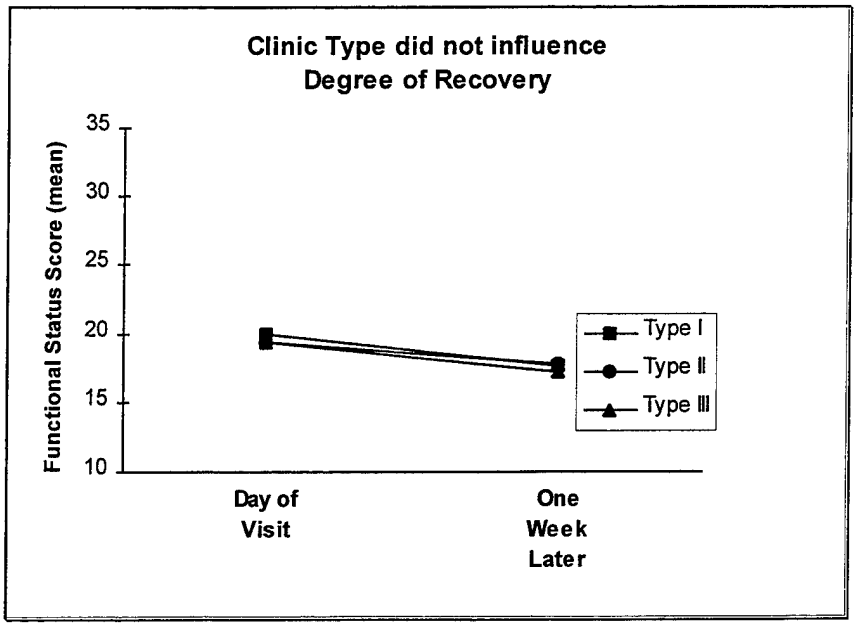
**P Values for Comparisons of Functional Status Means by Comorbidity Category**

| Comorbidity Category | None | Hyper-tension | Back Pain | Musc. | Upper Resp. | Other |
|---|---|---|---|---|---|---|
| No Cormorbidity | | .02 | .002 | .38 | .83 | .02 |
| Hypertension | | | .31 | .33 | .07 | .72 |
| Back Pain | | | | .08 | .01 | .16 |
| Musculoskeletal | | | | | .40 | .45 |
| Upper Respiratory | | | | | | .10 |
| Other | | | | | | |

Relationship of Clinic Type to Degree of Functional Status Recovery over One Week

The objective of this portion of the data analysis was to determine whether the type of clinic the client visited influenced the degree of recovery in functional status in the week following the visit. Clients were divided into three groups on the basis of the type of clinic that they visited (see page 8-29 for a definition of Clinic Type). A simple two way (3 x 2) analysis of variance was used to answer this question. Clinic Type (levels = I, II, and III) was a between-groups factor and Time (levels = Day of Visit vs One Week Later) was a repeated measures factor. The main effect of Clinic Type was not significant, nor did it interact significantly with Time. However, the main effect of Time was significant, $F$ (1, 213) = 41.69, $p$ = 0.0001. As shown in Figure 8-1, this pattern of results indicated that the client's functional status generally improved during the week following the clinic visit and that the client's degree of recovery was not related to the type of clinic in which the client was seen.

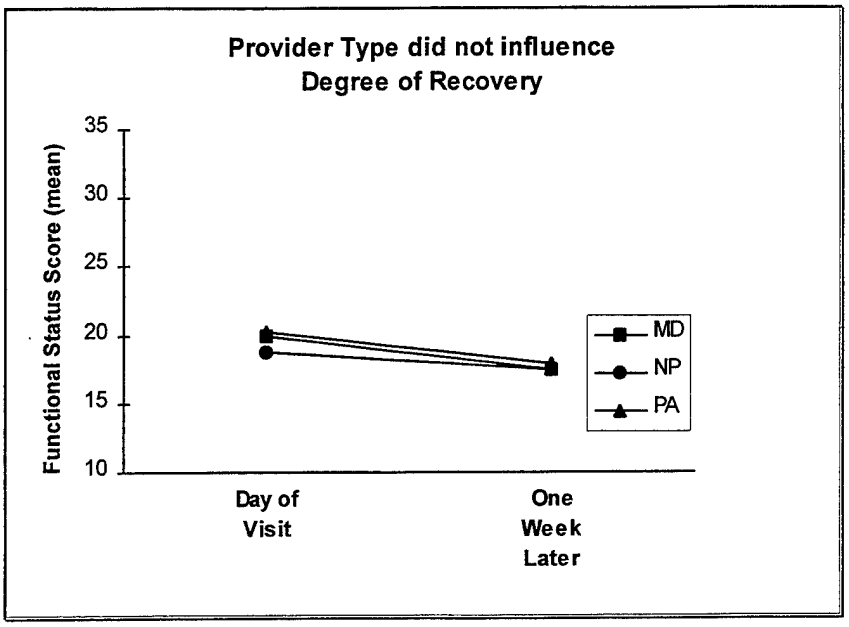
**Figure 8-1**




Relationship of Provider Type to Degree of Functional Status Recovery over One Week

The objective of this portion of the data analysis was to determine whether there were fundamental differences among types of providers that would dictate the types of analyses that could be performed on functional status data. A simple two way (3 x 2) analysis of variance was used to answer this question. Provider Type (levels = MD, NP, and PA) was a between-groups factor and Time (levels = Day of Visit vs One Week Later) was a repeated measures factor. The main effect of Provider Type was not significant, nor did it interact significantly with Time. However, the main effect of Time was significant, $F$ (1, 213) = 33.85, $p$ = 0.0001. This pattern of results is illustrated in Figure 8-2. It suggests that the client's functional status generally improved during the week following the clinic visit and that the client's degree of recovery was not related to whether the client saw a physician, nurse practitioner, or physician assistant.

**Figure 8-2**



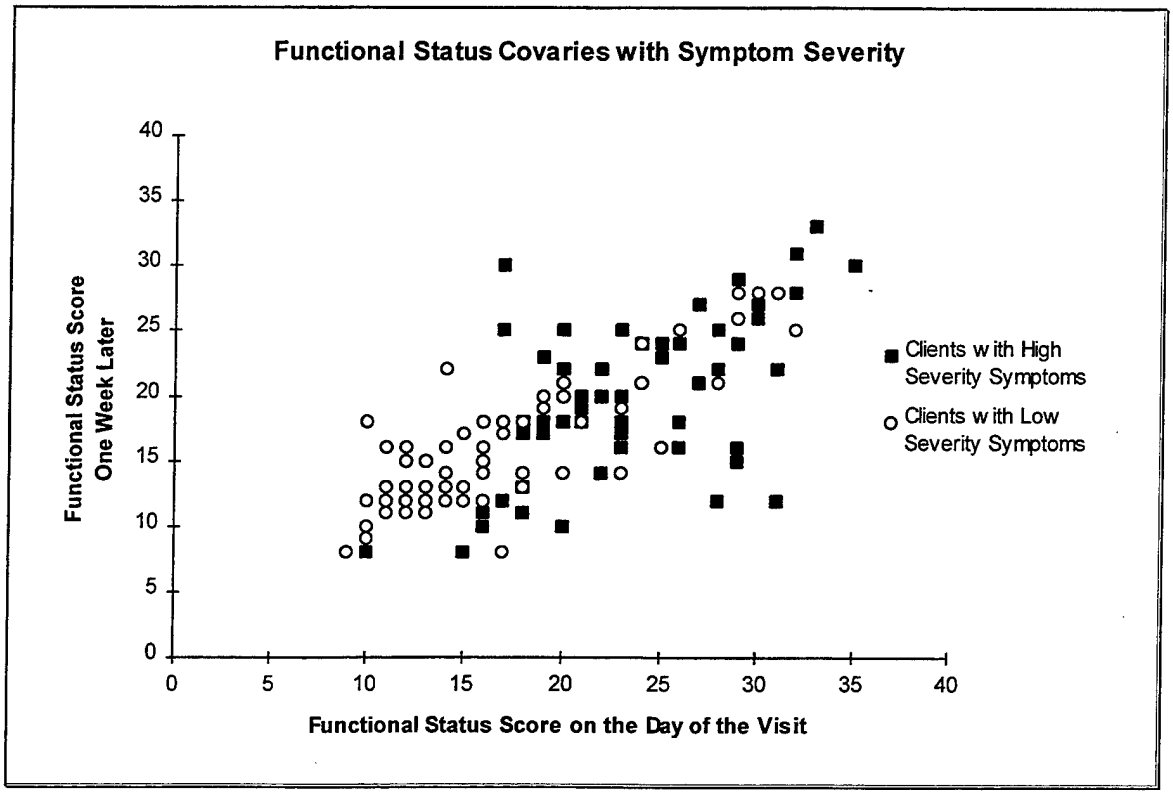

Relationship of Symptom Severity to Functional Status

The analysis of the intercorrelations of process and outcome variables (Table 8-2) showed that symptom severity and comorbidity on the day of the clinic visit were correlated with functional and health status. The objective of this portion of the data analysis was to illustrate the nature of this relationship, since it dictated the types of analyses that could be performed on client health data.

Clients were divided into three groups on the basis of their average rating of the severity of their symptoms on the day of the visit. The severity question used a five-point rating scale, on which 1 = very severe and 5 = very mild). Clients were classified into the Low Severity group, if their average symptom rating was 3.5 or greater (n = 75), into the High Severity group, if their average rating was 2.5 or less (n = 56), and into the Medium group if their average rating was between those two criteria (n = 85). A simple linear regression of functional status on the day of the clinic visit against functional status one week later was performed on each severity group. The correlation for the Low Severity group was 0.84, for the Medium Severity group was 0.67, and for the High Severity group was 0.62. Thus, blocking on the symptom severity measure did not meaningfully change the original overall correlation of 0.73 between the two functional status measures (see Table 8-2). The regression beta weights (the slope of the line) for each of the groups were virtually identical, Low = 0.73, Medium = 0.71, and High = 0.74, indicating that although symptom severity was correlated with functional status, it did not *interact* with functional status.

Figure 8-3 plots the functional status data of individual clients and highlights whether they were in the Low Severity or High Severity Group. It illustrates the strength of the correlation between the two functional status variables. A close inspection of the data reveals that for most clients, functional status improved moderately over time. It is clear from the plot that functional status scores for clients with mild symptoms clustered at the bottom (excellent) end of the scale, while scores for clients with severe symptoms clustered at the top (poor) end of the scale. For clarity, data from the Medium Severity group was not plotted in Figure 8-3; they clustered in the middle of the scale, as expected. Given this relationship, subsequent analyses were designed to identify factors which influenced recovery, while holding constant the effect of initial symptom severity and comorbidity.

**Figure 8-3**




Relationship of Provider Practice Style to Functional Status Recovery over One Week

In keeping with the overall goal of the study, the objective of this portion of the data analysis was to identify the influence of provider type and practice style variables on functional status. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 mixed analysis of variance with two covariates was used to analyze the data.

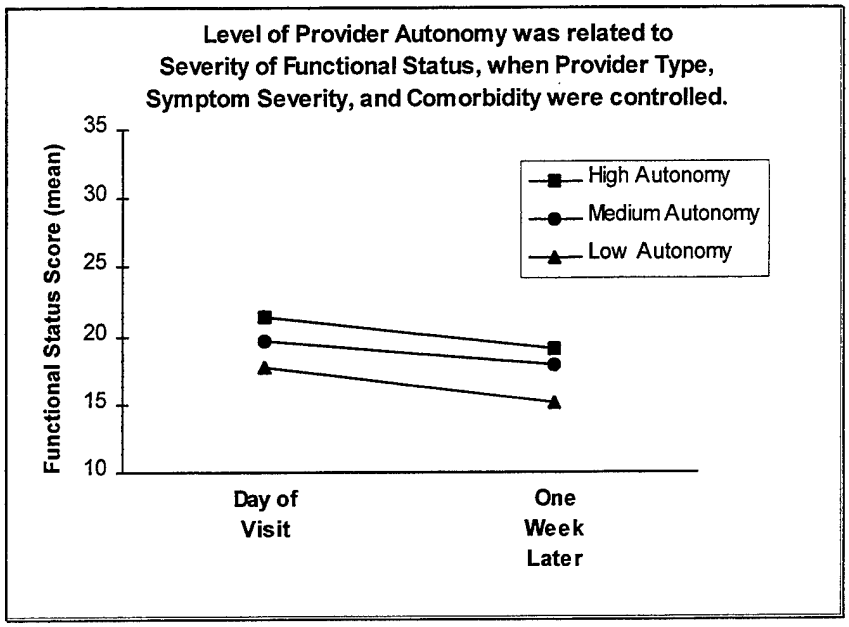
Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was a practice style variable (levels = Low, Medium, and High). These two factors were both between-groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit vs One Week Later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with functional status. In this way, it was possible to hold constant the effects of symptom severity and comorbidity while assessing whether practice style had an effect on functional status and whether the type of provider (which, by itself, had little effect on functional status) interacted with practice style to influence functional status.

Practice Model. Providers were divided into three groups on the basis of their total score on the practice model questionnaire: Low scored below 135, Medium scored between 135 and 143, and High scored above 143. There were 76 clients whose providers scored in the Low group, 81 whose providers scored in the Medium group, and 61 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with two covariates (Provider Type x Practice Model x Time, with Symptom Severity and Comorbidity) was used to analyze the degree of recovery in functional status from the day of the visit to one week Later. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 24.76, $p$ = 0.0001 and $F$ (1, 205) = 34.79, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Practice Model. However, their interaction did approach conventional levels of statistical significance, $F$ (4, 205) = 2.27, $p$ = 0.06. The main effect of Time was significant, $F$ (1, 205) = 10.51, $p$ = 0.001, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 11.33, $p$ = 0.001. No other interactions were statistically significant. This pattern of results verified that the more severe the clients' symptoms and comorbidity were, the worse the functional status was on the day of the clinic visit. However, the more severe the clients' initial symptoms were, the more recovery was evident one week later. In short, sick clients got better and healthy clients stayed that way. Furthermore, when severity and comorbidity were held constant, neither the type of provider, nor the practice model of the provider influenced the degree of recovery in functional status at one week. The fact that Provider Type and Practice Model did not interact significantly with Time makes the interpretation of the marginal significance of their two-way interaction relatively simple. Inspection of the adjusted cell means indicated that the clients of physician assistants who scored high on the practice model questionnaire had the worst functional status of all the groups and the clients of physician assistants who scored low had the best functional status. This difference probably has little clinical significance, since it is simply an exaggerated version of the pattern found for the other two groups of providers.

Confidence. Providers were divided into three groups on the basis of their total score on the confidence questionnaire: Low scored below 194, Medium scored between 194 and 225, and High scored above 225. There were 72 clients whose providers scored in the Low group, 77 whose providers scored in the Medium group, and 69 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with two covariates (Provider Type x Confidence x Time, with Symptom Severity and Comorbidity) was used to analyze the degree of recovery in functional status from the day of the visit to one week later. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 22.78, $p$ = 0.0001 and $F$ (1, 205) = 34.79, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Confidence. The main effect of Time was significant, $F$ (1, 205) = 9.60, $p$ = 0.002, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 11.78, $p$ = 0.001. No other interactions were statistically significant. This pattern of results verified that the more severe the clients' symptoms and comorbidity were, the worse the functional status was on the day of the clinic visit. However, the more severe the clients' initial symptoms were, the more recovery was evident one week later. In short, sick clients got better and healthy clients stayed that way. Furthermore, when severity and comorbidity were held constant, neither the type of provider, nor the confidence level of the provider influenced the degree of recovery in functional status at one week.

Autonomy. Providers were divided into three groups on the basis of their total score on the autonomy questionnaire: Low scored below 110, Medium scored between 110 and 125, and High scored above 125. There were 56 clients whose providers scored in the Low group, 107 whose providers scored in the Medium group, and 55 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with two covariates (Provider Type x Autonomy x Time, with Symptom Severity and Comorbidity) was used to analyze the degree of recovery in functional status from the day of the visit to one week later. Both of the covariates had statistically significant main effects, Symptom Severity, $F$ (1, 205) = 27.44, $p$ = 0.0001 and Comorbidity, $F$ (1, 205) = 34.01, $p$ = 0.0001. The main effect of Provider Type was not significant, but the main effect of Autonomy was, $F$ (2, 205) = 4.52, $p$ = 0.01 (High > Low, $p$ = 0.004; Medium > Low, $p$ = 0.02; Medium = High). The main effect of Time was significant, $F$ (1, 205) = 10.42, $p$ = 0.002, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 10.18, $p$ = 0.002. No other interactions were statistically significant. Figure 8-4 illustrates the effect of autonomy, showing the mean functional status over time of clients whose providers were from different autonomy groups (means were adjusted for symptom severity and comorbidity).

**Figure 8-4**




The overall pattern of results indicates that (a) providers with the greatest autonomy were seeing clients with the worst functional status (according to a priori least squares means comparison), (b) this relationship was true regardless of whether the provider was a physician, nurse practitioner, or physician assistant, (c) the more severe the clients' symptoms and comorbidity were, the worse the functional status was on the day of the clinic visit, and (d) the more severe the clients' initial symptoms were, the more recovery was evident one week later (sick clients got better and healthy clients stayed that way).

Collaboration. Providers were divided into three groups on the basis of their total score on the collaboration questionnaire: Low scored below 76, Medium scored between 76 and 88, and High scored above 88. There were 68 clients whose providers scored in the Low group, 87 whose providers scored in the Medium group, and 63 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with two covariates (Provider Type x Collaboration x Time, with Symptom Severity and Comorbidity) was used to analyze the degree of recovery in functional status from the day of the visit to one week later. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 26.48, $p$ = 0.0001 and $F$ (1, 205) = 32.19, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Collaboration. The main effect of Time was significant, $F$ (1, 205) = 9.49, $p$ = 0.002, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 12.67, $p$ = 0.0005. No other interactions were statistically significant. This pattern of results verified that the more severe the clients' symptoms and comorbidity were, the worse the functional status was

on the day of the clinic visit. However, the more severe the clients' initial symptoms were, the more recovery was evident one week later. In short, sick clients got better and healthy clients stayed that way. Furthermore, when severity and comorbidity were held constant, neither the type of provider, nor the collaboration level of the provider influenced the degree of recovery in functional status at one week.

Information Giving. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 71 clients whose providers scored in the Low group, 64 whose providers scored in the Medium group, and 83 whose providers scored in the High group. A 3 x 3 x 2 analysis of variance with two covariates (Provider Type x Information Giving x Time, with Symptom Severity and Comorbidity) was used to analyze the degree of recovery in functional status from the day of the visit to one week later. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 29.78, $p$ = 0.0001 and $F$ (1, 205) = 33.39, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Information Giving. However, their interaction was significant, $F$ (4, 205) = 2.59, $p$ = 0.04. The main effect of Time was significant, $F$ (1, 205) = 10.14, $p$ = 0.002, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 12.25, $p$ = 0.0006. No other interactions were statistically significant. This pattern of results verified that the more severe the clients' symptoms and comorbidity were, the worse the functional status was on the day of the clinic visit. However, the more severe the clients' initial symptoms were, the more recovery was evident one week later. In short, sick clients got better and healthy clients stayed that way. Furthermore, when severity and comorbidity were held constant, neither the type of provider, nor the information giving level of the provider influenced the degree of recovery in functional status at one week. The fact that Provider Type and Information Giving did not interact significantly with Time makes the interpretation of their two-way interaction relatively simple. Inspection of the adjusted cell means indicated that one group accounted for the significant interaction. The clients of physician assistants who scored in the medium group on the information giving questionnaire had the best functional status. This difference probably has little clinical significance, since there were only five clients in this group (as compared to 17 to 37 clients in the other groups).

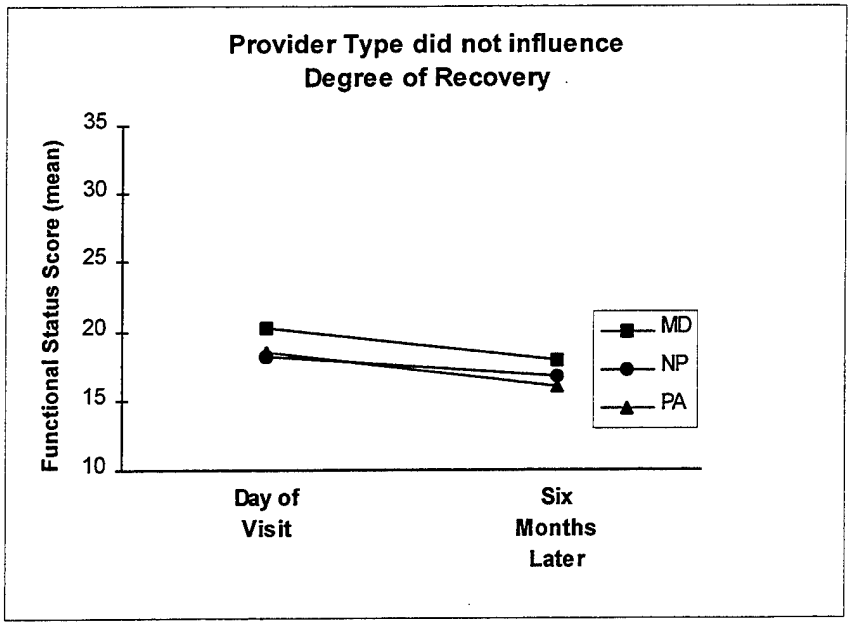
Job Satisfaction. Providers were divided into three groups on the basis of their total score on the job satisfaction questionnaire. However, physician assistants were not evenly distributed across the three groups; they tended to score low or high, but not in the middle range. Thus, for this analysis, the medium and high groups were combined. Providers were divided into two

groups on the basis of their total score on the job satisfaction questionnaire: Low scored below 72, Medium/High scored above 72. There were 67 clients whose providers scored in the Low group and 149 whose providers scored in the High group. A 3 x 2 x 2 analysis of variance with two covariates (Provider Type x Job Satisfaction x Time, with Symptom Severity and Comorbidity) was used to analyze the degree of recovery in functional status from the day of the visit to one week later. Both of the covariates had statistically significant main effects, Symptom Severity, $F$ (1, 208) = 30.74, $p$ = 0.0001 and Comorbidity, $F$ (1, 208) = 34.65, $p$ = 0.0001. The main effect of Provider Type was not significant, but the main effect of Job Satisfaction was, $F$ (1, 208) = 4.67, $p$ = 0.03. The main effect of Time was significant, $F$ (1, 208) = 9.86, $p$ = 0.002, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 208) = 11.42, $p$ = 0.0001. No other interactions were statistically significant. The overall pattern of results indicates that (a) providers with medium to high job satisfaction saw sicker clients (Medium/High mean = 19.00, Low = 17.33), (b) this relationship was true regardless of whether the provider was a physician, nurse practitioner, or physician assistant, (c) the more severe the clients' symptoms and comorbidity were, the worse the functional status was on the day of the clinic visit, and (d) the more severe the clients' initial symptoms were, the more recovery was evident one week later (sick clients got better and healthy clients stayed that way).

Relationship of Provider Type to Degree of Functional Status Recovery over Six Months

The objective of this portion of the data analysis was to determine whether there were fundamental differences among types of providers that would dictate the types of analyses that could be performed on functional status data. A simple two way (3 x 2) analysis of variance was used to answer this question. Provider Type (levels = MD, NP, and PA) was a between-groups factor and Time (levels = Day of Visit vs Six Months Later) was a repeated measures factor. The pattern of results at six months was quite similar to that at one week. Time was the only significant effect in the analysis, $F$ (1, 164) = 16.45, $p$ = 0.0001. Client functional status generally improved during the six months following the clinic visit and the client's degree of recovery was not related to whether the client saw a physician, nurse practitioner, or physician assistant. Figure 8-5 illustrates these results.

**Figure 8-5**



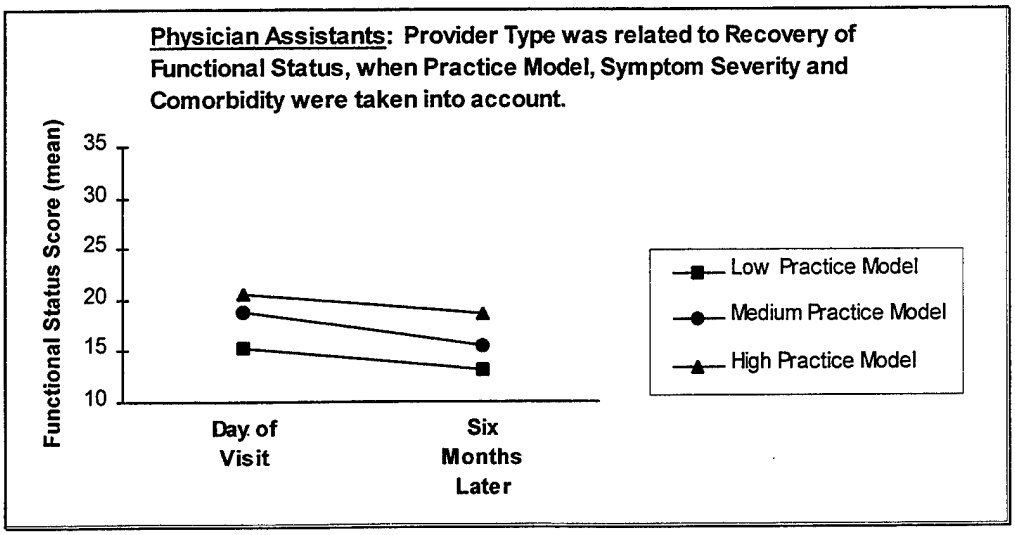

Relationship of Provider Practice Style to Functional Status Recovery over Six Months

In keeping with the overall goal of the study, the objective of this portion of the data analysis was to identify the influence of provider type and practice style variables on functional status. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 mixed analysis of variance with two covariates was used to analyze the data. Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was a practice style variable (levels = Low, Medium, and High). These two factors were both between-groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit vs Six Months Later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with functional status. In this way, it was possible to hold constant the effects of symptom severity and comorbidity while assessing whether practice style had an effect on functional status and whether the type of provider (which, by itself, had little effect on functional status) interacted with practice style to influence functional status.

Practice Model. Providers were divided into three groups on the basis of their total score on the practice model questionnaire: Low scored below 135, Medium scored between 135 and 143, and High scored above 143. There were 61 clients whose providers scored in the Low group, 62 whose providers scored in the Medium group, and 44 whose providers scored in the High group. The analysis of the degree of recovery in functional status from the day of the visit to six months later produced results similar to those found with functional status at one week. Both

symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 34.13, $p$ = 0.0001 and $F$ (1, 156) = 29.87, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Practice Model. In this case, the Provider Type x Practice Model x Time interaction was significant, $F$ (4, 156) = 2.49, $p$ = 0.05. No other interactions were statistically significant. This pattern of results verifies the reliability of the pattern seen for functional status at one week. The clients of physician assistants who scored high on the practice model questionnaire had poorer functional status than clients of physician assistants who scored low on the practice model. This was true both on the day of the visit and six months later ($p$ = 0.05 and $p$ = 0.03, respectively, by a priori least squares means comparison). Clients of physician assistants who scored in the middle range on the practice model questionnaire showed moderate functional status and were not significantly different from either the high or low groups at either timepoint. All clients of physician assistants showed improvement from the day of the visit to six months later (low group, $p$ = 0.03; medium group, $p$ < 0.01; high group, $p$ = 0.05). Figure 8-6 illustrates these differences.

**Figure 8-6**




Figures 8-7 and 8-8 show a contrasting pattern of results for the clients of physicians and nurse practitioners. Clients of providers who differed in practice model did not show the same degree of recovery. Clients of physicians in both the high and medium practice model groups showed improvement in functional status over the six month period, while clients of those in the low group did not (day of visit vs six months later for the high group, $p$ = 0.01 and for the medium group, $p$ < 0.01, by a priori least squares means comparison). Clients of nurse practitioners in both the high and low practice model groups showed improvement in functional status over the six month period, while clients of those in the medium group did not (day of visit vs six months later

for the high group, $p < 0.01$ and for the low group, $p = 0.01$, by a priori least squares means comparison).

**Figure 8-7**

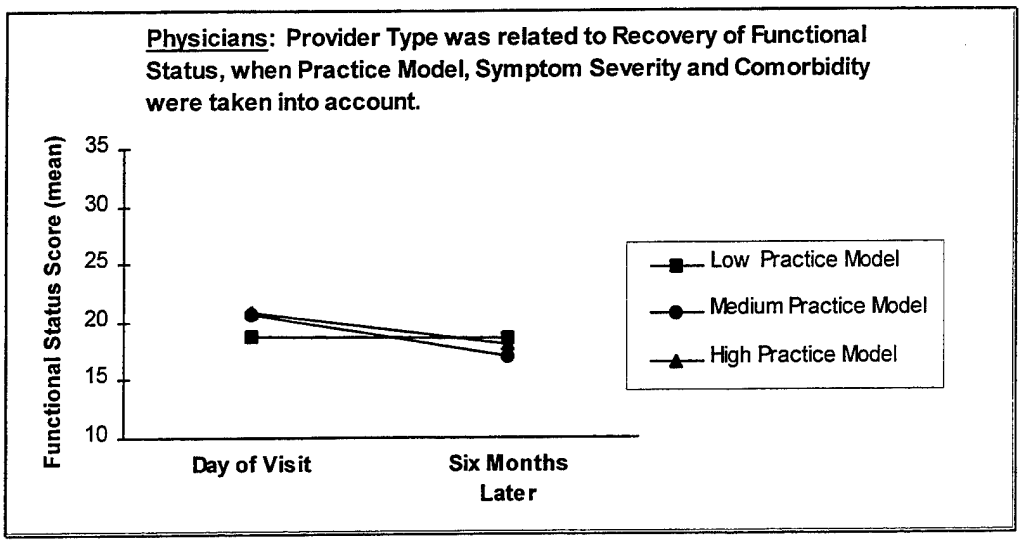
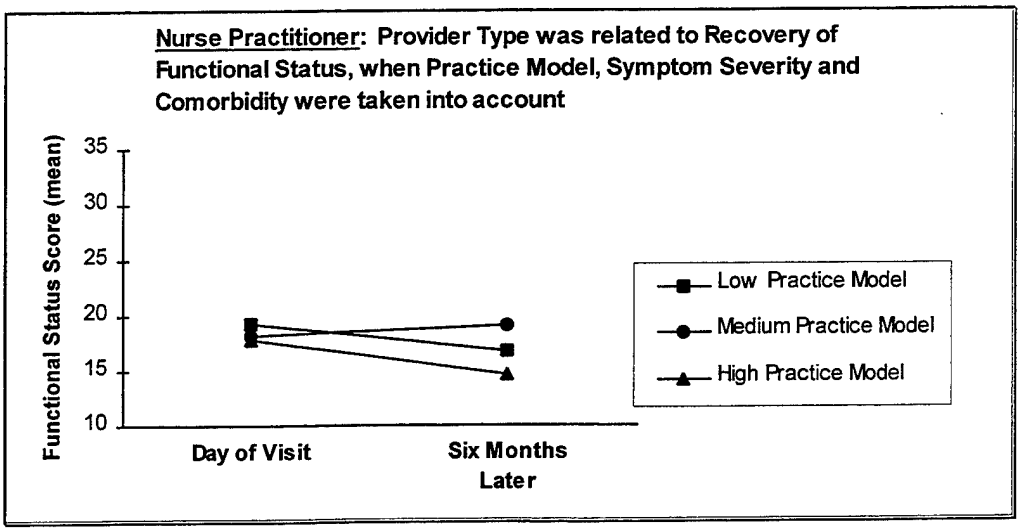



**Figure 8-8**




Confidence. Providers were divided into three groups on the basis of their total score on the confidence questionnaire: Low scored below 194, Medium scored between 194 and 225, and High scored above 225. There were 58 clients whose providers scored in the Low group, 56 whose providers scored in the Medium group, and 53 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F(1, 156) = 29.21$, $p = 0.0001$ and $F(1, 156) = 27.01$, $p = 0.0001$, respectively. No other main effects or

interactions were statistically significant. In short, when severity and comorbidity were held constant, functional status at six months was equivalent to functional status on the day of the visit and neither the type of provider, nor the confidence level of the provider influenced functional status.

Autonomy. Providers were divided into three groups on the basis of their total score on the autonomy questionnaire: Low scored below 110, Medium scored between 110 and 125, and High scored above 125. There were 45 clients whose providers scored in the Low group, 79 whose providers scored in the Medium group, and 43 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 33.87, $p$ = 0.0001 and $F$ (1, 156) = 24.27, $p$ = 0.0001, respectively. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, functional status at six months was equivalent to functional status on the day of the visit and neither the type of provider, nor the autonomy level of the provider influenced functional status.

Collaboration. Providers were divided into three groups on the basis of their total score on the collaboration questionnaire: Low scored below 76, Medium scored between 76 and 88, and High scored above 88. There were 51 clients whose providers scored in the Low group, 71 whose providers scored in the Medium group, and 45 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 33.03, $p$ = 0.0001 and $F$ (1, 156) = 25.96, $p$ = 0.0001, respectively. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, functional status at six months was equivalent to functional status on the day of the visit and neither the type of provider, nor the collaboration level of the provider influenced functional status.

Information Giving. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 53 clients whose providers scored in the Low group, 52 whose providers scored in the Medium group, and 62 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 34.37, $p$ = 0.0001 and $F$ (1, 156) = 27.96, $p$ = 0.0001, respectively. The main effect of Provider Type was significant, $F$ (2, 156) = 3.18, $p$ = 0.04. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, functional status at six months was equivalent to functional status on the day of the visit and

neither the type of provider, nor the information giving level of the provider influenced recovery. However, the type of provider was associated with the overall severity of functional status (when variance due to Information Giving was taken into account). Clients with the worst functional status were seeing physicians and clients with the best functional status were seeing physician assistants (MD mean = 18.92, NP = 18.04, and PA = 16.05; MD > PA, $p = 0.01$; MD = NP; NP = PA).

Job Satisfaction. Providers were divided into three groups on the basis of their total score on the job satisfaction questionnaire. However, physician assistants were not evenly distributed across the three groups; they tended to score low or high, but not in the middle range. Thus, for this analysis, the medium and high groups were combined. Providers were divided into two groups on the basis of their total score on the job satisfaction questionnaire: Low scored below 72, Medium/High scored above 72. There were 50 clients whose providers scored in the Low group and 117 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 159) = 36.87, $p = 0.0001$ and $F$ (1, 159) = 26.24, $p = 0.0001$, respectively. The main effect of Job Satisfaction was significant, $F$ (1, 159) = 4.29, $p = 0.04$. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, functional status at six months was equivalent to functional status on the day of the visit and neither the type of provider, nor the job satisfaction of the provider influenced recovery. However, the job satisfaction of the provider was associated with the overall severity of functional status. That is, the finding that providers with medium to high job satisfaction saw sicker clients (Medium/High mean = 18.51, Low = 16.75) was demonstrated at both one week and at six months.

## Health Status

### Group Differences on the Day of the Visit to the Clinic

The objective of this portion of the data analysis was to identify subgroups of the sample that differed in health status on the day of the clinic visit. A series of one way analyses of variance were used to highlight group differences among beneficiary categories, age groups, genders, ethnic groups, educational backgrounds, income groups, symptoms conditions, and comorbid conditions.

Beneficiary Category. Clients were divided into four groups on the basis of their beneficiary category (Table 8-7). Groups were significantly different, $F$ (3, 214) = 3.22, $p = 0.02$. A priori least squares mean comparisons revealed that family members of active duty personnel

had significantly better health status than family members of retired personnel ($p = 0.003$). Active duty and retired personnel were not significantly different from each other or from their family members.

**Table 8-7**

**Health Status by Beneficiary Category**

| Beneficiary Category | n | mean | standard deviation |
|---|---|---|---|
| Active Duty | 44 | 117.70 | 19.60 |
| Family of Active Duty | 88 | 123.08 | 19.96 |
| Retired | 36 | 116.47 | 24.95 |
| Family of Retired | 50 | 110.94 | 26.55 |

Age Groups. Clients were divided into three groups on the basis of their age (Table 8-8). Groups were significantly different, $F (2, 215) = 5.47$, $p = 0.005$. A priori least squares mean comparisons revealed that clients who were less than 30 years old had significantly better health status than those who were over 50 years old ($p = 0.01$), but were not significantly different from those in the 30 to 50 year old group. Similarly, clients who were 30 to 50 years old had significantly better health status than those who were over 50 years old ($p = 0.002$).

**Table 8-8**

**Health Status by Age Group**

| Age Group | n | mean | standard deviation |
|---|---|---|---|
| under 30 | 51 | 120.69 | 20.31 |
| 30 to 50 | 103 | 121.65 | 19.34 |
| over 50 | 64 | 110.39 | 27.64 |

Genders. Clients were divided into two groups on the basis of their gender: male ($n = 55$) and female ($n = 159$). There were no significant differences among the groups (means were 117.44 and 118.46, respectively).

Ethnic Groups. Clients were divided into four groups on the basis of their ethnicity: Hispanic ($n = 14$, mean = 114.57), African American ($n = 37$, mean = 122.97), Caucasian American ($n = 145$, mean = 117.37), and all others ($n = 22$, mean = 117.18). There were no significant differences among the groups.

Educational Backgrounds. Clients were divided into six groups on the basis of their educational background: less than high school/high school equivalency diploma/completed high school ($n$ = 50, mean = 112.32), some college ($n$ = 57, mean = 119.77), some college with a certificate or license ($n$ = 19, mean = 116.53), two year college degree ($n$ = 23, mean = 121.91), four year college degree ($n$ = 47, mean = 121.04), and graduate college degree ($n$ = 22, mean = 118.18). There were no significant differences among the groups.

Income Groups. Clients were divided into five groups on the basis of their total annual family income: less than $21,000 ($n$ = 31, mean = 111.68), $21,000 to $40,000 ($n$ = 81, mean = 118.81), $41,000 to $60,000 ($n$ = 46, mean = 118.89), $61,000 to $80,000 ($n$ = 28, mean = 115.14), and more than $80,000 ($n$ = 21, mean = 126.95). There were no significant differences among the groups.

Number of Symptoms. Clients were divided into four groups on the basis of the number of symptoms they had on the day of the clinic visit: one symptom ($n$ = 132), two ($n$ = 39), three ($n$ = 27), and four or five ($n$ = 20). Groups were significantly different, $F$ (3, 214) = 4.37, $p$ = 0.005 (mean for clients with one symptom = 122.00, two symptoms = 115.46, three symptoms = 112.67, and four or five symptoms = 105.05). A priori least squares mean comparisons revealed that clients with only one symptom had significantly better health status than clients with three symptoms ($p$ = 0.05) or four or five symptoms ($p$ = 0.002). Clients with two symptoms were not significantly different from those with one, three, or four or five symptoms. Clients with three symptoms were not significantly different from those with four or five symptoms.

Types of Symptoms. Clients were divided into nine groups on the basis of the nature of their primary symptom on the day of the clinic visit. The most common reason for the visit was the need for a preventive medicine procedure (such as a pap smear or a prostate examination). The next most common reason was an upper respiratory problem (including cold, flu, sinus infection, asthma, etc.), followed by musculoskeletal problems (pain, swelling, or fracture of any bone, joint, or muscle), back pain, gynecological problems (ranging from sexually transmitted disease to contraception), skin problems (such as rashes or insect bites), gastrointestinal upset (nausea, vomiting, diarrhea), and hypertension. The final category included all other problems (such things as cancer, diabetes, tooth pain, hernia, etc., each of which occurred in only one or two clients). Groups were significantly different, $F$ (8, 209) = 3.92, $p$ = 0.0002 (Table 8-9).

**Table 8-9**

**Health Status by Reason for Visit**

| Reason for Visit | n | mean | standard deviation |
|---|---|---|---|
| Preventive Medicine | 56 | 126.54 | 21.16 |
| Upper Respiratory | 40 | 109.48 | 21.29 |
| Musculoskeletal | 29 | 116.52 | 21.09 |
| Back Pain | 15 | 104.27 | 23.08 |
| Skin | 12 | 134.50 | 8.48 |
| Gastrointestinal | 12 | 114.00 | 17.29 |
| Hypertension | 10 | 111.10 | 32.38 |
| Gynecology | 8 | 125.13 | 19.19 |
| Other | 36 | 117.33 | 23.54 |

Clients experiencing back pain, upper respiratory problems or gastrointestinal upset had the worst health status, while those visiting for preventive medicine procedures, or skin problems had the best health status. Table 8-10 shows the results of a priori least squares mean comparisons among all the groups.

**Table 8-10**

**P Values for Comparisons of Health Status Means by Reason for Visit**

| Reason for Visit | Prev. Med. | Upper Resp. | Musc. | Back Pain | Gyne-cology | Skin | GI | Hyper-tension | Other |
|---|---|---|---|---|---|---|---|---|---|
| Preventive Medicine | | .0002 | .04 | .0005 | .85 | .25 | .07 | .04 | .05 |
| Upper Respiratory | | | .18 | .43 | .03 | .0005 | .53 | .83 | .12 |
| Musculoskeletal | | | | .08 | .18 | .02 | .73 | .50 | .88 |
| Back Pain | | | | | .01 | .0004 | .25 | .44 | .05 |
| Gynecology | | | | | | .52 | .15 | .10 | .20 |
| Skin | | | | | | | .02 | .01 | .02 |
| Gastrointestinal | | | | | | | | .75 | .64 |
| Hypertension | | | | | | | | | .42 |
| Other | | | | | | | | | |

Number of Comorbid Conditions. Clients were divided into five groups on the basis of the number of comorbid conditions they had on the day of the clinic visit: none (n = 63), one (n = 68),

two (n = 40), three (n = 21), and four or five (n = 26). Groups were significantly different, F (4, 213) = 10.45, p = 0.0001 (mean for clients with no conditions = 125.60, one condition = 121.69, two conditions = 119.23, three conditions = 108.76, and four or five conditions = 96.50). A priori least squares mean comparisons revealed that clients with no conditions or only one condition had significantly better health status than clients with three conditions ($p \leq 0.01$), or four or five conditions (p = 0.0001). Clients with two conditions had significantly better health status than those with four or five conditions (p = 0.0001), but were not significantly different from those with no conditions, only one condition, or three conditions. Clients with three conditions had significantly better health status than those with four or five conditions (p = 0.05).

Types of Comorbid Conditions. Clients were divided into six groups on the basis of the nature of their primary comorbid condition on the day of the clinic visit. Almost a third of the clients reported no comorbidity. The most common comorbid condition was hypertension, followed by back pain, musculoskeletal problems, and upper respiratory problems. The final category included all other problems. Groups were significantly different, F (5, 212) = 3.25, p = 0.008 (Table 8-11).

**Table 8-11**

**Health Status by Comorbidity Category**

| Comorbidity Category | n | mean | standard deviation |
|---|---|---|---|
| No Cormorbidity | 61 | 126.38 | 16.63 |
| Hypertension | 39 | 112.03 | 22.92 |
| Back Pain | 25 | 112.56 | 22.25 |
| Musculoskeletal | 20 | 116.70 | 24.61 |
| Upper Respiratory | 15 | 125.53 | 15.85 |
| Other | 58 | 114.50 | 26.78 |

Clients with back pain and hypertension had the worst health status, while those with no comorbidity or upper respiratory problems had the best health status. Table 8-12 shows the results of a priori least squares mean comparisons among all the groups.

**Table 8-12**

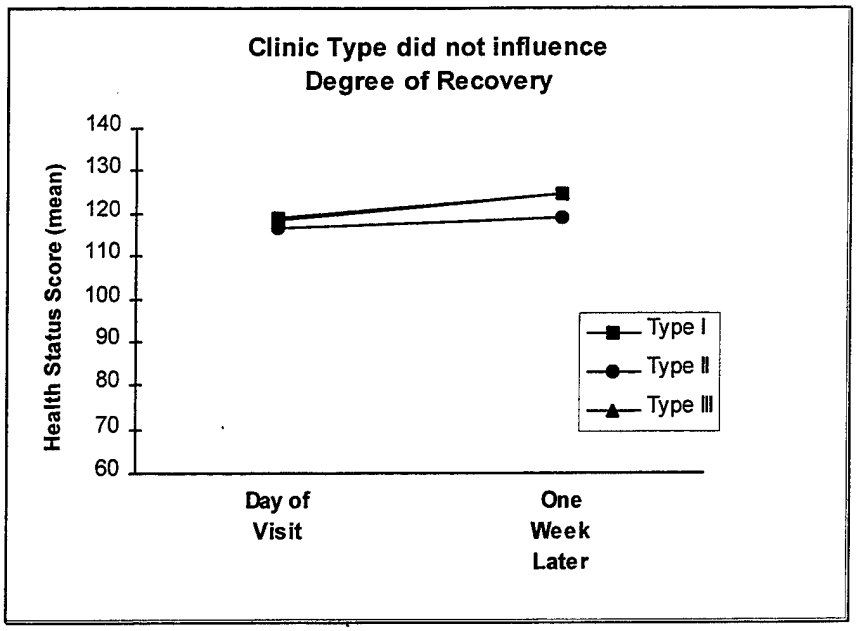
**P Values for Comparisons of Health Status Means by Comorbidity Category**

| Comorbidity Category | None | Hyper-tension | Back Pain | Musc. | Upper Resp. | Other |
|---|---|---|---|---|---|---|
| No Cormorbidity | | .002 | .009 | .09 | .90 | .004 |
| Hypertension | | | .93 | .44 | .05 | .59 |
| Back Pain | | | | .53 | .07 | .72 |
| Musculoskeletal | | | | | .25 | .70 |
| Upper Respiratory | | | | | | .09 |
| Other | | | | | | |

Relationship of Clinic Type to Degree of Health Status Recovery over One Week

The objective of this portion of the data analysis was to determine whether the type of clinic the client visited influenced the degree of recovery in health status in the week following the visit. Clients were divided into three groups on the basis of the type of clinic that they visited (see page 8-29 for a definition of Clinic Type). A simple two way (3 x 2) analysis of variance was used to answer this question. Clinic Type (levels = I, II, and III) was a between-groups factor and Time (levels = Day of Visit vs One Week Later) was a repeated measures factor. The main effect of Clinic Type was not significant, nor did it interact significantly with Time. However, the main effect of Time was significant, $F$ (1, 213) = 22.84, $p$ = 0.0001. As shown in Figure 8-9, this pattern of results indicated that the client's health status generally improved during the week following the clinic visit and that the client's degree of recovery was not related to the type of clinic in which the client was seen.

**Figure 8-9**

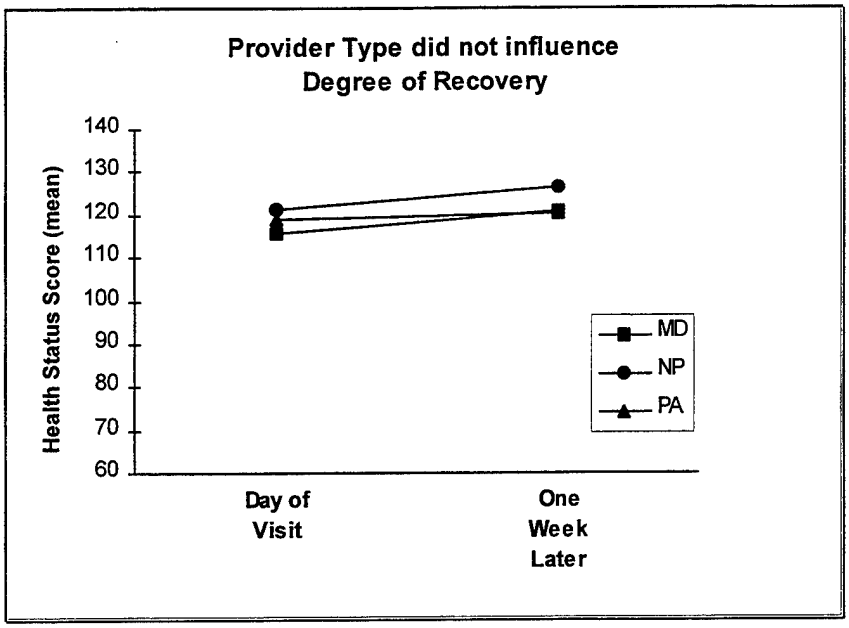



Type I and Type III means were identical.

Relationship of Provider Type to Degree of Health Status Recovery over One Week

The objective of this portion of the data analysis was to determine whether there were fundamental differences among types of providers that would dictate the types of analyses that could be performed on health status data. A simple two way (3 x 2) analysis of variance was used to answer this question. Provider Type (levels = MD, NP, and PA) was a between-groups factor and Time (levels = Day of Visit vs One Week Later) was a repeated measures factor. Predictably, given the correlation of functional and health status, the analysis of health status data yielded results equivalent to those found with functional status. Time was the only significant effect, $F$ (1, 213) = 13.03, $p$ = 0.0004, indicating that the client's health status generally improved during the week following the clinic visit and that the client's degree of recovery was not related to whether the client saw a physician, nurse practitioner, or physician assistant. Figure 8-10 illustrates these results.

**Figure 8-10**




Relationship of Provider Practice Style to Health Status Recovery over One Week

In keeping with the overall goal of the study, the objective of this portion of the data analysis was to identify the influence of provider type and practice style variables on health status. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 mixed analysis of variance with two covariates was used to analyze the data. Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was a practice style variable (levels = Low, Medium, and High). These two factors were both between-groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit vs One Week Later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with health status. In this way, it was possible to hold constant the effects of symptom severity and comorbidity while assessing whether practice style had an effect on health status and whether the type of provider (which, by itself, had little effect on health status) interacted with practice style to influence health status.

Practice Model. Providers were divided into three groups on the basis of their total score on the practice model questionnaire: Low scored below 135, Medium scored between 135 and 143, and High scored above 143. There were 76 clients whose providers scored in the Low group, 81 whose providers scored in the Medium group, and 61 whose providers scored in the High group. The analysis of the degree of recovery in health status from the day of the visit to one week later produced results equivalent to those found with functional status. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 14.43, $p$ = 0.0002

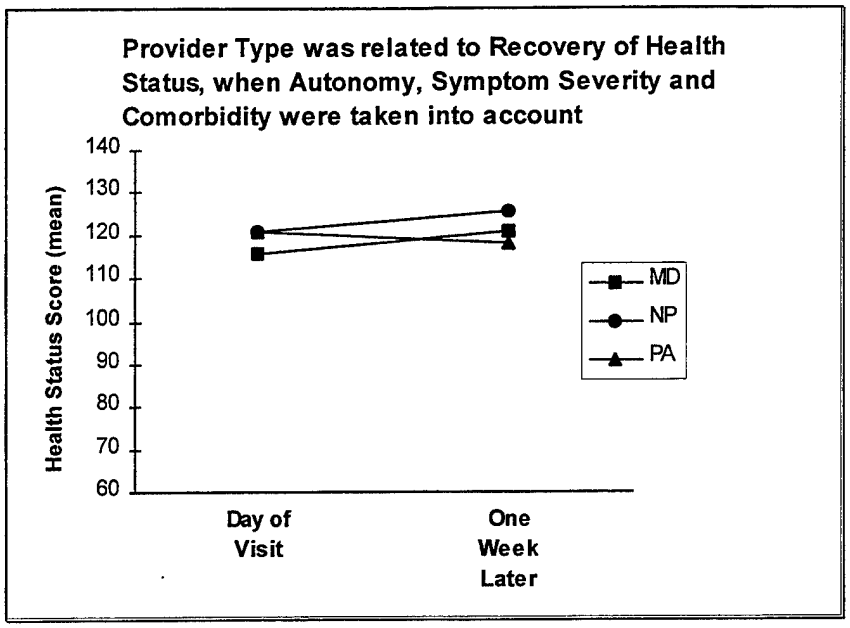
and F (1, 205) = 26.76, p = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Practice Model. Their interaction was not statistically significant. The main effect of Time was significant, F (1, 205) = 5.99, p = 0.02, however, the interaction of Time and Symptom Severity was also significant, F (1, 205) = 5.84, p = 0.02. No other interactions were statistically significant.

Confidence. Providers were divided into three groups on the basis of their total score on the confidence questionnaire: Low scored below 194, Medium scored between 194 and 225, and High scored above 225. There were 72 clients whose providers scored in the Low group, 77 whose providers scored in the Medium group, and 69 whose providers scored in the High group. The analysis of the degree of recovery in health status from the day of the visit to one week later produced results equivalent to those found with functional status. Both symptom severity and comorbidity had statistically significant main effects, F (1, 205) = 15.10, p = 0.0001 and F (1, 205) = 26.17, p = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Confidence. The main effect of Time was significant, F (1, 205) = 6.18, p = 0.01, however, the interaction of Time and Symptom Severity was also significant, F (1, 205) = 6.84, p = 0.01. No other interactions were statistically significant.

Autonomy. Providers were divided into three groups on the basis of their total score on the autonomy questionnaire: Low scored below 110, Medium scored between 110 and 125, and High scored above 125. There were 56 clients whose providers scored in the Low group, 107 whose providers scored in the Medium group, and 55 whose providers scored in the High group. The analysis of the degree of recovery in health status from the day of the visit to one week later produced results quite similar to those found with functional status. Both symptom severity and comorbidity had statistically significant main effects, F (1, 205) = 16.75, p = 0.0001 and F (1, 205) = 27.18, p = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Autonomy. The main effect of Time was significant, F (1, 205) = 10.51, p = 0.001, however, the interaction of Time and Symptom Severity was also significant, F (1, 205) = 11.33, p = 0.001. Moreover, the interaction of Time with Provider Type was marginally significant, F (2, 205) = 2.78, p = 0.06. No other interactions were statistically significant. The fact that health status was not associated with the provider's level of autonomy (as it was for functional status) may reflect the more global nature of the health status measure. The interaction of Provider Type with Time was unexpected given that this effect had not appeared in any of the analyses of functional status at one week and had appeared in only one other analysis of health status at one week (see Information Giving). Figure 8-11 shows the adjusted cell means for this interaction (Day of Visit: MD = NP = PA; One Week Later: MD = NP = PA; MD: Day of Visit < One Week

Later, p = 0.01; NP: Day of Visit < One Week Later, p = 0.01; PA: Day of Visit > One Week Later, p < 0.05). Clearly, the clients of physician assistants did not show the same recovery of health status (in the first week after a clinic visit) that was shown by the clients of other providers.

**Figure 8-11**

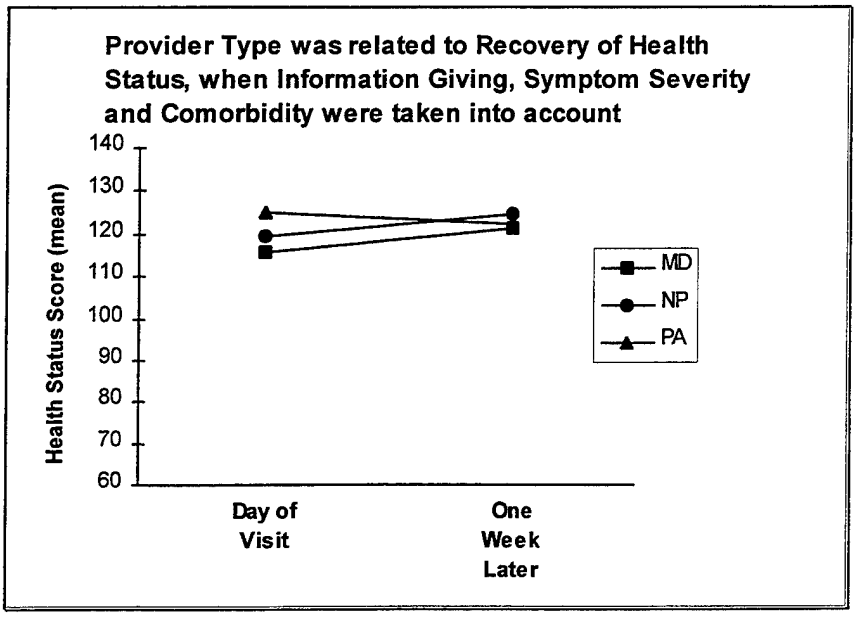



Collaboration. Providers were divided into three groups on the basis of their total score on the collaboration questionnaire: Low scored below 76, Medium scored between 76 and 88, and High scored above 88. There were 68 clients whose providers scored in the Low group, 87 whose providers scored in the Medium group, and 63 whose providers scored in the High group. The analysis of the degree of recovery in health status from the day of the visit to one week later produced results equivalent to those found with functional status. Both symptom severity and comorbidity had statistically significant main effects, F (1, 205) = 16.11, p = 0.0001 and F (1, 205) = 24.84, p = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Collaboration. The main effect of Time was significant, F (1, 205) = 6.26, p = 0.01, however, the interaction of Time and Symptom Severity was also significant, F (1, 205) = 9.25, p = 0.003. No other interactions were statistically significant.

Information Giving. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 71 clients whose providers scored in the Low group, 64 whose providers scored in the Medium group, and 83 whose providers scored in the High group. The analysis of the degree of recovery in health status from the day of the visit to one

week later produced results equivalent to those found with functional status. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 205) = 19.45, $p$ = 0.0001 and $F$ (1, 205) = 26.64, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant, nor was the main effect of Information Giving. The main effect of Time was significant, $F$ (1, 205) = 5.31, $p$ = 0.02, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 205) = 7.81, $p$ = 0.006. Moreover, the interaction of Time with Provider Type was significant, $F$ (2, 205) = 3.42, $p$ = 0.03. No other interactions were statistically significant. The fact that Provider Type did not interact with Information Giving (as it did for functional status) may reflect the more global nature of the health status measure. The interaction of Provider Type with Time was unexpected given that this effect had not appeared in any of the analyses of functional status at one week and had appeared in only one other analysis of health status at one week (see Autonomy). Figure 8-12 shows the adjusted cell means for this interaction (Day of Visit: MD < PA, $p$ = 0.04; MD = NP; NP = PA; One Week Later: MD = NP = PA; MD: Day of Visit < One Week Later, $p$ = 0.01; NP: Day of Visit < One Week Later, $p$ = 0.01; PA: Day of Visit > One Week Later, $p$ < 0.05). Clearly, the clients of physician assistants did not show the same recovery of health status (in the first week after a clinic visit) that was shown by the clients of other providers.

**Figure 8-12**

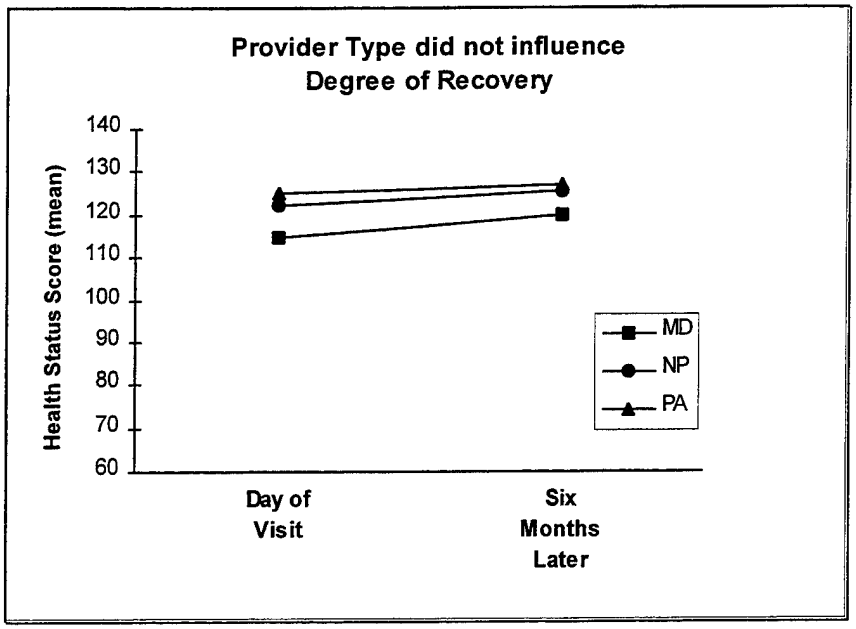


Job Satisfaction. Providers were divided into three groups on the basis of their total score on the job satisfaction questionnaire. However, physician assistants were not evenly distributed across the three groups; they tended to score low or high, but not in the middle range. Thus, for this analysis, the medium and high groups were combined. Providers were divided into two groups on the basis of their total score on the job satisfaction questionnaire: Low scored below 72, Medium/High scored above 72. There were 67 clients whose providers scored in the Low group and 149 whose providers scored in the High group. The analysis of the degree of recovery in health status from the day of the visit to one week later produced results equivalent to those found with functional status. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 208) = 19.26, $p$ = 0.0001 and $F$ (1, 208) = 28.88, $p$ = 0.0001, respectively. The main effect of Provider Type was not significant. The main effect of Job Satisfaction was significant, $F$(1, 208) = 7.92, $p$ = 0.005. Thus, the finding that providers with medium to high job satisfaction saw sicker clients (Medium/High mean = 126.49, Low = 118.15) was demonstrated on both measures of health outcomes. The main effect of Time was significant, $F$ (1, 208) = 8.87, $p$ = 0.02, however, the interaction of Time and Symptom Severity was also significant, $F$ (1, 208) = 7.01, $p$ = 0.009. No other interactions were statistically significant.

Relationship of Provider Type to Degree of Health Status Recovery over Six Months

The objective of this portion of the data analysis was to determine whether there were fundamental differences among types of providers that would dictate the types of analyses that could be performed on health status data. A simple two way (3 x 2) analysis of variance was used to answer this question. Provider Type (levels = MD, NP, and PA) was a between-groups factor and Time (levels = Day of Visit vs Six Months Later) was a repeated measures factor. The main effect of Provider Type was significant $F$ (1, 164) = 2.99, $p$ = 0.05, as was the main effect of Time, $F$ (1, 164) = 4.44, $p$ = 0.04. The factors did not interact significantly. Figure 8-13 illustrates these results (MD < NP, $p$ = 0.05; MD < PA, $p$ = 0.05; NP = PA on Day of Visit; MD = NP = PA Six Months Later; Day of Visit < Six Months Later, $p$ = 0.04).

**Figure 8-13**




This pattern of results suggests three findings: (a) physicians tended to see more clients whose overall health status was worse (according to a priori least squares means comparisons), (b) the client's health status generally improved during the six months following the clinic visit, and (c) the client's degree of recovery was not related to whether the client saw a physician, nurse practitioner, or physician assistant.

Relationship of Provider Practice Style to Health Status Recovery over Six Months

In keeping with the overall goal of the study, the objective of this portion of the data analysis was to identify the influence of provider type and practice style variables on health status. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 3 x 2 mixed analysis of variance with two covariates was used to analyze the data. Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was a practice style variable (levels = Low, Medium, and High). These two factors were both between-groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit vs Six Months later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with health status. In this way, it was possible to hold constant the effects of symptom severity and comorbidity while assessing whether practice style had an effect on health status and whether the type of provider (which, by itself, had little effect on health status) interacted with practice style to influence health status.

Practice Model. Providers were divided into three groups on the basis of their total score on the practice model questionnaire: Low scored below 135, Medium scored between 135 and 143, and High scored above 143. There were 61 clients whose providers scored in the Low group, 62 whose providers scored in the Medium group, and 44 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 21.01, $p$ = 0.0001 and $F$ (1, 156) = 24.37, $p$ = 0.0001, respectively. The main effect of Provider Type was significant, $F$ (2, 156) = 3.93, $p$ = 0.02. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the type of provider, nor the practice model category of the provider influenced recovery. However, the type of provider was associated with the overall severity of health status. Clients with the worst health status were seeing physicians and clients with the best health status were seeing physician assistants (MD mean = 117.31, NP = 123.09, and PA = 127.55; MD > PA, $p$ = 0.01; MD = NP, $p$ = 0.05; NP = PA).

Confidence. Providers were divided into three groups on the basis of their total score on the confidence questionnaire: Low scored below 194, Medium scored between 194 and 225, and High scored above 225. There were 58 clients whose providers scored in the Low group, 56 whose providers scored in the Medium group, and 53 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 20.37, $p$ = 0.0001 and $F$ (1, 156) = 23.15, $p$ = 0.0001, respectively. The main effect of Provider Type was significant, $F$ (2, 156) = 3.29, $p$ = 0.04. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the type of provider, nor the confidence level of the provider influenced recovery. However, the type of provider was associated with the overall severity of health status. Clients with the worst health status were seeing physicians and clients with the best health status were seeing physician assistants (MD mean = 117.33, NP = 122.71, and PA = 126.64; MD > PA, $p$ = 0.03; MD = NP; NP = PA).

Autonomy. Providers were divided into three groups on the basis of their total score on the autonomy questionnaire: Low scored below 110, Medium scored between 110 and 125, and High scored above 125. There were 45 clients whose providers scored in the Low group, 79 whose providers scored in the Medium group, and 43 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 21.49, $p$ = 0.0001 and $F$ (1, 156) = 22.63, $p$ = 0.0001, respectively. No other main effects or

interactions were statistically significant. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the type of provider, nor the autonomy level of the provider influenced health status.

Collaboration. Providers were divided into three groups on the basis of their total score on the collaboration questionnaire: Low scored below 76, Medium scored between 76 and 88, and High scored above 88. There were 51 clients whose providers scored in the Low group, 71 whose providers scored in the Medium group, and 45 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 20.57, $p$ = 0.0001 and $F$ (1, 156) = 22.81, $p$ = 0.0001, respectively. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the type of provider, nor the collaboration level of the provider influenced recovery.

Information Giving. Providers were divided into three groups on the basis of their total score on the information giving questionnaire: Low scored below 56, Medium scored between 56 and 64, and High scored above 64. There were 53 clients whose providers scored in the Low group, 52 whose providers scored in the Medium group, and 62 whose providers scored in the High group. Both symptom severity and comorbidity had statistically significant main effects, $F$ (1, 156) = 25.01, $p$ = 0.0001 and $F$ (1, 156) = 23.93, $p$ = 0.0001, respectively. The main effect of Provider Type was significant, $F$ (2, 156) = 3.57, $p$ = 0.03. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the type of provider, nor the information giving level of the provider influenced recovery. However, the type of provider was associated with the overall severity of health status, just as it was for functional status at six months. Clients with the worst health status were seeing physicians and clients with the best health status were seeing physician assistants (MD mean = 118.03, NP = 121.98, and PA = 129.18; MD > PA, $p$ = 0.01; MD = NP; NP = PA).

Job Satisfaction. Providers were divided into three groups on the basis of their total score on the job satisfaction questionnaire. However, physician assistants were not evenly distributed across the three groups; they tended to score low or high, but not in the middle range. Thus, for this analysis, the medium and high groups were combined. Providers were divided into two groups on the basis of their total score on the job satisfaction questionnaire: Low scored below 72, Medium/High scored above 72. There were 50 clients whose providers scored in the Low group and 117 whose providers scored in the High group. Both symptom severity and

comorbidity had statistically significant main effects, $F$ (1, 159) = 25.00, $p$ = 0.0001 and $F$ (1, 159) = 25.22, $p$ = 0.0001, respectively. The main effect of Job Satisfaction was significant, $F$ (1, 159) = 5.74, $p$ = 0.02. No other main effects or interactions were statistically significant. In short, when severity and comorbidity were held constant, health status at six months was equivalent to health status on the day of the visit and neither the type of provider, nor the job satisfaction of the provider influenced recovery. However, the job satisfaction of the provider was associated with the overall severity of health status. That is, the finding that providers with medium to high job satisfaction saw sicker clients (Medium/High mean = 119.99, Low = 127.55) was demonstrated at both one week and at six months.

## Relationship of Provider Type and Symptom Category to Degree of Recovery

There was a disturbing trend in the health status data. It was readily apparent in Figures 8-10 and 8-13 that there was a slight difference among provider types. The clients of physician assistants were not showing the same degree of recovery as those of physicians and nurse practitioners. Although this difference was small, it had not occurred in any other analyses and so warranted further investigation. In this study, physician assistants were found in five of the nine clinics. They practiced in three Type I clinics (seeing predominantly active duty clients in a Troop Medical Clinic setting) and in two Type II clinics (seeing retirees and family members of both active duty personnel and retirees, but not seeing any active duty clients). Physicians were found in eight out of the nine clinics and nurse practitioners were found in all nine clinics. Both military and civilian physician assistants were included in the sample. Figure 8-9 makes it clear that differences in clinic types did not account for the apparent difference in provider types and Table 8-7 makes it clear that differences in beneficiary categories did not account for the apparent difference in provider types. However, Tables 2-2 and 2-3 (see Chapter 2) suggest that perhaps the differences among provider types might be a function of the types of health conditions that physician assistants were routinely seeing. Compared to physicians and nurse practitioners, a smaller percentage of the physician assistants' practice was devoted to clients visiting for preventive medicine procedures and a larger percentage was devoted to clients visiting for musculoskeletal illness/injury and back pain problems. However, upper respiratory problems made up 17% to 20% of the practice of all three types of providers. Clients visiting the clinic for these two symptom categories, musculoskeletal illness/injury and upper respiratory problems, had the worst health status of all the clients. Therefore an analysis of the influence of symptom category on health status was conducted to determine whether this factor accounted for the apparent difference in provider types.

For this analysis, clients were divided into groups on the basis of the type of provider they had seen on the day of the visit and then further subdivided on the basis of whether they were visiting the provider for a musculoskeletal injury/illness (including back pain) or for an upper respiratory problem. This subsample of 84 included sufficient diversity for statistical analysis. For example, 52% of the sample were seen for musculoskeletal problems and 48% were seen for upper respiratory problems. Similarly, 49% of the clients saw physicians, 26% saw nurse practitioners, and 24% saw physician assistants. Active duty personnel made up 22%, 26%, and 50% of the clients seeing physicians, nurse practitioners, and physician assistants, respectively.

Relationship of Provider Type and Symptom Category:
Degree of Health Status Recovery at One Week

The objective of this portion of the data analysis was to identify the influence of provider type and symptom category on health status. A straightforward analysis of variance and covariance approach was used to analyze the data. A 3 x 2 x 2 mixed analysis of variance with two covariates was used to analyze the data. Provider Type (levels = MD, NP, and PA) was the first factor in each analysis and the second was symptom category (levels = musculoskeletal illness/injury, including back pain, and upper respiratory problems). These two factors were both between groups factors. The third factor was a repeated measures factor of Time (levels = Day of Visit vs One Week later). The Symptom Severity and Comorbidity variables were included as covariates in the model due to their strong correlation with health status. In this way, it was possible to hold constant the effects of symptom severity and comorbidity while assessing whether the type of provider interacted with symptom category to influence health status.

**Figure 8-14**

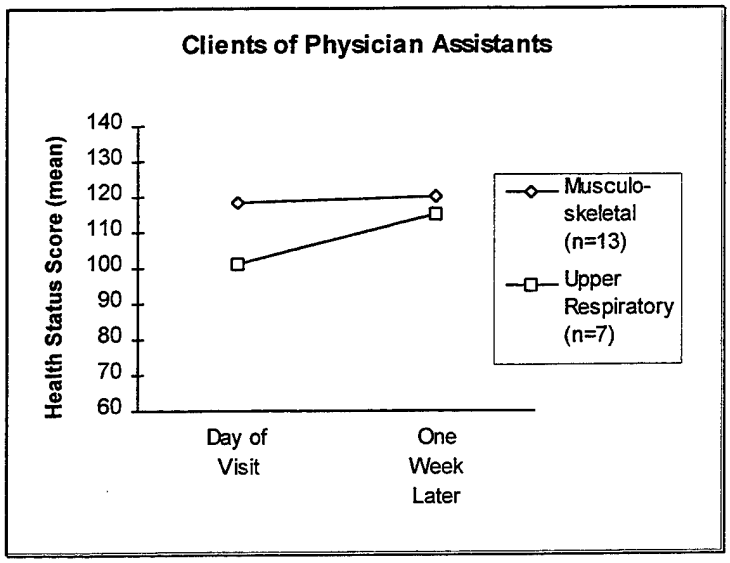


**Figure 8-15**

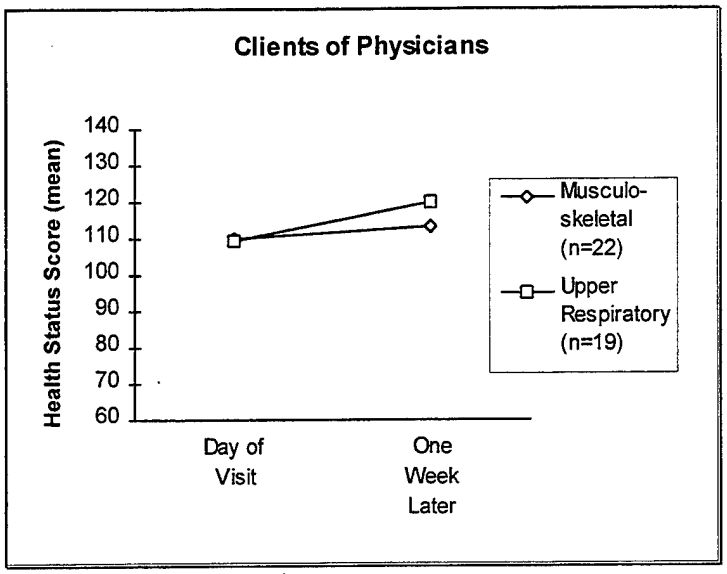
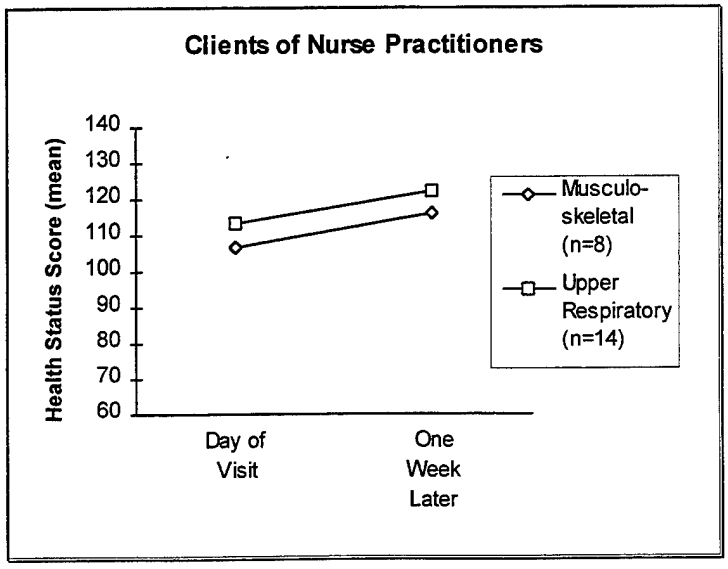



**Figure 8-16**




Both symptom severity and comorbidity had statistically significant main effects, F (1, 75) = 10.00, p = 0.002 and F (1, 75) = 8.16, p = 0.006, respectively. The main effect of Provider Type was not significant, nor was the main effect of Symptom Category. The main effect of Time was significant, F (1, 75) = 5.56, p = 0.02, however, the interaction of Time and Symptom Severity was marginally significant, F (1, 75) = 3.53, p = 0.06. No other interactions were statistically significant. Figures 8-14, 8-15, and 8-16 illustrate the means of the Provider Type x Symptom Category x Time interaction (adjusted for severity and comorbidity). It is clear that all clients who

were being seen for upper respiratory problems showed good improvement in health status over the first week. The clients of physician assistants were no different in this regard. It is also clear that the clients of ***both*** physicians and physician assistants who were being seen for musculoskeletal illness/injury (including back pain) did not show any improvement in health status over the first week. This trend is, once again, readily apparent, but not statistically significant.

Relationship of Provider Type and Symptom Category:
Degree of Functional Status Recovery at One Week

In the interest of thoroughness, an identical analysis of functional status data was conducted. Both symptom severity and comorbidity had statistically significant main effects, $F(1, 75) = 5.98$, $p = 0.02$ and $F(1, 75) = 12.00$, $p = 0.0009$, respectively. The main effect of Provider Type was not significant, nor was the main effect of Symptom Category. The main effect of Time was significant, $F(1, 75) = 3.91$, $p = 0.05$. No interactions were statistically significant. Figures 8-17, 8-18, and 8-19 illustrate the means of the Provider Type x Symptom Category x Time interaction (adjusted for severity and comorbidity). It is clear that all clients did show good improvement in functional status over the first week regardless of which type of provider they saw and regardless of which category of health problem they had. These data verify that all three types of providers were equally effective in achieving positive changes in functional status, the critical factor in ***returning soldiers to duty*** (and in returning family members and retirees to independent living).

**Figure 8-17**

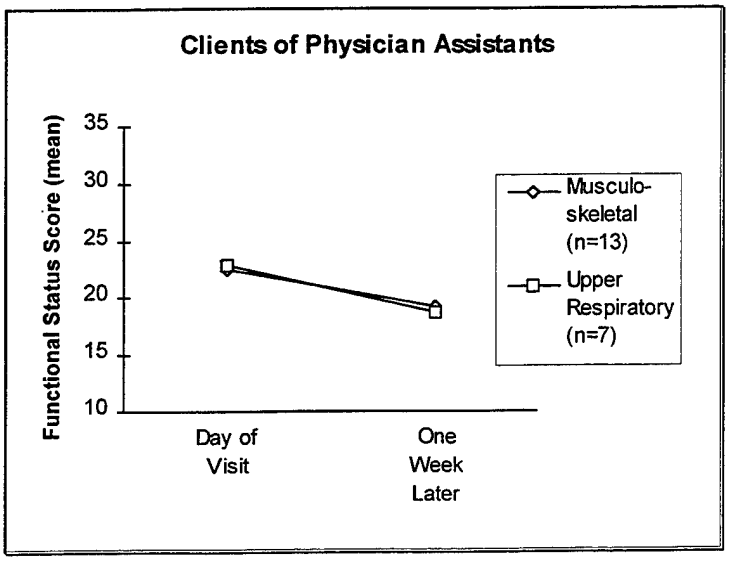


**Figure 8-18**

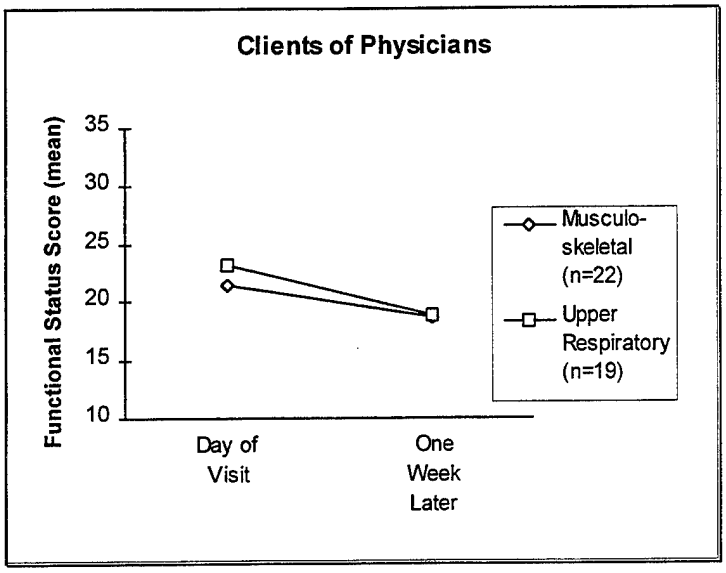
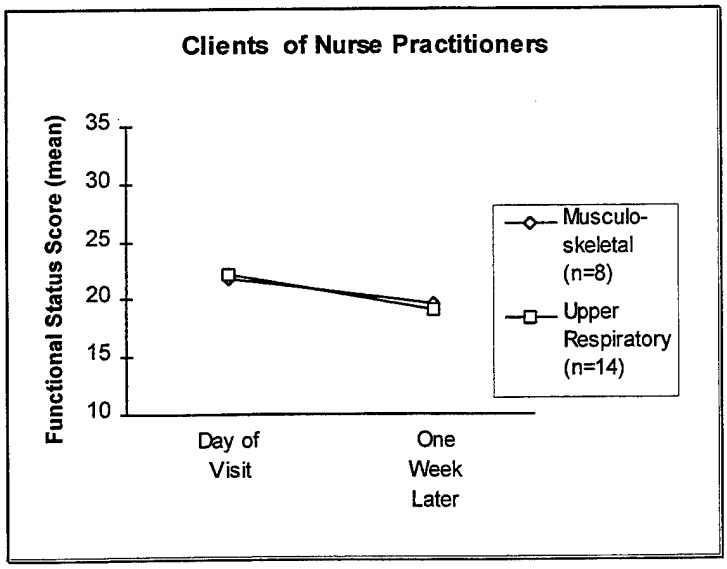



**Figure 8-19**




In summary, these data clearly highlight the difficulty in successfully treating musculoskeletal injury/illness. They show that physician assistants are capable of achieving health outcomes equivalent to those achieved by other physician and non-physician providers. When the results of the analyses of the health and the functional status data are considered

together, the only conclusion that can reasonably be drawn from the available data is that the health status measure is more sensitive to negative outcomes than the functional status measure.

## Conclusions

### Functional status

(1) The majority of clients had good functional status; that is, they could perform most daily activities normally.

(2) In contrast to the results of previous research, there were no significant differences in functional status for different beneficiary categories, age groups, genders, ethnic groups, educational levels, income groups, or clinic types.

(3) Congruent with previous research, there were significant differences in functional status as a function of the type of presenting symptom. Clients with back pain, upper respiratory problems, or gastrointestinal upset had the worst functional status, while those visiting for preventive medicine procedures or gynecological problems had the best functional status. Similarly, clients with no comorbidity had the best functional status and those with comorbid back pain had the worst.

(4) There was no significant difference in the degree of recovery of functional status in the week following a clinic visit among clients who saw physicians, nurse practitioners, or physician assistants.

(5) When data were controlled for the severity of the client's symptoms and comorbidity and the practice style of the provider, it was clear that the more severe the clients symptoms and comorbidity were on the day of the visit to the clinic, the more recovery of functional status was evident one week later. In short, sick clients got better and healthy clients stayed that way. This was true regardless of whether the client saw a physician, nurse practitioner, or physician assistant.

(6) Providers who scored high on the autonomy questionnaire and high on the job satisfaction questionnaire saw the sickest clients. This was true regardless of whether the provider was a physician, nurse practitioner, or physician assistant, even when data were controlled for the severity of the client's symptoms and comorbidity.

(7) There was no significant difference in the degree of recovery of functional status in the six months following a clinic visit among clients who saw physicians, nurse practitioners, or physician assistants.

Health Status

(1) Although the results of functional status and health status analyses were often equivalent, health status was more sensitive than functional status to negative outcomes.

(2) The majority of clients were quite healthy.

(3) In contrast to the results of previous research, there were no significant differences in health status for different genders, ethnic groups, educational levels, income groups, or clinic types.

(4) Congruent with previous research, there were significant differences in health status as a function of beneficiary categories, age groups, and the type of presenting symptom. Family members of retired personnel had the worst health status. Clients over 50 had the worst health status. Clients with back pain, upper respiratory problems, or gastrointestinal upset had the worst health status, while those visiting for preventive medicine procedures or skin problems had the best health status. Similarly, clients with no comorbidity had the best health status and those with comorbid back pain or hypertension had the worst.

(5) There was no significant difference in the degree of recovery of health status in the week following a clinic visit among clients who saw physicians, nurse practitioners, or physician assistants.

(6) When data were controlled for the severity of the client's symptoms/comorbidity and the practice style of the provider, it was clear that the more severe the clients' symptoms/ comorbidity were on the day of the visit to the clinic, the more recovery of health status was evident one week later. In short, sick clients got better and healthy clients stayed that way. This was true regardless of whether the client saw a physician, nurse practitioner, or physician assistant.

(7) When data were controlled for the severity of the client's symptoms and comorbidity and the practice style of the provider, physicians saw clients with the worst health status.

(8) Clients with musculoskeletal injury or back pain were less likely to show good recovery of health status.

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## CHAPTER 9

## METHOD AND RELIABILITY/VALIDITY ASSESSMENT

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## Method

### Design

This multicenter study used a prospective, longitudinal (repeated measures), correlational design to evaluate change in client outcomes as a function of provider practice styles, client and provider demographics, and clinic characteristics. The design of this survey research project was coordinated with the Army Personnel Survey Office (Soldier Support Center - National Capital Region). Questionnaires used in this project were classified as exempt from the provisions of Army Regulation 600-46, Attitude and Opinion Survey Program. All of the practice style and outcome questionnaires used in the study were developed from questionnaires that had been used successfully in other settings (Beaufait, et al., 1992; Dempster, 1990 & 1991; Hays, Sherbourne, & Mazel, 1993; Hopkins, 1986; Kravitz, Thomas, Sloss, & Hosek, 1993; Mangelsdorff, 1994; Mangelsdorff, Twist, Zucker, Ware, & George, 1992; Stichler, 1990 & 1992; Thibodeau & Hawkins, 1994). Appendix A contains a copy of each of the data collection instruments used in the study.

Providers completed a demographics questionnaire and six practice style questionnaires that measured their practice model, confidence, autonomy, collaboration practices, attitudes towards giving information, and job satisfaction. Clients completed demographics and symptoms questionnaires and four outcome questionnaires on the day of a visit to their primary care provider. The outcome questionnaires measured functional status, health status, attitudes towards seeking information, and satisfaction with healthcare services. One-week later, clients completed the functional status and health status questionnaires again, along with a follow-up symptom questionnaire. Six months later, clients completed the functional status, health status, information seeking, and client satisfaction questionnaires again, along with a follow-up symptom questionnaire. At the time of the six month follow-up, each client's medical record was reviewed by a registered nurse investigator.

### Sample Size

The goal of the study was to obtain a sample size equivalent to a typical day's census of non-pediatric, non-obstetric clients visiting enrolled clinics for a new complaint. Data from the Army's Composite Health Care System (CHCS) database were used to define an appropriate sample size. In November, 1995, there were 180 providers assigned to the nine clinics enrolled in the study. On a typical day, the nine clinics recorded approximately 1,100 to 1,400 clinic visits by 110 to 120 providers (not counting immunizations, counseling classes, and telephone consults). Of those visits, 360 to 400 were potentially eligible for the study; i.e., they were visits to an enrolled provider and were not pediatric or obstetric visits. Although CHCS data do not clearly

differentiate between clients coming in for follow-up appointments and those coming in for a new complaint, experience during the data collection process indicated that approximately 60% of non-pediatric, non-obstetric visits in the nine primary care clinics were visits for a new complaint. Rates of visits for new complaints in clinics providing family care services were sometimes lower, while rates of visits in clinics providing sick call services were often higher. Thus, 215 to 240 of the potentially eligible clinic visits were eligible first time visits. Data from clients were collected over an eight month period to insure that a wide variety of cases and situations were included. Data collection was terminated when completed questionnaires were received from 226 clients.

Study Sites

Three sites participated in the study: Fort Belvoir, VA; Fort Bragg, NC; and Fort Lewis, WA. Nine primary care clinics (three from each site) were enrolled in the study. Typical medium-sized primary care clinics providing a broad spectrum of services to a population living in close proximity to the clinic were chosen. Some clinics were located inside the medical center and others were located in residential areas at varying distances from the center. All the clinics were open during the day and several of the clinics were open during the evening hours and on weekends. They represented large beneficiary populations from geographically distant regions of the country, well-established primary/ambulatory care programs, both urban and rural locales, installations with missions that ran the gamut from combat arms to combat service support, and methods of staffing clinics which ranged from using predominantly military personnel to predominantly civilian personnel.

Subjects

Due to the sensitive nature of the provider-client interaction and the need to review medical records, providers and clients were briefed by the investigators on the purpose and requirements of the study. Providers and clients volunteered to participate in the study and gave their written informed consent. Investigators adhered to the guidleines of Army Regulation 40-38, "Clinical Investigation Program" and the "Ethical Principles of Psychologists and Code of Conduct" (APA, 1992). Data were maintained in a manner which protected the anonymity of volunteers and the confidentiality of their data.

Providers. Providers were recruited without regard to age, gender, ethnoculture, source of employment (military, civil servant, or contract), number of hours per week spent in the clinic, or credential (physician, nurse practitioner, or physician assistant). However, providers who saw only clients under 18 years, only obstetric clients, or only clients for physical examination were excluded from participation along with those who did not expect to be working in the clinic for the

next six months. There were 113 eligible providers in the nine clinics. Completed consent forms and questionnaires were received from 58 primary care providers: 26 physicians, 19 nurse practitioners, and 13 physician assistants (46%, 76%, and 41%, respectively, of those eligible). An analysis of the CHCS data from the nine clinics enrolled in the study demonstrated that the providers who volunteered for the study saw the same types of clients in the same frequencies as providers who did not (Mark, Mays, & Byers, 1996).

Physicians ranged in age from 28 to 69 years old, with an average age of 41. Eighty percent of the physicians were male and 20% were female. Sixty-five percent were Caucasian-American, 15% were Asian-American, 8% were African-American, and 12% identified with other ethnic categories. All the physicians (100%) had Medical Doctor or Doctor of Osteopathy degrees. Physicians had an average of 12.4 years experience in a health care occupation. They had an average of 8.8 years experience as a provider in a military medical facility and an average of 2.0 years experience as a provider in a civilian medical facility. They had an average of 2.1 years experience in their current clinic. This sample of physicians practiced in North Carolina (23%), Virginia (35%), and Washington (42%).

Nurse practitioners ranged in age from 30 to 52 years old, with an average age of 41. Forty-seven percent of the nurse practitioners were male and 53% were female. Seventy-nine percent were Caucasian-American, 11% were African-American, 5% were Asian-American, and 5% were Hispanic-American. All but one of the nurse practitioners (95%) had Master's degrees. Nurse practitioners had an average of 16.3 years experience in a health care occupation. They had an average of 6.0 years experience as a provider in a military medical facility and an average of 0.7 years experience as a provider in a civilian medical facility. They had an average of 1.1 years experience in their current clinic. This sample of nurse practitioners practiced in North Carolina (42%), Virginia (16%), and Washington (42%).

Physician assistants ranged in age from 32 to 50 years old, with an average age of 39. Seventy-seven percent of the physician assistants were male and 23% were female. Eighty-four percent were Caucasian-American, 8% were Asian-American, and 8% were African-American. Fifteen percent of the physician assistants had an Associate's degree and 77% had a Bachelor's degree. One physician assistant (8%) was a graduate of a foreign medical school. Physician assistants had an average of 15.7 years experience in a health care occupation. They had an average of 6.2 years experience as a provider in a military medical facility and an average of 2.6 years experience as a provider in a civilian medical facility. They had an average of 1.4 years experience in their current clinic. This sample of physician assistants practiced in North Carolina (38%), Virginia (8%), and Washington (38%).

The relatively short period of time that providers had been in their current clinic suggested that the sample might be biased in this regard. In order to evaluate provider turnover rates, each

clinic was contacted after the client and provider data had been collected (approximately 18 months after the first providers were enrolled in the study). At that time, only 22 of the 58 providers (38%), who participated in the study, were still practicing in the same clinic. In all nine clinics, the clinic chiefs and head nurse/administrators were new. These data indicated that the turnover rate of the providers in the study was representative of the population.

Clients. In order to insure that clients were providing information on a specific recent experience with the health care system, they were recruited immediately following a visit to a provider who had volunteered to participate in the study. Clients were recruited by the investigators, during the day, evening, and weekend hours. They were recruited without regard to gender, ethnoculture, symptoms, comorbid condition, Department of Defense component (Army, Air Force, Marines, Navy), or eligibility category (active duty, retired, family member). They were excluded from participation in the study if they were visiting the clinic solely for a physical examination or for an obstetric appointment, because this would preclude the unbiased measurement of changes in health status. They were also excluded if they were less than 18 years old or could not provide written informed consent.

Intentional oversampling identified a pool of 440 eligible clients. From this pool , 226 useable questionnaires were collected. That sample size was 100% of the number needed to represent a typical day's census of clients meeting the study criteria and was a return rate of 51% of those eligible. Thus, the "return rates" in this study were comparable to those achieved in the most recent Department of Defense Survey of Health Related Behaviors Among Military Personnel (Bray, 1995). As a result of this procedure, the sample was a very diverse group of clients. Their age ranged from 19 to 82, with an average age of 43. African-Americans constituted 16% of the sample, Hispanic-Americans 6%, Asian-Americans 3%, and Caucasian-Americans 67%. The remaining clients came from a variety of nations including Afghanistan, Pacific-Islands, Guam, and Germany. Females made up 72% of the sample. Educational backgrounds ranged from those who did not complete high school (3%) to those who had earned doctorates (1%). Over 30% of the sample had earned a four year college degree or higher. A substantial number of clients (5%) failed to answer the question about total household income. Among those who did answer, income ranged from "$20,000 or less" to "$101,000 or more," with 53% making $40,000 or less. Four beneficiary categories were represented in the sample: active duty service members made up 20% of the sample; adult family members of active duty service members 39%; retired service members 17%; and adult family members of retired service members 24%. On average, clients had been obtaining their medical care from military treatment facilities for 20.4 years, but levels of experience ranged from 1 to 57 years. Only 15% of the sample had five or less years experience with the military health care system. However, 40% of

the sample had a year or less experience with their current clinic; only 10% of the sample had ten or more years experience with their current clinic. Clients from North Carolina made up 25% of the sample of 226 clients, while 36% were from Virginia, and 39% were from Washington.

Attrition

The analysis of the reliability and validity of the questionnaires was done on the full samples of providers (N = 58) and clients (N = 226). Of the 226 clients who returned completed questionnaires, 218 (96%) saw providers who also returned completed questionnaires. These 218 clients made up the sample that was used to analyze the impact of provider practice style on client health and satisfaction on the day of their visit to their primary care clinic. Of those 218 clients, 167 (77%) returned completed questionnaires at six months. These 167 clients made up the sample that was used to analyze the impact of provider practice style on client health and satisfaction six months after the day of their visit to their primary care clinic.

Data Collection Procedures

Study Announcement. In order to make potential clients and providers aware of the general nature of the Primary Care Demonstration Project, an announcement was published in the post paper at each site. Posters and brochures advertising the participation of local clinics in the project were placed at each site. These materials were intended to establish credibility and familiarity for the project. Specific clinics and study dates were not mentioned in the materials in order to minimize client and provider self-selection as a source of sampling bias.

Provider Recruitment. Providers were recruited over a five month period. Providers were sent a fact sheet describing the purpose of the study before the beginning of the study. At the beginning of the study, the providers were mailed a Volunteer Agreement Affidavit (VAA) and a packet of questionnaires and were asked to call the investigators if they wanted to participate in the study. The VAA was completed and witnessed using a standard telephonic consent procedure. Those providers who volunteered were assigned a subject identification code and asked to complete the questionnaires. Providers completed a single packet of questionnaires which included a demographics questionnaire and six practice style questionnaires (see Appendix A). The practice style questionnaires measured practice model, confidence, autonomy, collaboration practices, attitudes towards giving information, and job satisfaction. Providers returned the completed packet of questionnaires directly to an investigator or mailed them in a self-addressed envelope to the investigators. Those providers who did not volunteer were asked

to return the blank questionnaires as an indication that they did not wish to participate. Because provider participation was a prerequisite for recruitment of clients, the volunteer status of the provider may have been inferred by some clinic staff and clients.

Client Recruitment. Clients were recruited over an eight month period. Adult, non-obstetric, and non-pediatric clients were screened by an investigator to determine whether they were seeing a participating provider. Once the client had completed the visit with the provider, one of the investigators asked the client to listen to a briefing about the purpose of the study and the VAA form. Following the investigator's brief, questions were answered about the study requirements and the client was asked to volunteer for the study. Those clients who volunteered for the study were assigned a subject identification code, which was written on the VAA, along with their provider's identification code. Clients signed the VAA and were given a copy for their records. They were given two questionnaire packets at that time, with instructions to complete one on the same day of the visit and the other one week later (see Appendix A). The first packet contained demographics and symptoms questionnaires and four outcome questionnaires: functional status, health status, attitudes towards seeking information, and satisfaction with healthcare services. The second packet contained functional status and health status questionnaires, along with a follow-up symptom questionnaire. Care was taken to insure that as clients left the briefing area they were treated in the same manner, regardless of whether they volunteered. Providers, clinic staff, and other clients were not told which clients volunteered, in order to protect client anonymity.

Clients completed questionnaires in the clinic or at home, according to their preference. One week after the questionnaire packet should have been returned, a reminder notice was sent to clients who had not returned the packet. Early in the course of the study, clients were given a self-addressed envelope to use to return the questionnaires to the investigators via military mail. However, it became readily apparent that the military mail system was not delivering the mail in a timely fashion. Midway through the study this procedure was changed. From that point on, clients were given a stamped, self-addressed envelope to use to return the questionnaires to the investigators via the United States Postal Service.

At the six-month timepoint, a third questionnaire packet was sent to the clients along with a stamped, self-addressed envelope. This third packet contained the functional status, health status, information seeking, and client satisfaction questionnaires, along with a follow-up symptom questionnaire. One week after the due date of the questionnaire packet, a reminder letter was sent to clients who had not returned the packet.

Subject Identification. Because client follow-up and medical records review were key to the purpose of the study, clients were asked to provide name, social security number, address, and telephone number on the VAA Form (see Appendix B). Each VAA (both provider and client) had a six-digit number at the top of the form. This code was the subject identification number. This number was used on all questionnaires and data records in the study.

Client Medical Records Audit. The client's medical records were reviewed to determine the client complaint, the final diagnosis, how many visits were made related to the initial complaint, the severity of the illness, the nature of the illness (acute or chronic), how many different primary care providers and specialist were seen for the complaint (between the initial complaint and the six month follow-up), and number of missed appointments (see Appendix A). One registered nurse investigator reviewed all client medical records at all three sites. Prior to arriving at a study site, the investigator requested client medical records from each outpatient medical records office. Care was taken to preserve the confidentiality and integrity of the records. Records were not photocopied. The record was reviewed in the medical records department and only specific items of information were transferred to the medical records review form. Medical records review was completed for 77 clients.

Clinic Characteristics. Organizational information on clinic type was collected in interviews with clinic administrators (e. g., total number of providers, number of support staff, availability of laboratory/pharmacy/radiology services, referral policies, scope of practice policies, etc.). Two key variables emerged which differentiated clinics. The first was the differences among clinics in the type of clients seen and the second was the ratio of non-physician providers to physicians working in the clinic. Clinics were divided into three types on the basis of these two variables.

Four of the nine clinics in the study were Type I clinics. A Type I clinic saw predominantly active duty clients in a Troop Medical Clinic setting, but also provided care to family members of active duty personnel. These clinics rarely or never treated retirees or their family members. In these four clinics there were 34 non-physician providers and 19 physicians, thus, Type I clinics used a non-physician provider to physician ratio of 2:1.

Three of the nine clinics in the study were Type II clinics. A Type II clinic saw family members of active duty personnel, as well as retirees and their family members. Active duty personnel were not seen in these clinics. In these three clinics there were 15 non-physician providers and 23 physicians, thus, overall, Type II clinics used a non-physician provider to physician ratio of 1:1.5. However, there was a lot of variability across these clinics; one clinic practiced at a 1:3 ratio, another at a 1:2 ratio and the other at a 2:1 ratio.

Two of the nine clinics in the study were Type III clinics. A Type III clinic saw a significant number of clients from each of the four beneficiary categories. In these two clinics there were 8 non-physician providers and 15 physicians, thus, Type I clinics used a non-physician provider to physician ratio of 1:2.

Limitations

The analysis of data and the recommendations derived from this study were limited in scope in recognition of the correlational design used. The factors which limit the degree to which generalizations can be made from this study are described in the following paragraphs.

No study which relies solely on volunteers to study sensitive behaviors in a longitudinal design can claim to have a truly unbiased or "random" sample. A substantial number of clients will not volunteer for such studies, because they do not believe that their confidences will be adequately protected. However, obtaining informed consent from volunteers was the only ethical alternative available at the time.

Like most studies of attitudes and perceptions, this study relied on self-report questionnaire data. Although this was the most direct method of measuring several critical variables which were uniquely ones of self-assessment, such as symptom severity and job satisfaction, a broader perspective would have been obtained, if more objective observer assessments, medical record, or cost data had been available.

As described on p. 9-5, sites for the study were purposely chosen to provide the most diverse sample. However, this necessitated using clinics associated with Medical Centers, whose similarity to clinics from small medical treatment facilities is unknown.

This study was a naturalistic observation of the situation existing in the clinics (in 1995-1996). No attempt was made to "manipulate" clinic characteristics, such as types of clients being seen, ratio of non-physician providers to physician providers, or client access to provider by type (physician or non-physician provider). By virtue of the fact that only clinics which had non-physician providers were enrolled in the study, non-physician providers were sampled at a higher rate than physician providers (e.g., the nurse practitioner sample was an approximately 15% sample of all primary care nurse practitioners in the Army, as of September 30, 1995). However, their clients were not oversampled. Providers had an average of four clients enrolled in the study; client enrollment was completed without regard for the "type" of provider seen.

The majority of clients in the sample were female. Although this is representative of the population using the Army's primary care clinics, it precluded any analysis of gender differences in outcomes.

Several different rationales for choosing sample size and methods for reducing sampling bias were used, thus the size of the samples was "statistically" appropriate (was representative and provided sufficient power for statistical analysis). However, the 50% "participation rate" by eligible providers and clients and the small sample size (relative to all possible providers and clients), while typical of demonstration projects and pilot studies, precluded drawing conclusions about prevalence. It is worth noting that attributes of the military organizational system, which are a direct result of the mission, impede efficient sampling strategies. Changes to clinic schedules were made with less than 48 hours notice to accommodate field exercises, extra duties, continuing education opportunities, impromptu, but mandatory training, training holidays, temporary reassignments, no-notice permanent reassignments, and specialty clinic days (e.g., well-baby checkups, well-woman exams, etc.).

There was 23% attrition from the client sample by the time of the six month data collection. There was a 66% attrition of medical records over the eight month data collection period. Records were with the client, with a provider, transferred in a clinic reorganization, forwarded to a new temporary or permanent duty station, archived as inactive, or simply missing. Available records were often unaccountably incomplete. Accordingly, major findings and recommendations presented in this Executive Summary are based entirely on the data collected from clients on the day of the visit and one week later.

Finally, although reminders appear throughout this summary and the report, it is appropriate to state it here, as well. Although primary care clinics in the Army spend a substantial amount of their resources on pediatric and obstetric care, the conclusions and recommendations from this study apply only to adult, non-obstetric, primary care services provided in Army primary care clinics (variously referred to in the Army as "troop medical clinics," "family care clinics," "adult primary care clinics," etc.). No application to inpatient services, to other types of outpatient clinics, or to pediatric or obstetric care in primary care clinics is implied or should be inferred.

## Reliability and Validity Assessment

### Analytical Approach

#### Data Reduction and Analysis Procedures

Two investigators checked every item on every questionnaire for response errors (such as circling more than one answer) and then numerically coded fill-in-the-blank answers. Data from checked and coded questionnaires were entered onto an electronic medium using a 100% double-entry, double-verification procedure. Data manipulation, analyses, and graphical representation were done using a SPARC 5 workstation implemented in a Solaris (v2.5)

environment on a SUN computer with statistical subroutines from SAS/STAT (v6.11) software or a Windows95 Pentium desktop computer with Microsoft Excel.

Each of the major variables of this study was measured via a separate questionnaire. Although subjects were given the questionnaires as a "packet" of questionnaires with a similar format (see Appendix A), care was taken to make it clear that each questionnaire dealt with a different issue. Each questionnaire had its own set of instructions and rating scale. Thus, a separate reliability and validity assessment was done for each questionnaire.

Reliability

A Cronbach alpha coefficient was calculated for each of the questionnaires to determine the level of internal consistency. An alpha of 0.80 or higher was considered to be sufficient evidence of reliability. Health outcome questionnaires, which were administered twice within a one-week period, were also analyzed for test-retest reliability using a Pearson correlation coefficient. A correlation of 0.70 or higher was considered to be sufficient evidence of test-retest reliability. The lower standard was chosen because questionnaires designed to assess health outcomes in samples of clients seeking care for an acute illness must balance the trade-off between sensitivity and reliability. They must be sensitive to changes in status, but must be reliable enough to make an assessment of validity possible.

Factor Structure

A common factor analysis was done on each questionnaire to evaluate its construct validity (Cronbach, 1984; Goodwin & Goodwin, 1991; Nunnally, 1978). Three conditions were considered when choosing the most appropriate number of factors: major discontinuities in the scree plot, eigenvalues (greater than 1.00), and cumulative percentage of variance accounted for (70% or more) in questionnaire scores (Cattell, 1966; Horn & Engstrom, 1979). A "varimax" rotation for orthogonal factors was used to assist in interpreting the factors, when more than one factor was extracted. Unless otherwise indicated, items that had a primary factor loading of 0.50 or higher and secondary factor loadings no greater than 0.35 were included in the interpretation of the primary factor.

Validity

The "concurrent tests" technique was used to compile evidence of the criterion validity of questionnaires. Criterion validity was defined as a high correlation between a questionnaire and another measure that was widely accepted as defining the construct (Cronbach, 1984; Goodwin & Goodwin, 1991; Nunnally, 1978). In the absence of such a "gold standard," validity was demonstrated by a high correlation between the questionnaire and another measure to which it,

theoretically, should be related (Atwood & Hinshaw, 1993; Goodwin & Goodwin, 1991; Lowe & Ryan-Wenger, 1992 & 1993) or by a near zero correlation between the questionnaire and another measure to which it, theoretically, should be unrelated. Pearson correlations among theoretically similar measures were accepted as evidence of validity when they were $\pm$0.80 or higher. Pearson correlations among theoretically dissimilar measures were accepted as evidence of validity when they were $\pm$ 0.30 or lower.

The "known groups" technique was also used to compile evidence of the criterion validity of questionnaires (Cronbach, 1984; Goodwin & Goodwin, 1991; Nunnally, 1978). Criterion validity was defined, in this case, as a significant difference among groups on a variable on which, theoretically, groups should differ. Analyses of variance were computed with an alpha level of 0.05. Pairwise comparisons of means were made using Tukey's least significant difference (LSD) test or a least squares means test with alpha levels set at 0.05. A general power analysis was calculated. Using the method described in Cohen (1977), the client sample size in this study provided a power of 0.90 to detect differences among means when comparing three groups using a one way analysis of variance test ($f = 0.25$, $n = 72$, $\alpha = 0.05$, $u = 2$). The provider sample size provided a power of 0.90 to detect differences among means in a one way analysis of variance comparing three groups ($f = 0.50$, $n = 19$, $\alpha = 0.05$, $u = 2$).

## Overview

All of the practice style and outcome questionnaires used in the study were developed from questionnaires that had been used with some success in other settings (Beaufait, et al., 1992; Dempster, 1990 & 1991; Hays, Sherbourne, & Mazel, 1993; Hopkins, 1986; Kravitz, Thomas, Sloss, & Hose, 1993; Mangelsdorff, 1994; Mangelsdorff, Twist, Zucker, Ware, & George, 1992; Stichler, 1990 & 1992; Thibodeau & Hawkins, 1994). Detailed descriptions of how they were modified to meet the needs of this study are provided in the following sections, along with information on their reliability, factor structure, and validity. Copies of the modified questionnaires are provided in Appendix A. Tables 9-1 and 9-2 provide an overview of the results.

## Table 9-1

## Overview of Reliability and Validity Results

| Original Questionnaire | Current Questionnaire | | | | | | |
|---|---|---|---|---|---|---|---|
| | Construct | Changes made to Original Questionnaire | Internal Consistency | One-week Test-Retest Reliability | Factor Structure | Concurrent Validity | Known Groups Validity |
| Beaufait et al. (1992) | Functional Status | minor | good | good | new | excellent | excellent |
| Hays et al. (1995) | Health Status | substantial | excellent | good | as expected | excellent | excellent |
| Mangelsdorff et al. (1992) | Satisfaction (Client) | moderate | excellent | -- | as expected | excellent | excellent |
| Hopkins (1986) | Information Seeking | substantial | good | -- | new | good | good |
| Thibodeau & Hawkins (1994) | Practice Model | substantial | good | -- | new | -- | excellent |
| Thibodeau & Hawkins (1994) | Confidence in Skills | substantial | excellent | -- | as expected | -- | excellent |
| Dempster (1990) | Autonomy | moderate | good | -- | as expected | -- | excellent |
| Stichler (1990) | Collaboration | moderate | excellent | -- | as expected | -- | excellent |
| new | Information Giving | -- | good | -- | new | -- | excellent |
| Kravitz et al. (1993) | Satisfaction (Provider) | moderate | excellent | -- | as expected | -- | excellent |

**Table 9-2**

**Overview of Factor Analysis Results**

| Questionnaire | Number of Items | Cronbach alpha | Number of Factors |
|---|---|---|---|
| Functional Status | 9 | 0.83 | 1 |
| Health Status | 36 | 0.96 | 2 |
| Satisfaction (Client) | 37 | 0.95 | 2 |
| Information Seeking | 12 | 0.82 | 2 |
| Practice Model | 43 | 0.87 | 4 |
| Confidence in Skills | 64 | 0.98 | 3 |
| Autonomy | 30 | 0.86 | 3 |
| Collaboration | 20 | 0.96 | 1 |
| Information Giving | 16 | 0.88 | 3 |
| Satisfaction (Provider) | 22 | 0.93 | 4 |

Functional Status

The functional status questionnaire was adapted from nine clinical assessment charts developed by the Dartmouth Primary Care Cooperative "COOP" Information Project (Beaufait et al., 1992; Nelson et al., 1990). The charts were chosen because of their good test-retest reliability, well-established construct validity, and the fact that substantial literature was available for comparison of results. A single change was made to each chart. The stem of each chart typically asks the client to rate status during the "past 4 weeks," "past 2 weeks," or "past week" (Beaufait et al., 1992; Kinnersley, Peters, & Stott, 1994; Larson, Hays, & Nelson, 1992; Wasson et al., 1994; Westbury, 1990). In this study, the client was asked to rate status during the "past 24 to 48 hours." This change was made in an effort to increase the specificity of the questionnaire, improve the accuracy of client recall, and facilitate administration of the questionnaire twice within a one-week period. The charts were then printed as a single nine-item questionnaire.

Reliability

It is commonly asserted that each chart in the COOP series serves as a single-item scale and therefore can not be assessed for "internal consistency" (Beaufait et al., 1992; Nelson et al., 1990; Westbury, 1990). However, it is also true that the charts correlate moderately well with

each other and with multi-item subscales from health status questionnaires (Beaufait et al., 1992; Nelson et al., 1987, 1990; Wasson et al., 1992; Wasson, Kairys, Nelson, Kalishman, & Baribeau; 1994). Moreover, Larson et al. (1992) demonstrated that using the charts without pictures made no difference in the data. Thus, there is little operational difference between the charts and a nine-item questionnaire. In this study, the charts were presented as a nine-item functional status questionnaire (with pictures). When used in this way, it is appropriate to assess the internal consistency of the functional status questionnaire. The alpha coefficient for the nine-item questionnaire was 0.83 in the current sample indicating a high degree of internal consistency. This finding is congruent with data collected by Westbury (1990). As shown in Table 9-3, administering the questionnaire in this way did not attenuate the independence of the charts. The inter-item correlations (Pearson) are comparable to those reported by Nelson et al. (1987 & 1990) and Westbury (1990). The one-week test-retest reliability of the questionnaire (total score) was also good, 0.70, considering that the typical client was seeking treatment for an ***acute*** illness. The one-week test-retest reliability for eight of the nine individual charts ranged from 0.55 to 0.77. These findings are comparable to those collected in earlier investigations where test-retest reliability ranged from 0.42 to 0.99 depending on the chart, the length of time between test and retest, and the health of the subject population (Beaufait et al., 1992; Nelson et al., 1990; Wasson et al., 1994). Predictably, the one-week test-retest reliability for the "change in health" chart (item 6) was only 0.09 which supports the hypothesis that the item was appropriately sensitive to changes in functional status. Taken as a whole these findings document an optimal trade-off between reliability and sensitivity for the questionnaire (Kinnersley et al., 1994; Wasson et al., 1992; Westbury, 1990).

**Table 9-3**

**Inter-item Correlations for the Functional Status Questionnaire**

| | Physical Fitness | Feelings | Daily Activities | Social Activities | Pain | Change in Health | Overall Health | Social Support | Quality of Life |
|---|---|---|---|---|---|---|---|---|---|
| Physical Fitness | 1.00 | | | | | | | | |
| Feelings | 0.09 | 1.00 | | | | | | | |
| Daily Activities | 0.45 | 0.36 | 1.00 | | | | | | |
| Social Activities | 0.33 | 0.51 | 0.74 | 1.00 | | | | | |
| Pain | 0.32 | 0.31 | 0.62 | 0.51 | 1.00 | | | | |
| Change in Health | 0.04 | 0.09 | 0.20 | 0.24 | 0.23 | 1.00 | | | |
| Overall Health | 0.44 | 0.28 | 0.52 | 0.51 | 0.51 | 0.24 | 1.00 | | |
| Social Support | 0.20 | 0.31 | 0.19 | 0.27 | 0.19 | 0.11 | 0.34 | 1.00 | |
| Quality of Life | 0.33 | 0.52 | 0.58 | 0.62 | 0.44 | 0.29 | 0.55 | 0.40 | 1.00 |

Factor Structure

Because each chart is assumed to be a single-item scale, the total score on the nine charts is rarely used (Westbury, 1990) and the ***questionnaire*** which is formed by the nine charts has not been subjected to factor analysis. However, in this study, the nine charts were presented as a questionnaire. In the current sample, a single factor accounted for 95% of the variance in the questionnaire. Six of the nine items on the questionnaire had factor loadings of 0.50 or higher on the factor (items 2 - 5, 7, and 9). Predictably, the only item that was clearly unrelated to the total score (factor loading = 0.30) was Item 6, which asked the client to indicate how much his/her health had ***changed.*** The overall pattern of results provided clear evidence that a single construct was being assessed by the functional status questionnaire.

Validity

Both health status and symptom severity have been shown to co-vary with functional status in a number of other studies (Beaufait et al., 1992; Nelson et al., 1987 & 1990; Wasson et al., 1994). Data on health status and symptom severity were collected along with functional status in this study, as well. Total scores on the functional status questionnaire were highly correlated with total scores on a health status questionnaire ($r$ = -0.84).[1] The client's rating of the severity of his/her primary symptom was used to divide the sample of clients into three groups, Low ($n$ = 63),

Moderate ($n$ = 88), and High ($n$ = 75). A one-way analysis of variance indicated that these groups had significantly different total functional status scores, $F$ (2, 223) = 20.8, $p \leq 0.0001$. The Low group had the best functional status and the High group had the worst functional status. Pairwise comparisons of the means showed that all three groups were significantly different from each other ($p \leq 0.01$); i.e., the Low severity group (mean functional status = 19.10) was different from the Moderate severity group (mean = 21.74), which was different from the High severity group (mean = 25.76), which was also different from the Low severity group.

In contrast, functional status should not be systematically and consistently related to client satisfaction (Zapka et al., 1995). All clients, regardless of the severity of their functional symptomology, should be ***satisfied*** that their provider has analyzed their health problem thoroughly and treated it appropriately. In this sample, total functional status scores were poorly related to satisfaction ($r$ = -0.28), accounting for less than 8% of the variance.

The validity of the functional status questionnaire has been consistently good when tested using the "known groups" and "concurrent test" techniques of validity testing (Landgraf, Nelson, Hays, Wasson, & Kirk, 1990), just as it was in this analysis. However, there are more powerful and more systematic ways to establish validity. Several studies (Beaufait et al., 1992; Nelson et al., 1987 & 1990; Wasson et al., 1994) have reported the results of convergent and discriminant validity testing of the COOP charts using the multitrait-multimethod (MTMM) technique (Campbell & Fiske, 1959) to compare measures of functional status and health status. Unfortunately, the MTMM technique was applied rather unconventionally in these studies (Atwood & Hinshaw, 1993; Goodwin & Goodwin, 1991; Lowe & Ryan-Wenger, 1992 & 1993). The MTMM technique requires that a measure of internal consistency (reliability) set the baseline standard for comparison within an intercorrelation matrix. The reliability correlations must be higher than monotrait-heteromethod correlations, which must be higher than the heterotrait-monomethod correlations, which must be higher than the heterotrait-heteromethod correlations, in order to establish both convergent and discriminant validity (Campbell & Fiske, 1959). Studies of the COOP charts used the identity diagonal (the 1.00 correlation of each variable with itself) in the MTMM intercorrelation matrix, instead of a coefficient of internal consistency. No doubt this was done because a measure of internal consistency can't be computed on a single chart measure. However, test-retest reliability coefficients could have been substituted for internal consistency coefficients on the single chart measures. Certainly, the internal consistency coefficients could have been used for the multi-item questionnaires used in the MTMM comparison. More importantly, studies of the COOP charts cited average correlations among the monotrait-heteromethod correlations as evidence of

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[1] The negative correlation is simply a function of the different rating scales used. On the functional status scale 1 signified no deficit in function and 5 a severe deficit, while on the health status scale 1 signified poor health and 5 excellent health.

convergent validity and average correlations on the heterotrait-heteromethod correlations as evidence of discriminant validity. The MTMM technique requires a comparison of the ***individual*** correlations to determine convergent and discriminant validity (Campbell & Fiske, 1959). A review of the intercorrelation tables provided by Nelson et al. (1987 & 1990) and Wasson et al. (1994) reveals that the pattern of correlations for several key comparisons did not support convergent and discriminant validity. It is unclear whether it was true because (a) the MTMM technique is not appropriate for single-item measures, (b) the variable health status is too closely related to functional status to be used as a basis of comparison in the MTMM test, or (c) the chart method and the questionnaire method are too closely related to be used as a basis of comparison in the MTMM test.

In the current study, the COOP charts were used as a nine-item functional status questionnaire (with pictures) and presented in conjunction with a traditional health status questionnaire (without pictures). In an effort to provide more information on the convergent and discriminant validity of the functional status questionnaire, a MTMM analysis was performed on the data collected in this study. Each questionnaire was divided into two subscales, one measuring a physical dimension of health and one measuring a psychosocial dimension. Responses to items 1, 3, 5, and 7 of the functional status questionnaire were summed to provide a Physical score and responses to items 2, 4, 8, and 9 were summed to provide a Psychosocial score. They were compared to a 16-item Physical subscale score and a 14-item Psychosocial subscale score from the health status questionnaire. Table 9-4 shows the MTMM matrix of Cronbach alpha and Pearson correlations derived from the data. Two facts are obvious: (a) the four-item functional status subscales were too short to produce adequate internal consistency coefficients, and (b) when measured as they were in this study, the physical and psychosocial dimensions were not sufficiently different on either method ($\underline{r}$ = 0.61 and 0.52) to form the basis of a MTMM analysis.

**Table 9-4**

**Multitrait-Multimethod Correlation Matrix**

| | | Charts | | Questionnaire | |
|---|---|---|---|---|---|
| | | Physical | Psychosocial | Physical | Psychosocial |
| Charts | Physical | (0.78) | | | |
| | Psychosocial | 0.61 | (0.73) | | |
| Questionnaire | Physical | -0.78 | -0.50 | (0.96) | |
| | Psychosocial | -0.51 | -0.75 | 0.52 | (0.93) |

Cronbach's alpha coefficients of reliability (internal consistency) are presented in parentheses along the diagonal. Inter-subscale correlations (Pearson) are shown in the matrix. Negative correlations are an artifact of the reversed rating scales used on the charts (1 to 5) versus the questionnaires (5 to 1).

Summary

The COOP charts have been shown to be effective clinical screening and research tools. There is good evidence from this and previous studies that the charts are reliable and valid when used individually, graphed as a profile, or summed to yield a total score. These results, taken as a whole, provide clear evidence that the functional status questionnaire had good reliability and validity in a primary care setting. The results of the current MTMM analysis do not negate the convincing body of literature on the validity of the COOP charts. They do confirm that the MTMM technique for analyzing validity is simply not appropriate for brief or single-item self-report measures or in cases where the variables and methods being compared are operationally similar (Campbell & Fiske, 1959).

## Health Status

The health status questionnaire was adapted from the "RAND 36-Item Health Survey 1.0" (Hays et al., 1993; Hays, Sherbourne, & Mazel, 1995). The questionnaire was chosen because of its well-documented reliability and validity and the availability of published literature on its uses. Five types of changes were made to the questionnaire in order to reduce the response burden of the clients and to improve the psychometric properties of the questionnaire (when used in this study).

(1) The format of the questionnaire was modified to enhance uniformity across the different questionnaires administered to clients (see Appendix A).

(2) A five-point rating scale was substituted for the two-point, three-point, or six-point scales used on some items. That is, a five-point scale was used for all 36 items on the new version of the questionnaire. Concise anchors were used for the rating scales, although care was taken to maintain the concept of the original item (see Tables 9-5 and 9-6 for examples). Consistent use of five-point continuous scales across items within a questionnaire was designed to increase the questionnaire's sensitivity and applicability (Hays et al., 1995; Pascoe, 1983). Hays et al. (1993) recommended that researchers recode responses to each item on the RAND survey to point values ranging from 0 to 100. Consistent use of a five-point continuous scale eliminated the need for recoding responses before scoring the questionnaire. The new questionnaire was scored by simply summing responses across items (after reversing responses on items 24, 25, 28, 29, 31-33, and 35; see Appendix A).

(3) Items were written more succinctly (Table 9-6).

(4) Items from different subsections of the scale were modified to increase parallelism. For example, on the RAND survey, items 13 and 14 from the physical health subsection were parallel to items 17 and 18 from the emotional problems subsection. However, items 15 and 16 had no parallel (Table 9-5). In the new version, item 16 was parallel to item 19 (Table 9-6). The total number of items was still 36.

(5) Items on the RAND survey required clients to rate their status during the "past 4 weeks." On the new questionnaire, the client was asked to rate his/her status during the "last 24 to 48 hours." This change was made in an effort to increase the specificity of the questionnaire, improve the accuracy of client recall, and facilitate administration of the questionnaire twice within a one-week period.

**Table 9-5**

**Examples from the Original Health Status Questionnaire**

| **Items from RAND 36 v 1.0** | | |
|---|---|---|
| 1. In general, would you say your health is: | | |
| | Excellent | 1 |
| | Very good | 2 |
| | Good | 3 |
| | Fair | 4 |
| | Poor | 5 |
| 2. Compared to one year ago, how would you rate your health in general now? | | |
| | Much better now than one year ago | 1 |
| | Somewhat better now than one year ago | 2 |
| | About the same | 3 |
| | Somewhat worse now than one year ago | 4 |
| | Much worse now than one year ago | 5 |

| During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health? | Yes | No |
|---|---|---|
| 13. Cut down the amount of time you spent on work or other activities | 1 | 2 |
| 14. Accomplished less than you would like | 1 | 2 |
| 15. Were limited in the kind of work or other activities | 1 | 2 |
| 16. Had difficulty performing the work or other activities (for example, it took extra effort) | 1 | 2 |

| During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? | Yes | No |
|---|---|---|
| 17. Cut down the amount of time you spent on work or other activities | 1 | 2 |
| 18. Accomplished less than you would like | 1 | 2 |
| 19. Didn't do work or other activities as carefully as usual | 1 | 2 |

**Table 9-6**

**Examples from the New Health Status Questionnaire**

| **Items from new Health Status Questionnaire** | | | | | |
|---|---|---|---|---|---|
| | Poor | Fair | Adequate | Very Good | Excellent |
| 1. In general, my health is: | 1 | 2 | 3 | 4 | 5 |
| | Much Worse | Some-what Worse | the Same | Some-what Better | Much Better |
| 2. Compared to six months ago, my health now is generally: | 1 | 2 | 3 | 4 | 5 |
| In the last 24 to 48 hours has your ... | Extremely Limited | Limited Quite a Bit | Mod-erately Limited | Slightly Limited | Not Limited |
| 13. physical health reduced the amount of time you could spend on work or other activities? | 1 | 2 | 3 | 4 | 5 |
| 14. physical health prevented you from accomplishing everything you wanted to do? | 1 | 2 | 3 | 4 | 5 |
| 15. physical health changed the kind of work you could do? | 1 | 2 | 3 | 4 | 5 |
| 16. physical health made it difficult to perform work or other activities (for example, the activity took extra effort)? | 1 | 2 | 3 | 4 | 5 |
| In the last 24 to 48 hours have your ... | Extremely Limited | Limited Quite a Bit | Mod-erately Limited | Slightly Limited | Not Limited |
| 17. emotional problems reduced the amount of time you could spend on work or other activities? | 1 | 2 | 3 | 4 | 5 |
| 18. emotional problems prevented you from accomplishing everything you wanted to do? | 1 | 2 | 3 | 4 | 5 |
| 19. emotional problems made it difficult to perform work or other activities (for example, the activity took extra effort)? | 1 | 2 | 3 | 4 | 5 |

Reliability

The new 36-item questionnaire showed excellent internal consistency with an alpha coefficient of 0.96. It also showed adequate one-week test-retest reliability, $r = 0.83$, given that the typical client visited the clinic for an ***acute*** illness. These figures are comparable to those reported in earlier investigations (Hadorn & Hays, 1991; Hays et al., 1995; Hays & Stewart, 1990; Stewart, Hays, & Ware, 1988). Hays et al. (1995) reported that the lowest alpha coefficient for any of the subscales making up the RAND 36-Item Health Survey 1.0 was 0.78.

Factor Structure

Two factors accounted for 74% of the variance in this questionnaire. The scree plot suggested that little information would be gained by considering more than two factors. The first factor included ten items (Table 9-7). None of these items had factor loadings on the second factor that exceeded 0.15. It is clear from the data shown in Table 9-7 that these items assessed functional behaviors associated with physical health.

**Table 9-7**

**Health Status Items Comprising Factor 1: Functional Behavior**

| Item | How much are you currently limited in ... | Loading |
|---|---|---|
| 10. | walking several blocks? | 0.89 |
| 9. | walking more than a mile? | 0.87 |
| 5. | lifting or carrying groceries? | 0.87 |
| 7. | climbing one flight of stairs? | 0.86 |
| 4. | moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf? | 0.86 |
| 6. | climbing several flights of stairs? | 0.86 |
| 11. | walking one block? | 0.84 |
| 8. | bending, kneeling, or stooping? | 0.78 |
| 3. | vigorous activities, such as running, lifting heavy objects, participating in strenuous sports? | 0.70 |
| 12. | bathing or dressing yourself? | 0.60 |

The second factor was also composed of ten items, all of which dealt with affective behaviors associated with emotional health (Table 9-8). None of the items had factor loadings on the first factor that exceeded 0.30. In SAS/STAT (v6.11), the "varimax" rotation used in the factor analysis of the questionnaire yields factors which are uncorrelated. Thus, clients clearly separated physical health from emotional health. These findings support the assertion that this questionnaire comprehensively assesses the general construct of health status. It measures in an independent manner two readily identifiable dimensions of the general construct, health status.

**Table 9-8**

**Health Status Items Comprising Factor 2: Affective Behavior**

| Item | In the last 24 to 48 hours have your/you ... | Loading |
|---|---|---|
| 19. | emotional problems made it difficult to perform work or other activities (for example, the activity took extra effort)? | 0.84 |
| 18. | emotional problems prevented you from accomplishing everything you wanted to do? | 0.83 |
| 17. | emotional problems reduced the amount of time you could spend on work or other activities? | 0.82 |
| 28. | felt downhearted and blue? | 0.77 |
| 25. | felt so down in the dumps that nothing could cheer you up? | 0.71 |
| 26. | felt calm and peaceful? | 0.67 |
| 24. | been a very nervous person? | 0.65 |
| 30. | been a happy person? | 0.65 |
| 29. | felt worn out? | 0.58 |
| 31. | felt tired? | 0.54 |

The result of this factor analysis was very similar to the two factor solution attained by Hays et al. (1995) when analyzing the core items and subscales used to develop the original RAND survey (see also Hays & Stewart, 1990). This was true in spite of the changes to the survey made in this study and the very different assumptions used in the analyses (i.e., orthogonal factor rotation was used in this analysis, while oblique factor rotation was used with the RAND survey). This iterative approach to validation provides a very strong endorsement for the core items.

Although the factor analysis yielded a meaningful two factor solution congruent with earlier investigations, 16 of the 36 items on the survey loaded well on both the functional and affective behavior scales. On the surface, this overlap would suggest that the 36 item questionnaire could be reduced in length. However, validation studies of the core items used to develop the RAND survey suggested that these "general health" items increased the sensitivity and applicability of the questionnaire. These items contribute to the ability of the questionnaire to distinguish among subpopulations: inpatients versus outpatients, clients with gastrointestinal disorders versus those with hypertension, clients suffering from depression versus those suffering from heart disease or diabetes, etc. (Hays et al., 1995).

Validity

Both functional status and symptom severity have been shown to co-vary with health status (Hays et al., 1995). Data on functional status and symptom severity were collected along with health status in this study, as well. Total scores on the health status questionnaire were highly correlated with total scores on a functional status questionnaire

($r$ = -0.84).[2] The client's rating of the severity of his/her primary symptom was used to divide the sample of clients into three groups, Low ($n$ = 63), Moderate ($n$ = 88), and High ($n$ = 75). A one-way analysis of variance indicated that these groups had significantly different total health status scores, $F$ (2, 212) = 17.77, $p \leq 0.0001$. The Low severity group had the best health status and the High severity group had the worst health status. Pairwise comparisons of the means showed that the Low and High groups were significantly different from each other (mean health status = 150.85 and 127.49, respectively, $p$ = 0.0001), as were the Moderate and High groups (mean for Moderate group = 143.49, $p$ = 0.0001). However, the Low and Moderate groups were not significantly different from each other ($p$ = .06).

In contrast, health status should not be systematically and consistently related to client satisfaction (Zapka et al., 1995). All clients, regardless of the severity of their health status, should be ***satisfied*** that their provider has analyzed their health problem thoroughly and treated it appropriately. In this sample, total health status scores were poorly related to satisfaction ($r$ = 0.20), accounting for only 4% of the variance.

As discussed in the previous section on the functional status questionnaire, an MTMM analysis of the physical and psychosocial subscales of the health status and functional status questionnaires was performed in an attempt to gather evidence on the convergent and divergent validity of the questionnaires. The four-item subscales of the functional status questionnaire were too short to produce adequate internal consistency coefficients and the physical and psychosocial dimensions were not sufficiently different on either questionnaire to form the basis of a conventional MTMM analysis (see Table 9-4).

Summary

These results, taken as a whole, provide clear evidence that the new health status questionnaire had good reliability and validity in a primary care setting. Its internal consistency was quite high. Its test-retest reliability reflected an appropriate trade-off between sensitivity and stability. Its factor structure and known groups validity were consistent with the existing body of literature, indicating that the changes made to the questionnaire did not impair its validity.

[2] The negative correlation is simply a function of the different rating scales used. On the functional status scale 1 signified no deficit in function and 5 a severe deficit, while on the health status scale 1 signified poor health and 5 excellent health.

## Satisfaction with Healthcare Services

The satisfaction questionnaire was adapted from a 60-item questionnaire developed by Mangelsdorff et al. (1992). The questionnaire was chosen because of its high internal consistency, its relevance to beneficiaries of the military health care system, and the published data available for comparison of results. Five changes were made to the questionnaire.

(1) Only items 1 through 32 were used. The topic of each of these items was retained as was the order in which the items were presented. Items 33 - 60 were deleted because they dealt with utilization and demographic data that were not relevant to this study.

(2) Five items were added to the questionnaire to expand the assessment of provider communication behaviors. These items became items 33 - 37 of the new questionnaire.

(3) Eight items on the original questionnaire used the word "doctor" or the phrase "doctor and medical staff." The word "provider" was substituted for both the word and the phrase. The substitution was made to insure that clients were rating their health care provider whether it was a doctor, nurse practitioner, or physician assistant. "Provider" was defined in the questionnaire instructions to insure that clients were familiar with the term. The substitution also eliminated ambiguity about who was being rated, the provider or the staff. Similarly, two items used the phrase "doctor's office." The word "clinic" was substituted.

(4) The original questionnaire used a six-point rating scale with the anchors, "Poor, Fair, Good, Very Good, Excellent, and Have Not Used" on items 3-32. On items 1 and 2 it used "Strongly Disagree to Strongly Agree" anchors. The new version of the questionnaire used the anchors, "Not Applicable, Never Satisfied, Sometimes Satisfied, Usually Satisfied, Satisfied Most of the Time, and Always Satisfied" for all 37 items. This change was made in an effort to increase the sensitivity of the questionnaire. The change was designed to focus the attention of the client on the issue of satisfaction by asking clients to rate their satisfaction with a service, rather than to judge its excellence.

(5) Items 1, 2, and 10 were rephrased to be more appropriate to the new rating scale.

### Reliability

The new 37-item questionnaire showed excellent internal consistency with an alpha coefficient of 0.95. This finding is congruent with data reported by Mangelsdorff et al. (1992) who reported alpha coefficients ranging from 0.90 to 0.95.

### Factor Structure

Two factors accounted for 72% of the variance in the questionnaire. Although five factors had eigenvalues greater than 1.0, the scree plot suggested that little information would be gained

by considering more than two factors. The result of this factor analysis was similar to that performed by Mangelsdorff et al. (1992) and Mangelsdorff (1994). This was somewhat surprising considering the greater homogeneity of the current sample and the changes that were made to the questionnaire. Mangelsdorff et al. (1992) found four factors with eigenvalues greater than 1.0 in the sample of clients using military medical treatment facilities. Those four factors accounted for 68% of the variance in total scores.

The first factor extracted during analysis of the current sample included 23 of the 37 items on the questionnaire and accounted for 65% of the variance. All 23 of the items had a factor loading of 0.50 or higher and none had factor loadings on the other factor that exceeded 0.35. The dozen items with the highest factor loadings on the first factor are shown in Table 9-9 to illustrate the nature of this factor (see Appendix A). It is clear from these data that the provider's practice style (both interpersonal and technical) had the most influence on the overall satisfaction of the clients in this study. The second factor was composed of six items, all of which dealt with issues of choice and access (Table 9-10). None of the items had a factor loading on the first factor that exceeded 0.35. In the current sample, these items were among those most negatively rated and most often rated as "not applicable," a finding consistent with data from a variety of investigations (Mangelsdorff, 1994; Mangelsdorff et al., 1992; Murray, 1987; Pascoe, 1983). This consistency gives additional support for the construct validity of the questionnaire.

**Table 9-9**

**Top 12 Satisfaction Items[a] Comprising Factor 1: Provider Practice Style**

| Item | How satisfied are you with the ... | Loading |
|---|---|---|
| 32. | overall quality of care and services? | 0.85 |
| 33. | way the provider listens to your concerns? | 0.83 |
| 18. | thoroughness of treatment? | 0.80 |
| 36. | provider's answers to your questions? | 0.79 |
| 20. | attention given to what you have to say? | 0.78 |
| 17. | skill, experience, and training of providers? | 0.78 |
| 30. | amount of time you have with your provider during a visit? | 0.78 |
| 27. | respect shown to you and attention to your privacy? | 0.78 |
| 26. | personal interest in you and your medical problems? | 0.78 |
| 25. | friendliness and courtesy shown to you by your provider? | 0.78 |
| 34. | provider's explanation of your condition (uses language you can understand)? | 0.77 |
| 1. | health care you receive in this clinic? | 0.75 |

[a]Items 2, 8, 9, 10, 12, 16, 19, 28, 29, 31, and 35 had factor loadings ranging from 0.50 to 0.75.

**Table 9-10**

**Satisfaction Items Comprising Factor 2: Choice and Access**

| Item | How satisfied are you with the ... | Loading |
|---|---|---|
| 24. | ease of seeing the provider of your choice? | 0.66 |
| 23. | arrangements for choosing a personal provider? | 0.63 |
| 5. | access to specialty care if you need it? | 0.55 |
| 6. | access to hospital care if you need it? | 0.52 |
| 22. | number of providers you have to choose from? | 0.51 |
| 14. | protection you have against hardship due to medical expenses? | 0.50 |

It should be stressed that these two factors are independent of each other. In SAS/STAT (v6.11), the "varimax" rotation yields factors which are uncorrelated. Thus, clients clearly separated issues of quality of care from those of access to care. The overall pattern of results did not suggest that two different constructs were being measured, rather it suggested that this questionnaire was measuring satisfaction with two discernibly different aspects of health care.

There were eight items on the questionnaire that did not load well on either factor (items 3, 4, 7, 11, 13, 15, 21, and 37, see Appendix A). These items were reviewed to determine if they had some commonality or were redundant with other items and should be deleted from future versions of the questionnaire. The items were not related to each other in any obvious way. Several of the items served as single-item assessments of health care services, for example, Item 13, "services available for getting prescriptions filled." No other item on the questionnaire asked about pharmacies. Thus, there was no clear rationale for deleting any of the items.

Validity

Mangelsdorff (1994) and Mangelsdorff, et al. (1992) found that retired military clients were generally more satisfied than active duty clients, a finding that mirrors that of Zapka et al. (1995) and Bertakis, Roter, and Putnam (1991), who found that older clients were generally more satisfied than younger clients. A one-way analysis of variance comparing retired clients and their family members ($n$ = 87) to active duty clients and their family members ($n$ = 131) indicated that retired clients and their family members had significantly higher satisfaction scores,[3] $F$ (1, 216) = 10.57, $p$ = 0.0013 (mean satisfaction for retired = 129.37 versus mean for active duty = 118.15).

In contrast, client satisfaction should not be systematically and consistently related to either functional status (Zapka et al., 1995) or information seeking. Regardless of the severity of their functional symptomology, all clients should be ***satisfied*** that their provider has analyzed their health problem thoroughly and treated it appropriately. Similarly, regardless of the level of detail

[3] The score used in this analysis was adjusted because a large number of persons chose "not applicable" on five items. The score used was the sum of all the items on the questionnaire minus the sum of the items 4, 5, 22, 23, and 24.

that they seek, all clients should receive enough information from the provider to ***satisfy*** their need to understand their illness and their role in treating it. Total client satisfaction scores were not related to either functional status ($r$ = -0.28) or to information seeking ($r$ = 0.09), accounting for less than 8% and 1% of the variance, respectively.

Summary

These results provide clear evidence that the new client satisfaction questionnaire had good reliability and validity in a primary care setting. Its internal consistency was quite high and its factor structure and known groups validity were congruent with the purpose for which it was developed.

## Information Seeking

A review of the literature yielded little information on questionnaires designed to quantify the information seeking behavior of the primary care client (Bagley-Burnett, 1988). The information seeking questionnaire developed for this study was based on the Information Preference Questionnaire (IPQ) developed by Hopkins (1986) to assess the degree to which cancer patients sought information about chemotherapy treatment. Her subsequent work on developing a questionnaire to assess information seeking behavior in the general patient population (Hopkins personal communication, 1995) prompted the present attempt to create a more broadly applicable measure of information-seeking behavior suitable for use in the current study. Seven types of changes were made to the 14-item IPQ to yield a 12-item information seeking questionnaire.

(1) The word "doctor" was replaced with the word "provider" to enhance the applicability of the questionnaire in a variety of settings. "Provider" was defined in the questionnaire instructions to insure that clients were familiar with the term. Similarly, the word "chemotherapy" was replaced with the word(s) "health," "health problem," "healthcare treatment," or "treatment plan" to broaden the applicability of the questionnaire and to improve the comprehensiveness of the assessment.

(2) Equivocal phrases were replaced with explicit phrases. For example, "I tend to ask," was replaced with "I ask." Items which asked about two things were simplified to ask about only one. For example, the phrase "about my chemotherapy and how it is going," was replaced with "about my health problem."

(3) Negatively phrased items were rewritten as positively-stated items, in an effort to establish a more obvious continuum of behaviors from "avoidance to hypervigilance" (Hopkins,

1986). For example, "I dislike getting advice about how to manage my chemotherapy treatments," became "I like getting advice about how to manage my health."

(4) Items were arranged in groups of items which were phrased similarly, but contrasted in emphasis.

(5) Seemingly redundant questions were modified to change the emphasis or were deleted.

(6) The rating scale anchors were changed. Hopkins (1986) had used a five point scale "Strongly Disagree through Strongly Agree" with a middle neutral anchor ("Uncertain"). The new questionnaire used the anchors "Never True, Sometimes True, Usually True, True Most of the Time, and Always True" in order to provide a more continuous scale (Hays et al., 1995; Pascoe, 1983) and to maintain uniformity across the questionnaires used in the study.

(7) A "Not Applicable" response option was added to the rating scale, in order to assess the perceived relevance of each item.

Reliability

The new 12-item questionnaire showed good internal consistency with an alpha of 0.82. This figure was slightly lower than that found on the original 14-item questionnaire, 0.88 (Hopkins, 1986), consistent with the shorter length and the more comprehensive nature of the new questionnaire.

Factor Structure

Two factors accounted for 100% of the variance in this questionnaire. The first factor included six items all of which were related to the information seeking behavior of the client (Table 9-11). None of the items had factor loadings on the other factor that exceeded 0.30. This factor alone accounted for 82% of the variance. The second factor included only two items, both of which were concerned with receiving information from non-medical sources (Table 9-12). Neither of these items had factor loadings on the other factor that exceeded 0.15.

**Table 9-11**

**Information Seeking Items Comprising Factor 1:**

**Attitudes towards Seeking Information**

| Item | | Loading |
|---|---|---|
| 3. | I want to know everything I can about my health problem. | 0.78 |
| 1. | I ask my provider a lot of questions about my health problem. | 0.70 |
| 4. | I read everything I can about my health problem. | 0.70 |
| 5. | I believe in asking plenty of questions about health care treatments. | 0.67 |
| 2. | I try to get information about my health problem from as many people as possible. | 0.60 |
| 12. | I need to ask questions because I believe that I will get better faster, if I understand and follow my treatment plan completely. | 0.57 |

**Table 9-12**

**Information Seeking Items Comprising Factor 2:**

**Attitudes towards Receiving Information**

| Item | | Loading |
|---|---|---|
| 11. | I listen carefully when people give me advice or information related to my health. | 0.65 |
| 10. | Family members, friends, and people at work can be good sources of information about dealing with my health. | 0.60 |

In SAS/STAT (v6.11), the "varimax" rotation insures that factors are uncorrelated. However, the overall pattern of this analysis suggested that this questionnaire was measuring two dimensions of a single construct, not two constructs. Items 1 through 5 and 12, which defined the first factor, all assigned an active information seeking role to the client. Items 11 and 10, which defined the second factor, assigned the client slightly different roles, "listening" and "judging." Both dimensions focused on the role of the client. As shown in Table 9-13, items that contained ambiguities about the role of the client, the source of the information, or supplied a negative motivation for seeking information did not account for a meaningful amount of the variance in the total score on the information seeking questionnaire. While this pattern of results suggests that the questionnaire could be improved, it also provides evidence that a single construct is being measured.

**Table 9-13**

**Information Seeking Items with Low Factor Loadings on both Factors**

| Item | | Factor 1 Loading | Factor 2 Loading |
|---|---|---|---|
| 9. | I like getting advice about how to manage my health. | 0.37 | 0.35 |
| 7. | It is better to know ahead of time all of the details about my treatment plan. | 0.35 | 0.30 |
| 8. | I know practically everything there is to know about my treatment and why I am getting it. | 0.44 | 0.16 |
| 6. | I need to ask a lot of questions about my treatment, since my provider may not tell me what I need to know. | 0.24 | 0.20 |

When a number of items fail to load well on any single factor, the question arises as to how the items are different from the other items in the questionnaire. In this case, there were obvious differences. Item 9 (which did not load on either factor) was ambiguous about whether the information was solicited or unsolicited and it was ambiguous about the source of the information. Although Item 9 was somewhat similar to Item 2 (which loaded well on the first factor), Item 2 clearly defined an active role for the client. Item 7 used the phrase "ahead of time" and was ambiguous about the source of the information. This question is relevant for a client with a chronic illness which requires a planned treatment (e.g., cancer and chemotherapy), but might have had little meaning for the typical client in the current study, who was seeking treatment for an ***acute*** illness. Item 8 required the client to assert that he/she ***had*** knowledge, rather than assert that he/she valued knowledge. Item 8 was also the only item which asked about two things, rather than only one, "my treatment and why I am getting it." That ambiguity may have attenuated its discriminative value. Item 6 suggested that the motivation for seeking information was to compensate for provider shortcomings. Although Item 6 was somewhat similar to Item 12, Item 12 suggested that the motivation for seeking information was to improve health outcomes. The latter statement of positive client-centered motivation loaded well on the first factor.

Validity

Information seeking has been shown to co-vary with comorbidity in previous studies of inpatients (Bagley-Burnett, 1988; Hopkins, 1986). Data on symptom severity for comorbid conditions were collected along with information seeking in this study, as well. The sample of clients was divided into three groups on the basis of the individual's rating of the severity of his/her comorbid conditions, No Comorbidity ($n$ = 67), Mild Comorbidity ($n$ = 68), and Moderate Comorbidity ($n$ = 91). A one-way analysis of variance indicated that these groups had significantly different total information seeking scores, $F$ (2, 218) = 2.98, $p$ = 0.05. Pairwise comparisons of the means showed that the No Comorbidity group had significantly lower information seeking

scores (mean = 38.34) than either the Mild or Moderate Comorbidity groups ($p = 0.05$). The information seeking scores of the Mild and Moderate Comorbidity groups (means = 41.28 and 41.63, respectively) were not significantly different from each other ($p = 0.80$). Thus, clients with comorbid conditions were more concerned with obtaining information than those without. Although these differences are not large in this sample of clients who, typically, were seeking treatment for an ***acute*** illness, they were in the appropriate direction.

In contrast, information seeking should not be systematically and consistently related to client satisfaction (Bagley-Burnett, 1988; Hopkins, 1986). Regardless of the level of detail that they seek, all clients should receive enough information from the provider to ***satisfy*** their need to understand their illness and their role in treating it. Total information seeking scores were poorly related to client satisfaction ($r = 0.09$), accounting for less than 1% of the variance.

Summary

A superficial review of the results of the factor analysis might lead to the conclusion that items 6 through 9 should be deleted from the questionnaire. However, these items may serve several important functions in a clinical setting. They may prevent response bias. They may provide internal consistency. Items 7 and 8 may extend the applicability of the questionnaire to clients with chronic conditions. Item 6 may help to identify clients needing additional attention.

Some wordsmithing of the items is probably warranted. The word "people" in Item 11 should be replaced with a more specific identifier. Item 8 should ask about only one thing (e.g., "why I am getting treatment"). Several items use the phrase "health problem." Using the phrase "health condition," "health care," or simply "health" would change the emphasis of the questionnaire and might make it more broadly applicable.

Although further validation of the information seeking questionnaire is clearly required, initial development efforts on the questionnaire and its predecessors have demonstrated the potential utility of such a questionnaire. In an era of health care reform, the importance of effective information exchange between provider and client can not be over emphasized. Reliable and valid instruments which help to quantify the needs and expectations of the client are essential to the success of effective reform.

## Practice Model

The practice model questionnaire was adapted from a 37-item questionnaire developed by Thibodeau and Hawkins (1994). The questionnaire was chosen because of its well-documented reliability and validity and the availability of published literature on its uses. However, three types of changes were made to the questionnaire in order to reduce the response burden of

the providers and to improve the psychometric properties of the questionnaire (when used in this study).

(1) The rating scale was modified. Thibodeau and Hawkins used a six-point rating scale with verbal anchors only at the most extreme points (1 = "least agreement" and 6 = "most agreement"). In the current study, providers were instructed to indicate their acceptance on a five-point rating scale with the anchors "Never True, Sometimes True, Usually True, True Most of the Time, and Always True." This change was made in order to enhance the continuity of the rating scale (Hays et al., 1995; Pascoe, 1983). A "Not Applicable" response option was also added to the rating scale, in order to assess the perceived relevance of each item.

(2) Items that referred to nursing skills or nurse practitioners were reworded slightly to make the questionnaire suitable for administration to physicians, nurse practitioners, and physician assistants. For 16 of the 21 items, this required only a simple substitution of the word "provider." For example, item 26 on the original questionnaire, "It is essential that all nurse practitioners function as client advocates," became item 29 on the new questionnaire, "It is essential that all providers function as client advocates." For the remaining five items, the emphasis of the item was altered to make it more inclusive. For example, item 10 on the original questionnaire, "Nurse practitioners should base their practice on a conceptual model of nursing practice," became item 11 on the new questionnaire, "All providers should base their practice on a conceptual model of practice."

(3) Six new items were written about physician assistants that paralleled existing items about nurse practitioners. For example, item 2 on the original questionnaire, "Nurse practitioners are physician extenders," became items 4 and 5 on the new questionnaire, "Nurse practitioners are physician extenders," and, "Physician assistants are physician extenders." One other nurse-specific item was changed to include physician assistants: item 31 on the original questionnaire, "Nurse practitioners in practice with physicians have more status," became item 35 on the new questionnaire, "Nurse practitioners and physician assistants in practice with physicians have more status." Thus, the new questionnaire contained 43 items.

Reliability

Although the authors of the original questionnaire reported a test-retest reliability of 0.87, no alpha coefficient was reported (Thibodeau & Hawkins, 1988; 1989; & 1994). The new 43-item questionnaire showed good internal consistency with an alpha of 0.85.

Factor Structure

Thibodeau and Hawkins (1994) conceptualized practice model as a set of opposing orientations, one "medical" and the other "nursing." They developed a questionnaire to assess the

practice model of nurses and submitted it to an extensive content analysis. The questionnaire was designed so that the different orientations were clearly defined in a single variable. Low scores indicated a medical orientation and high scores indicated a nursing orientation. When a model suggests that there is a single unidimensional construct being measured, there is little reason to subject the data to factor analysis. It is not surprising then that Thibodeau and Hawkins (1988; 1989; & 1994) did not report a factor analysis of the practice model questionnaire. However, in the current study, the questionnaire was modified to permit a ***comparison*** of the practice models of physicians, nurse practitioners, and physician assistants. Because the changes made to the questionnaire for this study could have modified the representation of the "nursing" and "medical" models, the new questionnaire was subjected to factor analysis.

Four factors accounted for 46% of the variance in the data. A scree plot suggested that little information would be gained by considering more than four factors. The first factor included six items (Table 9-14). None of these items had factor loadings on the other factors that exceeded 0.34. It is clear from the data shown in Table 9-14 that these items assessed the technical component of the provider practice model. The second factor was composed of six items, which dealt with the consultation component of the practice model (Table 9-15). None of the items had factor loadings on the other factors that exceeded 0.33.

**Table 9-14**

**Practice Model Items Comprising Factor 1: Technical Skills**

| Item | | Loading |
|---|---|---|
| 19. | All providers should know how to suture and perform other minor surgical procedures. | 0.72 |
| 17. | All providers should know how to read and interpret X rays. | 0.71 |
| 14. | All providers should know how to perform lab procedures such as lumbar and jugular punctures. | 0.67 |
| 21. | In order for providers to be effective, they must include medical management in their practices. | 0.55 |
| 7. | The client should be expected to comply with a plan of care prescribed by a provider. | 0.51 |
| 2. | A psychosocial history is the most important part of the database. | 0.50 |

**Table 9-15**

**Practice Model Items Comprising Factor 2: Consultation**

| Item | | Loading |
|---|---|---|
| 41. | Physicians should participate in the evaluation of physician assistants. | 0.71 |
| 40. | Physicians should participate in the evaluation of nurse practitioners.* | 0.67 |
| 4. | Nurse practitioners are physician extenders. | 0.66 |
| 5. | Physician assistants are physician extenders. | 0.64 |
| 33. | Protocols should be developed for nurse practitioners by their physician preceptors. | 0.62 |
| 26. | Physicians should participate in the education of physician assistants. | 0.57 |
| 25. | Physicians should participate in the education of nurse practitioners.* | 0.55 |
| 34. | Protocols should be developed for physician assistants by their physician preceptors. | 0.52 |

* These items were included for completeness. However, they had secondary factor loadings greater than 0.35 and so did not meet the criteria for inclusion in the factor.

The third factor was composed of seven items, all of which dealt with professional values (Table 9-16). None of the items had factor loadings on the other factors that exceeded 0.32. The fourth factor was composed of four items, all of which dealt with issues involving scope of practice (Table 9-17). None of the items had factor loadings on the other factors that exceeded 0.34.

**Table 9-16**

**Practice Model Items Comprising Factor 3: Professional Values**

| Item | | Loading |
|---|---|---|
| 12. | Providers can practice independently within the scope of their practice acts. | 0.70 |
| 32. | Health teaching is the primary component of the provider role. | 0.67 |
| 42. | All providers are responsible for contributing to health care knowledge through research. | 0.66 |
| 43. | All providers are responsible for quality assurance and evaluation of their practices. | 0.64 |
| 29. | It is essential that all providers function as client advocates. | 0.55 |
| 8. | The provider role is best enhanced by collaborative practice. | 0.52 |
| 3. | Health is the harmony of mind, body, and spirit. | 0.50 |

**Table 9-17**

**Practice Model Items Comprising Factor 4: Scope of Practice**

| Item | | Loading |
|---|---|---|
| 23. | Nurse practitioners should not practice without medical backup.* | 0.64 |
| 24. | Physician assistants should not practice without medical backup. | 0.62 |
| 37. | The physician should be the team leader with the nurse practitioner designated certain clients to manage.* | 0.60 |
| 11. | All providers should base their practice on a conceptual model of practice. | 0.60 |
| 22. | A practice model directs the provider as to what data to collect. | 0.57 |
| 38. | The physician should be the team leader with the physician assistant designated certain clients to manage. | 0.51 |

* These items were included for completeness. However, they had secondary factor loadings greater than 0.35 and so did not meet the criteria for inclusion in the factor.

These four factors indicate that the primary care provider's practice model is more complex than a single medical-nursing continuum. The changes made to the questionnaire combined with its administration to primary care providers of all types highlighted the broader concerns of the primary care provider -- concerns which encompass not only technical skills and holistic values, but also issues of mentoring, evaluation, autonomy, and quality assurance. Furthermore, items which form the core of a traditional medical model did not contribute to any of the factors; e.g., items 1, 9, 10, 13, 16, 27, and 31 (se Appendix A).

Validity

Thibodeau and Hawkins (1994) found a positive correlation between total scores on the confidence in skills questionnaire and the nursing orientation subscale of the practice model questionnaire. A similar relationship should hold for scores on the confidence in provider skills subscale of the new confidence questionnaire and scores on the new provider practice model questionnaire. Providers with the most confidence should have the strongest identification with a primary care provider model (Thibodeau & Hawkins, 1994). In the current study, providers were divided into three groups on the basis of their level of confidence in their provider skills, Low ($n$ = 17), Medium ($n$ = 19), and High ($n$ = 22). A one-way analysis of variance indicated that these groups had significantly different total scores on the practice model questionnaire, $F$ (2, 55) = 6.28, $p$ = 0.004. Providers in the High confidence group had the highest scores on the practice model questionnaire, while those in the Low confidence group had the lowest scores. Pairwise comparisons of the means showed that the Low and High confidence groups had significantly different total practice model scores (mean = 134.29 and 150.68, respectively, $p$ = 0.002), as did the Medium and High confidence groups (mean for Medium group = 136.89, $p$ = 0.007). However, the Low and Medium groups were not significantly different ($p$ = 0.62).

Thibodeau and Hawkins (1994) suggested that nurse practitioners as a group endorsed a broader, more holistic focus than that associated with a traditional medical model of practice. A similar relationship should hold for all primary care providers, given the holistic and humanistic philosophy which forms the foundation of the primary care model. Providers who value a direct and open information exchange with their clients should have the strongest identification with a primary care provider model. In the current study, providers were divided into three groups on the basis of their level of information giving, Low ($n$ = 22), Medium ($n$ = 21), and High ($n$ = 15). A one-way analysis of variance indicated that these groups had significantly different total scores on the practice model questionnaire, $F$ (2, 55) = 5.27, $p$ = 0.008. Providers in the High information giving group had the highest scores on the practice model questionnaire, while those in the Low group had the lowest scores. Pairwise comparisons of the means showed that the Low and High information giving groups had significantly different total practice model scores (mean = 132.72 and 148.33, respectively, $p$ = 0.005), as did the Low and Medium information giving groups (mean for Medium group = 145.42, $p$ = 0.01). However, the Medium and High groups were not significantly different ($p$ = 0.54).

Summary

These results provide clear evidence that the new practice model questionnaire had good reliability and validity in a primary care setting. Its internal consistency was good and its factor structure and known groups validity were consistent with analogous relationships demonstrated by Thibodeau and Hawkins (1994). However, further development of the questionnaire is warranted. With 43 items, the questionnaire should have an internal consistency higher than 0.85; an effort should be made to eliminate questions which are not contributing to the overall construct. Items defining the traditional medical model should be the first considered. Almost half of the items (20 of 43) had substantial factor loadings on more than one factor. Ways to make items more tightly integrated and more discriminating should be explored in future versions of the questionnaire. In particular, it is striking that items concerned with nurse practitioners loaded on several factors, while identically worded items about physician assistants loaded on only one factor. Further examination of this issue is warranted.

## Confidence

The confidence in skills questionnaire was adapted from a 65-item questionnaire developed by Thibodeau and Hawkins (1994). The questionnaire was chosen because of its well-documented validity and the availability of published literature on its uses. However, two types of

changes were made to the questionnaire in order to reduce the response burden of the providers and to improve the psychometric properties of the questionnaire (when used in this study).

(1) The rating scale was modified. Thibodeau and Hawkins used a six-point rating scale with verbal anchors only at the most extreme points (1 = "least confident" and 6 = "most confident"). In the current study, providers were instructed to indicate how confident they were in their ability to do a specific task ***well,*** on a five-point rating scale with the anchors "Far Below Average, Below Average, Average, Above Average, and Far Above Average." This change was made in order to enhance the continuity of the rating scale (Hays et al., 1995; Pascoe, 1983). A "Not Applicable" response option was also added to the rating scale, in order to assess the perceived relevance of each item.

(2) There were 20 items on the questionnaire that referred to nursing skills or nurse practitioners. They were reworded in order to make the questionnaire suitable for administration to physicians, nurse practitioners, and physician assistants. For example, item 27 on the original questionnaire, "Describe the role and functions of a nurse practitioner," became item 34 on the new questionnaire, "Describe the role and functions of a primary care provider." Similarly, item 39 on the original questionnaire, "Analyze use of over-the- counter medications as part of nursing management," became item 28 on the new questionnaire, "Analyze use of over-the-counter medications as part of client management." One of the 65 items from the original questionnaire was deleted (number 44, "Ability to clearly state my philosophy of nursing").

An analysis of content validity done by Thibodeau and Hawkins (1994) during the development of the original questionnaire suggested that items could be sorted into three categories: medical tasks, nurse practitioner tasks, and indirect/administrative tasks. An analysis of the content validity of the new questionnaire suggested that items could be sorted into three categories: medical tasks, provider tasks, and professional tasks. Items were presented on the questionnaire according to category: medical tasks (items 1-32), provider tasks (items 33-47), and professional tasks (items 48-64).

Reliability

The authors of the original questionnaire did not report a reliability coefficient (Thibodeau & Hawkins, 1988; 1989; & 1994). The new 64-item questionnaire showed excellent internal consistency with an alpha of 0.98.

Factor Structure

Thibodeau and Hawkins (1994) reported that factor analysis of the original questionnaire produced three factors that accounted for 71% of the variance and confirmed their content analysis. Factor analysis of the new questionnaire was problematic because there were 64 items

and only 58 subjects. For this reason only a single a priori hypothesis was evaluated. Factor analysis was used to assess the degree to which the questionnaire items sorted into three factors like those identified in the analysis of content validity. A three factor solution accounted for 59% of the variance. Items were considered to belong to a factor if they had a primary factor loading of 0.50 or greater and secondary loadings on other factors of no greater than 0.40. The latter criterion was more liberal than the usual 0.35 due to the corroborative purpose of the analysis. One factor, "medical tasks," included items 1-26, 28, 30, and 32. Another factor, "provider tasks," included items 35-40, 45, and 46. A final factor, "professional tasks," included items 42-44, 48, 50, 52, 54-62, and 64. These factors were remarkably similar to the categories derived from the analysis of content validity, which suggests that the questionnaire had good construct validity.

Validity

Confidence in technical and interpersonal skills often lead to a desire for independence and a willingness to accept responsibility (Dempster, 1994; Thibodeau & Hawkins, 1994). Thus, highly autonomous providers should have the most confidence in their skills. In the current study, providers were divided into three groups on the basis of their level of autonomy, Low ($n$ = 12), Medium ($n$ = 26), and High ($n$ = 16). A one-way analysis of variance indicated that these groups had significantly different total scores on the confidence questionnaire, $F$ (2, 51) = 6.23, $p$ = 0.004. Providers in the High autonomy group had the highest scores on the confidence questionnaire, while those in the Low autonomy group had the lowest scores. Pairwise comparisons of the means showed that the Low and High autonomy groups had significantly different total confidence scores (mean = 203.92 and 246.63, respectively, $p$ = 0.002), as did the Medium and High autonomy groups (mean for Medium group = 218.46, $p$ = 0.01). However, the Low and Medium groups were not significantly different ($p$ = 0.22).

Thibodeau and Hawkins (1994) suggested that the most confident nurse practitioners strongly endorsed a holistic model of practice. A similar relationship should hold for all primary care providers, given the holistic and humanistic philosophy which forms the foundation of the primary care model. Thibodeau and Hawkins (1994) proposed that providers who most value a direct and open information exchange with their clients should be among the most confident in their technical and interpersonal skills. In the current study, providers were divided into three groups on the basis of their level of information giving, Low ($n$ = 20), Medium ($n$ = 19), and High ($n$ = 15). A one-way analysis of variance indicated that these groups had significantly different total scores on the confidence questionnaire, $F$ (2, 51) = 3.61, $p$ = 0.03. Providers in the High information giving group had the highest scores on the confidence questionnaire, while those in the Low group had the lowest scores. Pairwise comparisons of the means showed that the Low and High information giving groups had significantly different total confidence scores (mean =

214.55 and 244.00, respectively, $p = 0.02$), as did the Medium and High information giving groups (mean for Medium group = 216.95, $p = 0.03$). However, the Low and Medium groups were not significantly different ($p = 0.83$).

Summary

These results provide clear evidence that the confidence in skills questionnaire had good reliability and validity in a primary care setting. Its internal consistency was excellent and its factor structure and known groups validity were consistent with data from previous investigations (Thibodeau & Hawkins, 1994).

## Autonomy

The autonomy questionnaire was adapted from a 30-item questionnaire developed by Dempster (1990 & 1991). The questionnaire was chosen because of its well-documented reliability and validity. Two changes were made to it in order to increase the uniformity of questionnaires used in the study.

(1) The verbal anchors for the five-point rating scale were changed from "Not at all True, Slightly True, Moderately True, Very True, and Extremely True" to "Never, Sometimes, Usually, Most of the Time, and Always." This change was made in an effort to enhance the provider's ability to discriminate response categories and improve the continuity of the rating scale (Hays et al., 1995; Pascoe, 1983).

(2) A "Not Applicable" response option was added to the rating scale, in order to assess the aspects of autonomy that primary care providers considered to be irrelevant to their role. Five items on the modified questionnaire were scored in a reverse manner (items 8, 13, 17, 26, and 28).

Reliability

The new 30-item questionnaire showed good internal consistency with an alpha of 0.86. This figure is less than the 0.95 reported by Dempster (1990 & 1991), a finding consistent with the more heterogeneous nature of the current sample. Although Dempster (1990) sampled nurses from a broad range of settings and included advanced practice nurses in the sample, the nurses in the Dempster study shared a common nursing background. The sample in the current study included physicians, nurse practitioners, and physician assistants from diverse educational and professional backgrounds.

Factor Structure

Three factors accounted for 61% of the variance in the data. A scree plot suggested that little information would be gained by considering more than three factors. The first factor included seven items (Table 9-18). None of these items had factor loadings on the other factors that exceeded 0.30. It is clear from the data shown in Table 9-18 that these items assessed the degree of independence. The second factor was composed of four items, all of which dealt with issues of accountability (Table 9-19). None of the items had factor loadings on the other factors that exceeded 0.30. The third factor was composed of five items, all of which dealt with potential limitations on time or methods of practice (Table 9-20). None of the items had factor loadings on the other factors that exceeded 0.30.

**Table 9-18**

**Autonomy Items Comprising Factor 1: Independence**

| Item | In my practice I ... | Loading |
|---|---|---|
| 7. | am valued for my independent actions. | 0.76 |
| 11. | have been professionally socialized to take independent action. | 0.69 |
| 24. | am provided with a legal basis for independent functioning. | 0.65 |
| 4. | self-determine my role and activities. | 0.65 |
| 2. | have developed the image of myself as an independent professional. | 0.65 |
| 29. | establish the parameters and limits of my practice activities. | 0.61 |
| 6. | take control over my environment and situations I confront. | 0.58 |

**Table 9-19**

**Autonomy Items Comprising Factor 2: Accountability**

| Item | In my practice I ... | Loading |
|---|---|---|
| 14. | have a sense of professionalism | 0.68 |
| 19. | derive feelings of self-respect and esteem from what I do. | 0.62 |
| 9. | provide quality services through my actions. | 0.58 |
| 1. | take responsibility and am accountable for my actions. | 0.54 |

**Table 9-20**

**Autonomy Items Comprising Factor 3: Constraints**

| Item | In my practice I ... | Loading |
|---|---|---|
| 17. | am restrained in what I can do because I am powerless. | 0.75 |
| 8. | am constrained by bureaucratic limitations. | 0.63 |
| 13. | have too many routine tasks to exercise independent action. | 0.62 |
| 26. | have my activities and actions programmed by others. | 0.58 |
| 15. | have the rights and privileges I deserve. | 0.52 |

These data are congruent with that reported by Dempster (1990) who found a four factor solution for the 30 item questionnaire. However, Dempster (1990) could not confirm, to her

satisfaction, the orthogonality of the four factor solution. The three factor solution extracted in the current study seems to be a good fit to the data and supports a straightforward interpretation congruent with the dimensions of autonomy described by Dempster (1994). Unfortunately, this three-factor, orthogonal solution only incorporates two-thirds of the questionnaire's items. The remaining third had substantial factor loadings on two or more factors. Thus, it appears that the changes made to the questionnaire for the current study did little to improve its ability to assess the dimensions of autonomy. Rather, it appears that the autonomy questionnaire should be used as a simple measure of general autonomy.

Validity

As a global measure of autonomy, total scores on the questionnaire should be related to provider satisfaction (Carmel, Yakubovich, Zwanger, & Zaltcman, 1988; Przestrzelski, 1987; Roedel & Nystrom, 1988; Stamps, Piedmont, Slavitt, & Haase, 1978). In the current study, providers were divided into three groups on the basis of their level of overall job satisfaction, Low ($n$ = 12), Medium ($n$ = 22), and High ($n$ = 24). A one-way analysis of variance indicated that these groups reported significantly different levels of autonomy, $F$ (2, 55) = 11.68, $p$ = 0.0001. The group of providers who were least satisfied reported the least autonomy and the group who were most satisfied reported the most autonomy. Pairwise comparisons of the means showed that all three groups were significantly different from each other ($p \leq 0.03$); i.e., the Low satisfaction group (mean autonomy = 108.92) was different from the Medium group (mean = 117.41) which was different from the High group (mean = 126.79), which was also different from the Low group.

Summary

These results provide clear evidence that the autonomy questionnaire had good reliability and validity in a primary care setting. Its internal consistency was quite high and its factor structure and known groups validity were congruent with results of earlier investigations. However, it is equally apparent that the instrument could use some refinement. As a simple measure of general autonomy, the current 30 item questionnaire is rather long. A review of the inter-item correlations should reveal items which are redundant and could be deleted from future versions of the questionnaire.

## Collaboration

The collaboration questionnaire was adapted from a 20-item questionnaire developed by Stichler (1990). The questionnaire was chosen because of its well-documented reliability and validity and the availability of published literature on its uses. Three changes were made to the

questionnaire, in order to reduce the response burden on the subjects and to tailor the questionnaire to the current study.

(1) A five-point rating scale was substituted for the four-point scale and the verbal anchors for the scale were changed from "Rarely, Sometimes, Often, and Nearly Always" to "Never, Sometimes, Usually, Most of the Time, and Always." This change was made in an effort to make the scale more conventional, enhance the provider's ability to discriminate response categories, and improve the continuity of the rating scale (Hays et al., 1995; Pascoe, 1983).

(2) A "Not Applicable" response option was added to the rating scale in order to assess the aspects of collaboration that primary care providers considered to be irrelevant to their role.

(3) The instructions were changed. Providers were asked to rate their collaboration with other providers, to include physicians, nurse practitioners, and physician assistants.

Reliability

The questionnaire showed excellent internal consistency with an alpha of 0.96. This finding is identical to that reported by Stichler (1990 & 1992) who tested the questionnaire on a sample of female nurses working in acute care hospital settings. It is very close to the 0.97 reported by King and Lee (1994) who studied nurses and physicians working in critical care units in Naval hospitals or on Naval hospital ships. Clearly the changes made to the questionnaire for the current study did not reduce the reliability of the instrument.

Factor Structure

A single factor accounted for 75% of the variance in the data. A scree plot suggested that little information would be gained by considering more than one factor. All items had a factor loading of 0.50 or higher on this factor. These data match that reported by Stichler (1990) who found that a single factor accounted for 73% of the variance, as well as that reported by King and Lee (1994) who found that a single factor accounted for 64% of the variance in the questionnaire. The consistency of these data across diverse samples is quite remarkable.

Validity

Stichler (1990), Alpert, Goodman, Kilroy, & Pike (1992), and Koerner, Cohen, and Armstrong (1985) demonstrated that nurse-physician collaboration was a good predictor of job satisfaction among nurses. In the current study, providers were divided into three groups on the basis of their level of overall job satisfaction, Low ($n$ = 12), Medium ($n$ = 22), and High ($n$ = 24). A one-way analysis of variance indicated that these groups reported significantly different levels of collaboration, $F$ (2, 55) = 7.79, $p$ = 0.001. The group of providers who were least satisfied reported the least collaboration and the group who were most satisfied reported the most

collaboration. Pairwise comparisons of the means showed that the Low and High satisfaction groups had significantly different total collaboration scores (mean = 73.08 and 88.08, respectively, $p = 0.0003$), as did the Medium and High satisfaction groups (mean for Medium group = 80.23, $p = 0.02$). However, the Low and Medium groups were not significantly different ($p = 0.08$). These data extend the results of earlier investigations (Alpert, et al., 1992; Koerner, et al., 1985; Stichler, 1990), which demonstrated that collaboration among groups with different status was related to job satisfaction. In the current study, collaboration among peers was related to job satisfaction.

King, Lee, and Henneman (1993) proposed that collaboration would enhance client satisfaction and client health status, as well. Data from Baggs, Ryan, Phelps, Richeson, & Johnson (1992) and Alpert, et al. (1992) support that proposal. In the current study, collaboration with the client, in the form of information giving, was assessed along with collaboration with peers, in order to measure whether collaboration in one context was associated with collaboration in the other. Providers were divided into three groups on the basis of their level of information giving, Low ($n = 22$), Medium ($n = 21$), and High ($n = 15$). A one-way analysis of variance indicated that these groups reported significantly different levels of collaboration, $F (2, 55) = 5.31$, $p = 0.008$. The group of providers who were least likely to exchange information with their clients reported the least collaboration with their peers and the group who were most likely to exchange information with their clients reported the most collaboration with their peers. Pairwise comparisons of the means showed that the Low and High information giving groups had significantly different total collaboration scores (mean = 76.59 and 89.07, respectively, $p = 0.002$). However, the Low and Medium groups were not significantly different (mean for Medium group = 82.62, $p = 0.09$), nor were the Medium and High groups ($p = 0.10$). These data extend the results of earlier investigations and suggest a mechanism by which collaboration among health care providers might improve client satisfaction and client health status.

Summary

These results provide unequivocal evidence that the modified collaboration questionnaire had good reliability and validity in a primary care setting. Its internal consistency was quite high and its factor structure and known groups validity were congruent with results of earlier investigations.

## Information Giving

Although physician-client communication has been studied extensively, a review of the literature yielded no questionnaires suitable for quantifying providers' information giving behavior (Bertakis et al., 1991; Levinson, Stiles, Inui, & Engle, 1993; Roter & Russell, 1994; Sanchez-

Menegay & Stalder, 1994). In order to eliminate the need for elaborate pre-testing of a new questionnaire, a questionnaire was developed by rephrasing items on a questionnaire which measured information seeking in clients (Hopkins, 1986). To meet the needs of the present study, questions about information seeking were reworded to represent the provider's point of view. Phrases such as, "health problem," "health care treatment," and "treatment plan" were used to make the questionnaire broadly applicable. Items were designed to be simple, direct, and positive. A five-point rating scale with the anchors, "Never True, Sometimes True, Usually True, True Most of the Time, and Always True" was used in order to provide a continuous scale (Hays et al., 1995; Pascoe, 1983) and to maintain uniformity across the questionnaires used in the study. A "Not Applicable" response option was included on the rating scale, in order to assess the perceived relevance of each item. The new questionnaire had 16 items.

Reliability

The new 16-item questionnaire showed good internal consistency with an alpha coefficient of 0.88.

Factor Structure

There were three distinct factors isolated in the analysis. They accounted for 89% of the variance in the data. A review of the eigenvalues and the scree plot suggested that little information would be gained by considering more than three factors. Because this was a newly developed questionnaire, liberal criteria were used to select the items composing each factor. Items were considered to belong to a factor if they had a factor loading of 0.40 or higher (instead of 0.50) and secondary loadings on other factors no greater than 0.39 (instead of 0.35). The first factor included six items (Table 9-21). It is clear from the data shown in Table 9-21 that these items quantified the provider's belief in the value of information, specifically that clients should want information, should actively seek information, and should be given all the information available. The second factor was composed of seven items, all of which emphasized the role of the provider in creating an exchange of information with the client (Table 9-22). The third factor was composed of three items, which dealt with the provider's attitudes about whether clients value an exchange of information (Table 9-23).

**Table 9-21**

**Information Giving Items Comprising Factor 1: Information Value**

| Item | | Loading |
|---|---|---|
| 3. | Clients should want to know everything about their health problems. | 0.81 |
| 4. | Clients should read everything they can about their health problems. | 0.80 |
| 7. | It is better to tell clients ahead of time all of the details about their treatment plan. | 0.78 |
| 8. | Clients should know practically everything there is to know about their treatment and why they are getting it. | 0.69 |
| 2. | It is a good idea for clients to get information about their health problems from as many people as possible. | 0.65 |
| 6. | Clients should ask questions about their treatment, since the provider may not know how much the client wants to know. | 0.50 |

**Table 9-22**

**Information Giving Items Comprising Factor 2: Information Exchange**

| Item | | Loading |
|---|---|---|
| 14. | I am comfortable when clients ask a lot of questions. | 0.70 |
| 1. | I encourage clients to ask questions about their health problems. | 0.68 |
| 5. | I encourage clients to ask questions about health care treatments. | 0.68 |
| 16. | I try to adapt my presentation style to fit my client's needs. | 0.64 |
| 15. | Answering client's questions is an important part of my job. | 0.54 |
| 13. | I try to determine how much information a client can use effectively. | 0.41 |
| 12. | I encourage clients to ask questions because I believe that they will get better faster, if they understand and follow a treatment plan completely. | 0.41 |

**Table 9-23**

**Information Giving Items Comprising Factor 3: Information Use**

| Item | | Loading |
|---|---|---|
| 11. | Clients listen carefully when people give them advice or information related to their health. | 0.70 |
| 10. | Family members, friends, and people at work can be good sources of information about dealing with health problems. | 0.51 |
| 9. | Clients like getting advice about how to manage their health. | 0.47 |

During development of the questionnaire, information giving was conceptualized as a single continuum of behaviors ranging from overdisclosure to underdisclosure of information on the part of the provider. However, in SAS/STAT (v6.11), the output of factor analysis with "varimax" rotation is factors which are uncorrelated. Thus, it is unlikely that these three factors represent points on a single continuum. Rather, it appears that communication between provider and client is quite complex and that the questionnaire measures three separate dimensions of the interaction: the value the provider places on information, the degree of responsibility the provider

accepts for fostering an exchange of information, and the provider's perception of the value that the client places on information. These three dimensions of information giving correspond closely to those described in recent discussions of provider-client interactions (Bertakis et al., 1991; Levinson, et al., 1993; Sanchez-Menegay & Stalder, 1994; Simmons & Elias, 1994).

Validity

In the current study, collaboration with the client, in the form of information giving, was assessed along with collaboration with peers, in order to measure whether collaboration in one context was associated with collaboration in the other. Providers were divided into three groups on the basis of their level of collaboration with peers, Low ($n$ = 13), Medium ($n$ = 29), and High ($n$ = 16). A one-way analysis of variance indicated that these groups reported significantly different levels of information giving, $F$ (2, 55) = 9.93, $p$ = 0.0002. The group of providers who were least likely to exchange information with their clients reported the least collaboration with their peers and the group who were most likely to exchange information with their clients reported the most collaboration with their peers. Pairwise comparisons of the means showed that the Low and High collaboration groups had significantly different total information giving scores (mean = 56.92 and 67.19, respectively, $p$ = 0.0004), as did the Medium and High groups (mean for Medium group = 57.93, $p$ = 0.0002). However, the Low and Medium groups were not significantly different ($p$ = 0.68). These data extend the results of earlier investigations of collaboration among nurses and physicians and suggest a mechanism by which collaboration among health care providers might improve client satisfaction and client health status (Alpert, et al., 1992; Baggs, et al., 1992; King et al., 1993).

Summary

These results provide clear evidence that the new information giving questionnaire was appropriate for a primary care setting. Its internal consistency was quite high and its factor structure and known groups validity were consistent with the existing body of literature. Although further validation of the questionnaire is warranted, initial development efforts on the questionnaire demonstrated the potential utility of such a questionnaire. In an era of health care reform the importance of effective information exchange between provider and client can not be overemphasized. Reliable and valid instruments which help to quantify the information needs and expectations of the provider and client are essential to the success of effective reform.

## Job Satisfaction

The job satisfaction questionnaire was adapted from a 22-item questionnaire developed by Kravitz et al. (1993). The questionnaire was chosen because it was designed to measure the professional satisfaction of military physicians and because its reliability and validity had been carefully documented. Three changes were made to it, in order to increase the uniformity of questionnaires used in the study and to tailor the questionnaire to the current study.

(1) The verbal anchors for the five-point rating scale were changed from "Very Dissatisfied, Somewhat Dissatisfied, Neither Satisfied nor Dissatisfied, Somewhat Satisfied, and Very Satisfied" to "Never Satisfied, Sometimes Satisfied, Usually Satisfied, Satisfied Most of the Time, and Always Satisfied." This change was made in an effort to enhance the continuity of the rating scale (Hays et al., 1995; Pascoe, 1983) and to define satisfaction in terms of a time continuum (from never to always).

(2) A "Not Applicable" response option was added to the rating scale, in order to assess the components of satisfaction that primary care providers considered to be irrelevant to their role.

(3) Minor changes were made to the wording of six items in order to make them appropriate for civilian and military physicians, nurse practitioners, and physician assistants. For example, the word "physicians" in item 20 was changed to "providers."

### Reliability

The 22-item questionnaire showed excellent internal consistency with an alpha of 0.93. This finding is congruent with data reported by Kravitz et al. (1993). Alpha coefficients for the subscales of the original questionnaire ranged from 0.65 to 0.89.

### Factor Structure

Items 17 (time on call) and 21 (time out of specialty) were not included in the factor analysis because 38% and 52%, respectively, of the providers indicated the items were not applicable to them. Four factors accounted for 88% of the variance in the remaining data. A scree plot suggested that little information would be gained by considering more than four factors. The first factor included five items (Table 9-24). None of these items had factor loadings on the other factors that exceeded 0.27. It is clear from the data shown in Table 9-24 that these items assessed the financial and personal benefits of the job. The second factor was composed of three items, all of which dealt with the quality of support staff (Table 9-25). None of the items had factor loadings on the other factors that exceeded 0.31. The third factor was composed of two items, which dealt with autonomy (Table 9-26). Neither of the items had factor loadings on the other factors that exceeded 0.35. The fourth factor was composed of two items, which dealt with

time allotted to seeing clients (Table 9-27). Neither of the items had factor loadings on the other factors that exceeded 0.33.

**Table 9-24**

**Job Satisfaction Items Comprising Factor 1: Benefits**

| Item | How satisfied are you with the... | Loading |
|---|---|---|
| 14. | your salary/income? | 0.81 |
| 16. | amount of time you have for your family and personal life? | 0.73 |
| 15. | non-salary benefits? | 0.73 |
| 18. | opportunities to acquire new skills and knowledge? | 0.67 |
| 22. | your ability to arrange referrals to specialists? | 0.59 |

**Table 9-25**

**Job Satisfaction Items Comprising Factor 2: Support**

| Item | How satisfied are you with ... | Loading |
|---|---|---|
| 11. | quality of nursing staff? | 0.83 |
| 13. | quality of clerical staff? | 0.82 |
| 12. | quality of ancillary staff? | 0.66 |

**Table 9-26**

**Job Satisfaction Items Comprising Factor 3: Autonomy**

| Item | How satisfied are you with ... | Loading |
|---|---|---|
| 6. | your ability to practice according to your best judgment? | 0.64 |
| 4. | potential to achieve your professional goals? | 0.62 |

**Table 9-27**

**Job Satisfaction Items Comprising Factor 4: Time with Clients**

| Item | How satisfied are you with ... | Loading |
|---|---|---|
| 8. | amount of time you are able to spend with each patient? | 0.87 |
| 9. | number of outpatients you see on a typical day? | 0.80 |

The results of this factor analysis were very similar to those reported by Kravitz et al. (1993). This is quite remarkable, given the differences in the two samples of subjects and the settings within which they worked. Differences between the results are a function of the more liberal criteria used by Kravitz et al. (1993) in their factor analysis.

Validity

Constraints on autonomy negatively influence job satisfaction (Carmel et al., 1988; Kravitz et al., 1993; Przestrzelski, 1987; Roedel & Nystrom, 1988; Stamps, et al., 1978). In the current study, providers were divided into three groups on the basis of their level of autonomy, Low (n =

14), Medium (n = 26), and High (n = 18). A one-way analysis of variance indicated that these groups reported significantly different levels of job satisfaction (total score on the questionnaire), F (2, 55) = 9.34, p = 0.0003. The group of providers who reported the least autonomy were the least satisfied and the group who reported the most autonomy were the most satisfied. Pairwise comparisons of the means showed that the Low and High autonomy groups had significantly different total satisfaction scores (mean = 64.71 and 82.61, respectively, p = 0.0001), as did the Medium and High autonomy groups (mean for Medium group = 71.69, p = 0.004). However, the Low and Medium groups were not significantly different (p = 0.08).

Stichler (1990), Alpert, et al. (1992), and Koerner, et al. (1985) demonstrated that nurse-physician collaboration was a good predictor of job satisfaction among nurses. In the current study, providers were divided into three groups on the basis of their level of collaboration with their peers, Low (n = 13), Medium (n = 29), and High (n = 16). A one-way analysis of variance indicated that these groups reported significantly different levels of job satisfaction (total score on the questionnaire), F (2, 55) = 5.91, p = 0.005. The group of providers who reported the least collaboration were the least satisfied and the group who reported the most collaboration were the most satisfied. Pairwise comparisons of the means showed that the Low and High collaboration groups had significantly different total satisfaction scores (mean = 64.54 and 80.63, respectively, p = 0.001), as did the Low and Medium collaboration groups (mean for Medium group = 73.38, p = 0.04). However, the Medium and High groups were not significantly different (p = 0.07). These data extend the results of earlier investigations (Alpert, et al., 1992; Koerner, et al., 1985; Stichler, 1990), which demonstrated that collaboration among groups with different status was related to job satisfaction. In the current study, collaboration among peers was related to job satisfaction.

Summary

Although the factor analysis of the modified questionnaire confirmed that of the original questionnaire, 10 out of 22 items on the questionnaire had substantial factor loadings on two or more factors. Future development of the instrument should include attempts to produce a shorter, two-factor version of the questionnaire. Regardless, these results, taken as a whole, provide convincing evidence that the modified satisfaction questionnaire had good reliability and validity in a primary care setting and was suitable for use with all types of providers (physicians, nurse practitioners, and physician assistants).

## Medical Record Review

Guidelines for the review of medical records and a data collection form (see Appendix A) were developed by two registered nurse investigators. The two investigators independently reviewed five medical records from eligible, but not participating subjects who had consented to the release of their records. In this first practice review, the investigators achieved an average of agreement of 88%. The guidelines were adjusted to compensate for differences in search strategies. Then the two investigators independently reviewed four medical records from eligible, but not participating subjects who had consented to the release of their records. In this second practice review, the investigators achieved 100% agreement on three out of four records. One investigator reviewed all medical records using the final set of guidelines.

## Variable Development Procedures

As a result of the reliability and validity analyses, 40 variables were defined and analyzed in Chapters 2 through 8 of this report. Each of the variables is defined below. Copies of the referenced questionnaires are provided in Appendix A.

Analyses of variance and covariance were computed with an alpha level of 0.05. Test statistics and actual $\underline{p}$ values were reported for significant effects. Effects with $\underline{p}$ values greater than 0.05 were simply reported as not significant. Pairwise comparisons of means ($\alpha = 0.05$) were made only in the presence of significant effect tests. Tukey's "least significant difference" tests were used for pairwise comparisons in analyses involving no repeated measures. A priori least squares means comparisons were used in analyses involving repeated measures. Power was calculated for the statistical tests used to analyze the most critical questions. Using the method described in Cohen (1977), the client sample size in this study provided a power of 0.99 to detect differences among means of one standard deviation when comparing four groups (e.g. beneficiary category) using a one way analysis of variance test ($\underline{f} = 0.50$, $\underline{n} = 56$, $\alpha = 0.05$, $\underline{u} = 3$). The provider sample size provided a power of 0.92 to detect differences among means of one standard deviation in a one way analysis of variance comparing three groups; e.g., physicians, nurse practitioners, and physician assistants ($\underline{f} = 0.50$, $\underline{n} = 19$, $\alpha = 0.05$, $\underline{u} = 2$).

Provider Variables

- practice model score - sum of the responses on the 43-item practice model questionnaire.
- confidence score - sum of the responses on the 64-item confidence questionnaire.
- autonomy score - sum of the responses on the 30-item autonomy questionnaire, after the rating scale on items 8, 13, 17, 26, 28 was reversed.
- collaboration score - sum of the responses on the 20-item collaboration questionnaire.
- information giving score - sum of the responses on the 16-item information giving questionnaire.
- job satisfaction score - sum of the responses on the 22-item job satisfaction questionnaire.
- provider type - three groups defined by educational background and credential or the primary care provider (physician, nurse practitioner, and physician assistant).
- age - response to item 1 on the demographics questionnaire (reported in years).
- gender - response to item 2 on the demographics questionnaire.
- ethnicity - response to item 3 on the demographics questionnaire.
- educational level - response to item 4 on the demographics questionnaire.
- experience in a health care occupation - response to item 11 on the demographics questionnaire (reported in years).
- experience as a provider in a military medical facility - response to item 9 on the demographics questionnaire (reported in years).
- experience as a provider in a civilian medical facility - response to item 10 on the demographics questionnaire (reported in years).
- experience as a provider in the current clinic - response to item 13 on the demographics questionnaire (reported in years).
- state - region of the country in which the provider's practice was located.

Client Variables

- functional status score - sum of the responses on the 9-item functional status questionnaire minus the response to item 6.
- health status score - sum of the responses on the 36-item health status questionnaire minus the responses to items 2 and 33-36, after the rating scale was reversed on items 24, 25, 28, 29, 31, 32, 33, and 35.
- satisfaction score - sum of the responses on the 37-item satisfaction questionnaire.
- information seeking score - sum of the responses on the 12-item information seeking questionnaire.
- number of symptoms - count of the symptoms listed in response to item 1 on the health conditions questionnaire administered on the day of the visit to the clinic.
- average rating of severity of symptoms - arithmetic mean of the responses to item 1 on the health conditions questionnaire administered on the day of the visit to the clinic.
- severity category - three groups defined by the client's average rating of the severity of symptoms: low = average symptom rating was 3.5 or greater, medium = average rating was between 2.6 and 3.4, and high = average rating was 2.5 or less.
- symptom category or type of primary reason for visit - nine groups defined by the nature of the client's primary (first) symptom on the day of the visit (item 1 on the health conditions questionnaire administered on the day of the visit to the clinic).
- number of comorbid conditions - count of the conditions listed in response to item 2 on the health conditions questionnaire administered on the day of the visit to the clinic.
- average rating of severity of comorbidity on the day of the visit - arithmetic mean of the responses to item 2 on the health conditions questionnaire administered on the day of the visit to the clinic.
- comorbidity category or type of primary comorbid condition - five groups defined by the nature of the client's primary (first) comorbid condition on the day of the visit (item 2 on the health conditions questionnaire administered on the day of the visit to the clinic).
- clinic use - response to item 2 on the six month follow-up health conditions questionnaire (reported as number of visits).
- age - response to item 1 on the demographics questionnaire (reported in years).
- age category - three groups defined by the response to item 1 on the demographics questionnaire: under 30, 30 to 50, and over 50.
- gender - response to item 2 on the demographics questionnaire.
- ethnicity - response to item 3 on the demographics questionnaire.
- educational level - response to item 4 on the demographics questionnaire.

- income - response to item 8 on the demographics questionnaire.
- beneficiary category - response to item 15 on the demographics questionnaire.
- experience using military medical facilities - response to item 9 on the demographics questionnaire (reported in years).
- experience using current clinic - response to item 11 on the demographics questionnaire (reported in years).
- sample group - two groups defined by whether the client completed and returned the six month follow-up questionnaires.
- clinic type - three groups defined by the nature of the beneficiary categories seen in the clinic.
- state - region of the country in which the client's clinic was located.

Intercorrelations of Key Provider and Client Variables

Pearson correlations were used to identify the degree to which key provider and client variables were related in a simple linear fashion. Table 9-28 provides the intercorrelation matrix of these variables.

**Legend for Table 9-28**

PM = practice model score
Conf = confidence score
Autn = autonomy score
Coll = collaboration score
IG = information giving score
JS = job satisfaction score
Symp = average rating of severity of symptoms on the day of the clinic visit
Co-m = average rating of severity of co-morbidity on the day of the clinic visit
IS 0 = information seeking score on the day of the clinic visit
FS 0 = functional status score on the day of the clinic visit
HS 0 = health status score on the day of the clinic visit
CS 0 = satisfaction score on the day of the clinic visit
FS 1 = functional status score one week after the clinic visit
HS 1 = health status score one week after the clinic visit
IS 6 = information seeking score six months after the clinic visit
FS 6 = functional status score six months after the clinic visit
HS 6 = health status score six months after the clinic visit
CS 6 = satisfaction score six months after the clinic visit

## Table 9-28

## Intercorrelation Matrix of Key Provider and Client Variables

| | | | Provider Variables[a] | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PM | Conf | Autn | Coll | IG | JS |
| Provider Variables[a] | | PM | 1.00 | | | | | |
| | | Conf | 0.40 | 1.00 | | | | |
| | | Autn | 0.33 | 0.48 | 1.00 | | | |
| | | Coll | 0.37 | 0.23 | 0.48 | 1.00 | | |
| | | IG | 0.50 | 0.42 | 0.44 | 0.39 | 1.00 | |
| | | JS | 0.33 | 0.27 | 0.48 | 0.37 | 0.27 | 1.00 |
| Client Variables | Day of Visit[a] | Symp | -0.17 | -0.10 | -0.00 | -0.11 | -0.10 | 0.06 |
| | | Co-m | 0.06 | -0.04 | 0.07 | -0.03 | -0.01 | 0.05 |
| | | IS 0 | -0.03 | -0.02 | -0.09 | -0.06 | 0.02 | -0.05 |
| | | FS 0 | 0.13 | 0.07 | 0.07 | 0.12 | 0.00 | 0.08 |
| | | HS 0 | -0.09 | -0.05 | -0.03 | -0.10 | 0.00 | -0.11 |
| | | CS 0 | -0.14 | -0.07 | -0.14 | -0.13 | -0.08 | -0.03 |
| | One Week[b] | FS 1 | 0.07 | 0.08 | 0.05 | 0.06 | -0.01 | 0.05 |
| | | HS 1 | -0.05 | -0.03 | 0.00 | -0.05 | 0.02 | -0.14 |
| | Six Months[c] | IS 6 | -0.01 | -0.06 | 0.02 | -0.08 | -0.03 | 0.05 |
| | | FS 6 | 0.01 | -0.01 | -0.07 | 0.12 | 0.00 | 0.06 |
| | | HS 6 | 0.01 | -0.03 | 0.08 | -0.07 | 0.04 | -0.04 |
| | | CS 6 | -0.13 | -0.13 | -0.09 | -0.15 | -0.08 | 0.10 |

| | | | Client Variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day of Visit[a] | | | | | | 1 Week[b] | | 6 Months[c] | | | |
| | | | Symp | Co-m | IS 0 | FS 0 | HS 0 | CS 0 | FS 1 | HS 1 | IS 6 | FS 6 | HS 6 | CS 6 |
| Client Variables | Day of Visit[a] | Symp | 1.00 | | | | | | | | | | | |
| | | Co-m | 0.21 | 1.00 | | | | | | | | | | |
| | | IS 0 | -0.01 | -0.12 | 1.00 | | | | | | | | | |
| | | FS 0 | -0.44 | -0.36 | 0.07 | 1.00 | | | | | | | | |
| | | HS 0 | 0.36 | 0.35 | -0.01 | -0.80 | 1.00 | | | | | | | |
| | | CS 0 | 0.08 | 0.02 | 0.09 | -0.19 | 0.07 | 1.00 | | | | | | |
| | One Week[b] | FS 1 | -0.29 | -0.41 | 0.04 | 0.73 | -0.71 | -0.10 | 1.00 | | | | | |
| | | HS 1 | 0.26 | 0.37 | -0.06 | -0.66 | 0.80 | 0.02 | -0.83 | 1.00 | | | | |
| | Six Months[c] | IS 6 | -0.07 | -0.14 | 0.55 | 0.12 | -0.04 | 0.09 | 0.10 | -0.08 | 1.00 | | | |
| | | FS 6 | -0.35 | -0.38 | 0.12 | 0.56 | -0.53 | -0.12 | 0.59 | -0.56 | 0.21 | 1.00 | | |
| | | HS 6 | 0.35 | 0.40 | -0.10 | -0.56 | 0.66 | 0.00 | -0.60 | 0.71 | -0.11 | -0.85 | 1.00 | |
| | | CS 6 | 0.13 | 0.03 | 0.05 | -0.11 | 0.00 | 0.73 | -0.05 | -0.02 | 0.14 | -0.11 | 0.05 | 1.00 |

[a] Sample size = 218.
[b] Sample size = 216.
[c] Sample size ranges from 160 to 167.

## Conclusion

(1) The questionnaires used in this study to measure client outcomes and provider practice styles all demonstrated adequate reliability and validity in a primary care setting. They should serve as effective tools for evaluating healthcare systems that provide primary care services. Systematic evaluation of healthcare methods and outcomes is an essential element of the managed care process. In many cases, self-report questionnaires are the most cost-effective and direct method of obtaining feedback. Using questionnaires with known reliability and validity increases the accuracy, generality, and credibility of evaluation studies.

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## APPENDIX A

## QUESTIONNAIRES

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Demographics (Provider)

**Directions:** Read each item carefully. Then indicate your answer by writing it in the box or space provided or by circling the number preceding the best response.

For example, read **Sample 1** below. If you were "45 years old" you would complete the item as shown in the sample.

Read **Sample 2** below. If you were "male" you would circle the number "(1)" as shown in the sample.

Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

**Sample 1**

1 What is your age? (*write in the box*)

**Sample 2**

2 What is your gender? (*circle one*)

(1) male

(2) female

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## *Primary Care Demonstration Project*

| | | | |
|---|---|---|---|
| 1 | What is your age? (*write in the box*) | | (7-8) |
| 2 | What is your gender? (*circle one*)<br>(1) male<br>(2) female | | (9) |
| 3 | What is your ethnic identification? (*circle one or write in the space*)<br>(1) African-American<br>(2) Asian-American<br>(3) Caucasian-American<br>(4) Hispanic-American<br>(5) American-Indian<br>(6) other (*write in*) _____ | | (10-11) |
| 4 | What is the **highest** educational level that you have completed? (*circle only one*)<br>(1) less than high school<br>(2) high school diploma/GED<br>(3) some college, no degree<br>(4) some college, license or certificate<br>(5) some college, associate's degree (AA, AS, etc.)<br>(6) college, bachelor's degree (BA, BS, BSN, etc.)<br>(7) graduate college, advanced degree (MBA, MSN, MPH, etc.)<br>(8) graduate college, professional degree (PHD, MD, DO, etc.) | | (12) |
| 5 | What is your marital status? (*circle one*)<br>(1) married<br>(2) single, never married<br>(3) single, previously married<br>(4) widowed | | (13) |
| 6 | How many people live in your home? (*write in the box*) | | (14-15) |

*shaded area for office use only*

| | | | |
|---|---|---|---|
| 7 | How many people rely on you for financial support? (*write in the box; if none, write 0.*) | | (16-17) |

8 What is the **total** income of all people who live in your home? (*circle one*) (18)

(1) $20,000 or less
(2) $21,000 to $40,000
(3) $41,000 to $60,000
(4) $61,000 to $80,000
(5) $81,000 to $100,000
(6) $101,000 or more

| | | | |
|---|---|---|---|
| 9 | How many **years** have you worked as a provider in military medical treatment facilities? (*round to the nearest year*) | | (19-20) |
| 10 | How many **years** have you worked as a provider in civilian medical treatment facilities? (*round to the nearest year*) | | (21-22) |
| 11 | How many **years** have you worked in a health care occupation? (*round to the nearest year*) | | (23-24) |
| 12 | How many **years** have you worked in a primary care clinic? (*round to the nearest year*) | | (25-26) |
| 13 | How many **years** have you worked in this clinic? (*round to the nearest year*) | | (27-28) |

14 How many jobs do you currently hold? (*circle one*) (29)

(1) one part time job
(2) one full time job
(3) two part time jobs
(4) 1 full time and 1 part time job
(5) more than 2 jobs

15 In your experience as a provider, how often have you worked with physicians? (*circle one*) (30)

(1) never
(2) sometimes
(3) usually
(4) most of the time
(5) always

*shaded area for office use only*

16 In your experience as a provider, how often have you worked with nurse practitioners? (*circle one*) (31)

(1) never
(2) sometimes
(3) usually
(4) most of the time
(5) always

17 In your experience as a provider, how often have you worked with physician assistants? (*circle one*) (32)

(1) never
(2) sometimes
(3) usually
(4) most of the time
(5) always

18 How many years ago did you graduate from medical, nursing, or physician assistant school? (*write in box*) (33-34)

19 How did you become a physician? (*circle one or write in the space*) (35)

(O) not applicable
(1) non U.S. medical school
(2) U.S. medical school
(3) U.S. school of osteopathy
(4) other (*write in*) _____

20 How did you become a nurse practitioner? (*circle one or write in the space*) (36)

(O) not applicable
(1) diploma or certificate
(2) academic degree (MSN)
(3) other (*write in*) _____

21 How did you become a physician assistant? (*circle one or write in the space)* (37)

(O) not applicable
(1) diploma or certificate
(2) academic degree (*write in degree*) _____
(3) other (*write in*) _____

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22 List all occupational credentials you have earned; for example, board certified internist, certified nurse practitioner, etc. (*do not abbreviate*) (38-43)

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23 Do you use encounter forms in your practice? (*forms which classify the client according to diagnosis or procedure*) (44)

(1) never
(2) with a few clients
(3) with some clients
(4) with most clients
(5) with all clients

---

24 Do you use written treatment protocols or algorithms in your practice? (45)

(1) never
(2) once or twice a quarter
(3) once or twice a month
(4) at least once a week
(5) everyday

## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how accurately the item describes your professional philosophy. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you believe that the "physical exam is most important" "most of the time," you should circle the number "4" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | | Never True | Some-times True | Usually True | True Most of the Time | Always True | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | The physical exam is the most important part of the data base. | 1 | 2 | 3 | 4 | 5 | 0 | (46) |
| 2 | A psychosocial history is the most important part of the data base. | 1 | 2 | 3 | 4 | 5 | 0 | (47) |
| 3 | Health is harmony of the mind, body, and spirit. | 1 | 2 | 3 | 4 | 5 | 0 | (48) |
| 4 | Nurse practitioners are physician extenders. | 1 | 2 | 3 | 4 | 5 | 0 | (49) |
| 5 | Physician assistants are physician extenders. | 1 | 2 | 3 | 4 | 5 | 0 | (50) |
| 6 | All providers should receive third party payments as independent practitioners. | 1 | 2 | 3 | 4 | 5 | 0 | (51) |
| 7 | The client should be expected to comply with a plan of care prescribed by a provider. | 1 | 2 | 3 | 4 | 5 | 0 | (52) |
| 8 | The provider role is best enhanced by collaborative practice. | 1 | 2 | 3 | 4 | 5 | 0 | (53) |
| 9 | The goal of health care is to cure illness. | 1 | 2 | 3 | 4 | 5 | 0 | (54) |
| 10 | Care of physical problems should receive priority over psychosocial problems. | 1 | 2 | 3 | 4 | 5 | 0 | (55) |
| 11 | All providers should base their practice on a conceptual model of practice. | 1 | 2 | 3 | 4 | 5 | 0 | (56) |
| 12 | Providers can practice independently within the scope of their practice acts. | 1 | 2 | 3 | 4 | 5 | 0 | (57) |
| 13 | Physical exam skills are more important than interviewing skills. | 1 | 2 | 3 | 4 | 5 | 0 | (58) |
| 14 | All providers should know how to perform lab procedures such as lumbar and jugular punctures. | 1 | 2 | 3 | 4 | 5 | 0 | (59) |
| 15 | All education for nurse practitioners should take place within schools of nursing. | 1 | 2 | 3 | 4 | 5 | 0 | (60) |
| 16 | Health is the absence of abnormalities of structure and function. | 1 | 2 | 3 | 4 | 5 | 0 | (61) |
| 17 | All providers should know how to read and interpret Xrays. | 1 | 2 | 3 | 4 | 5 | 0 | (62) |
| 18 | Nurse practitioners learn the provider role best from nurse preceptors. | 1 | 2 | 3 | 4 | 5 | 0 | (63) |

Instrument adapted from Thibodeau and Hawkins (1988)

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| | | Never True | Some-times True | Usually True | True Most of the Time | Always True | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 19 | All providers should know how to suture and perform other minor surgical procedures. | 1 | 2 | 3 | 4 | 5 | 0 | (64) |
| 20 | Management strategies should flow from a provider's practice model. | 1 | 2 | 3 | 4 | 5 | 0 | (65) |
| 21 | In order for providers to be effective, they must include medical management in their practices. | 1 | 2 | 3 | 4 | 5 | 0 | (66) |
| 22 | A practice model directs the provider as to what data to collect. | 1 | 2 | 3 | 4 | 5 | 0 | (67) |
| 23 | Nurse practitioners should not practice without medical back up. | 1 | 2 | 3 | 4 | 5 | 0 | (68) |
| 24 | Physician assistants should not practice without medical back-up. | 1 | 2 | 3 | 4 | 5 | 0 | (69) |
| 25 | Physicians should participate in the education of nurse practitioners. | 1 | 2 | 3 | 4 | 5 | 0 | (70) |
| 26 | Physicians should participate in the education of physician assistants. | 1 | 2 | 3 | 4 | 5 | 0 | (71) |
| 27 | The medical model is most congruent with the provider role. | 1 | 2 | 3 | 4 | 5 | 0 | (72) |
| 28 | Providers need to develop their own protocols for practice. | 1 | 2 | 3 | 4 | 5 | 0 | (73) |
| 29 | It is essential that all providers function as client advocates. | 1 | 2 | 3 | 4 | 5 | 0 | (74) |
| 30 | Health maintenance is the prime component of the provider role. | 1 | 2 | 3 | 4 | 5 | 0 | (75) |
| 31 | All providers must be skilled in differential diagnosis of all common illnesses. | 1 | 2 | 3 | 4 | 5 | 0 | (76) |
| 32 | Health teaching is the primary component of the provider role. | 1 | 2 | 3 | 4 | 5 | 0 | (77) |
| 33 | Protocols should be developed for nurse practitioners by their physician preceptors. | 1 | 2 | 3 | 4 | 5 | 0 | (78) |
| 34 | Protocols should be developed for physician assistants by their physician preceptors. | 1 | 2 | 3 | 4 | 5 | 0 | (79) |
| 35 | Nurse practitioners and physician assistants in practice with physicians have more status. | 1 | 2 | 3 | 4 | 5 | 0 | (80) |
| 36 | Providers must utilize knowledge of research in the delivery of care. | 1 | 2 | 3 | 4 | 5 | 0 | (81) |
| 37 | The physician should be the team leader with the nurse practitioner designated certain clients to manage. | 1 | 2 | 3 | 4 | 5 | 0 | (82) |
| 38 | The physician should be the team leader with the physician assistant designated certain clients to manage. | 1 | 2 | 3 | 4 | 5 | 0 | (83) |
| 39 | Leadership within the profession is central to the role of the provider. | 1 | 2 | 3 | 4 | 5 | 0 | (84) |
| 40 | Physicians should participate in the evaluation of nurse practitioners. | 1 | 2 | 3 | 4 | 5 | 0 | (85) |

Instrument adapted from Thibodeau and Hawkins (1988)

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| | | Never True | Some-times True | Usually True | True Most of the Time | Always True | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 41 | Physicians should participate in the evaluation of physician assistants. | 1 | 2 | 3 | 4 | 5 | 0 | (86) |
| 42 | All providers are responsible for contributing to health care knowledge through research. | 1 | 2 | 3 | 4 | 5 | 0 | (87) |
| 43 | All providers are responsible for quality assurance and evaluation of their practices. | 1 | 2 | 3 | 4 | 5 | 0 | (88) |

## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how confident you are about your ability to do this task well. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you believe that you are "above average" in your ability to distinguish "between subjective and objective data," you should circle the number "4" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | | Far Below Average | Below Average | Average | Above Average | Far Above Average | *Not Applicable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | Know the difference between subjective and objective data. | 1 | 2 | 3 | 4 | 5 | 0 | (89) |
| 2 | Know the component parts of a health history. | 1 | 2 | 3 | 4 | 5 | 0 | (90) |
| 3 | Obtain a complete health history. | 1 | 2 | 3 | 4 | 5 | 0 | (91) |
| 4 | Know age appropriate modifications for a health history. | 1 | 2 | 3 | 4 | 5 | 0 | (92) |
| 5 | Evaluate history for completeness, organization, and clarity. | 1 | 2 | 3 | 4 | 5 | 0 | (93) |
| 6 | Use communication skills appropriate to age of client. | 1 | 2 | 3 | 4 | 5 | 0 | (94) |
| 7 | Use communication skills appropriate to type of data collection. | 1 | 2 | 3 | 4 | 5 | 0 | (95) |
| 8 | Recognize and respond to verbal cues presented by the client. | 1 | 2 | 3 | 4 | 5 | 0 | (96) |
| 9 | Recognize and respond to non-verbal cues presented by the client. | 1 | 2 | 3 | 4 | 5 | 0 | (97) |
| 10 | Differentiate between normal and abnormal heart sounds. | 1 | 2 | 3 | 4 | 5 | 0 | (98) |
| 11 | Perform a respiratory system examination. | 1 | 2 | 3 | 4 | 5 | 0 | (99) |
| 12 | Perform an abdominal examination. | 1 | 2 | 3 | 4 | 5 | 0 | (100) |
| 13 | Perform a musculoskeletal examination. | 1 | 2 | 3 | 4 | 5 | 0 | (101) |
| 14 | Perform a neurological examination. | 1 | 2 | 3 | 4 | 5 | 0 | (102) |
| 15 | Perform a pelvic examination. | 1 | 2 | 3 | 4 | 5 | 0 | (103) |
| 16 | Perform an examination of the head and neck. | 1 | 2 | 3 | 4 | 5 | 0 | (104) |
| 17 | Perform an examination of the skin. | 1 | 2 | 3 | 4 | 5 | 0 | (105) |
| 18 | Perform a breast examination. | 1 | 2 | 3 | 4 | 5 | 0 | (106) |

Instrument adapted from Thibodeau and Hawkins (1988)

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| | | Far Below Average | Below Average | Average | Above Average | Far Above Average | *Not Applicable* | |
|---|---|---|---|---|---|---|---|---|
| 19 | Perform a lymphatic system examination. | 1 | 2 | 3 | 4 | 5 | 0 | (107) |
| 20 | Perform a complete physical exam. | 1 | 2 | 3 | 4 | 5 | 0 | (108) |
| 21 | Know the observation component of the physical exam. | 1 | 2 | 3 | 4 | 5 | 0 | (109) |
| 22 | Know the palpation component of the physical exam. | 1 | 2 | 3 | 4 | 5 | 0 | (110) |
| 23 | Know the percussion component of the physical exam. | 1 | 2 | 3 | 4 | 5 | 0 | (111) |
| 24 | Know the auscultation component of the physical exam. | 1 | 2 | 3 | 4 | 5 | 0 | (112) |
| 25 | Present physical findings in descriptive terms using the problem-oriented medical record | 1 | 2 | 3 | 4 | 5 | 0 | (113) |
| 26 | Relate knowledge of anatomy and physiology to the physical exam. | 1 | 2 | 3 | 4 | 5 | 0 | (114) |
| 27 | Perform a Denver Developmental Screening Test. | 1 | 2 | 3 | 4 | 5 | 0 | (115) |
| 28 | Analyze use of over-the-counter medications as part of client management. | 1 | 2 | 3 | 4 | 5 | 0 | (116) |
| 29 | Utilize a comprehensive data base in the delivery of primary care. | 1 | 2 | 3 | 4 | 5 | 0 | (117) |
| 30 | Initiate or perform laboratory tests. | 1 | 2 | 3 | 4 | 5 | 0 | (118) |
| 31 | Apply knowledge of therapeutic nutrition across the age span in the management of clients. | 1 | 2 | 3 | 4 | 5 | 0 | (119) |
| 32 | Incorporate knowledge of pharmacologic agents in management of clients. | 1 | 2 | 3 | 4 | 5 | 0 | (120) |
| 33 | Apply knowledge of life span physical and psychosocial factors to the delivery of primary | 1 | 2 | 3 | 4 | 5 | 0 | (121) |
| 34 | Describe the role and functions of a primary care provider. | 1 | 2 | 3 | 4 | 5 | 0 | (122) |
| 35 | Develop a definition of health congruent with a conceptual model of primary care practice. | 1 | 2 | 3 | 4 | 5 | 0 | (123) |
| 36 | Analyze nursing and medical models in the delivery of primary care. | 1 | 2 | 3 | 4 | 5 | 0 | (124) |
| 37 | Develop protocols for client management for selected risk factors. | 1 | 2 | 3 | 4 | 5 | 0 | (125) |
| 38 | Evaluate protocols for selected risk factors. | 1 | 2 | 3 | 4 | 5 | 0 | (126) |
| 39 | Plan client management strategies for selected risk factors across the age span. | 1 | 2 | 3 | 4 | 5 | 0 | (127) |
| 40 | Apply a conceptual primary care model to client management of risk factors. | 1 | 2 | 3 | 4 | 5 | 0 | (128) |

Instrument adapted from Thibodeau and Hawkins (1988)

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| | | Far Below Average | Below Average | Average | Above Average | Far Above Average | *Not Applicable* | |
|---|---|---|---|---|---|---|---|---|
| 41 | Evaluate lay literature on health care. | 1 | 2 | 3 | 4 | 5 | 0 | (129) |
| 42 | Apply teaching-learning theory to a variety of teaching situations. | 1 | 2 | 3 | 4 | 5 | 0 | (130) |
| 43 | Evaluate the effectiveness of my teaching. | 1 | 2 | 3 | 4 | 5 | 0 | (131) |
| 44 | Incorporate communication theory and group process into the provider role. | 1 | 2 | 3 | 4 | 5 | 0 | (132) |
| 45 | Utilize primary care provider model in role implementation. | 1 | 2 | 3 | 4 | 5 | 0 | (133) |
| 46 | Educate clients and other providers about the role of the primary care provider. | 1 | 2 | 3 | 4 | 5 | 0 | (134) |
| 47 | Clearly state my philosophy of primary care practice. | 1 | 2 | 3 | 4 | 5 | 0 | (135) |
| 48 | Assume leadership responsibility in collaboration with other providers to establish | 1 | 2 | 3 | 4 | 5 | 0 | (136) |
| 49 | Apply knowledge of change theory in acting as a client advocate. | 1 | 2 | 3 | 4 | 5 | 0 | (137) |
| 50 | Prepare my resume. | 1 | 2 | 3 | 4 | 5 | 0 | (138) |
| 51 | Negotiate for position and salary. | 1 | 2 | 3 | 4 | 5 | 0 | (139) |
| 52 | Analyze current licensure and credentialing laws. | 1 | 2 | 3 | 4 | 5 | 0 | (140) |
| 53 | Know provider practice act in state where I practice. | 1 | 2 | 3 | 4 | 5 | 0 | (141) |
| 54 | Describe various means of reimbursement for provider services. | 1 | 2 | 3 | 4 | 5 | 0 | (142) |
| 55 | Utilize several methodologies in implementing change. | 1 | 2 | 3 | 4 | 5 | 0 | (143) |
| 56 | Utilize concepts of power and authority. | 1 | 2 | 3 | 4 | 5 | 0 | (144) |
| 57 | Analyze obstacles and supports to the role of the primary care provider. | 1 | 2 | 3 | 4 | 5 | 0 | (145) |
| 58 | Plan strategies to change or diminish obstacles to role implementation. | 1 | 2 | 3 | 4 | 5 | 0 | (146) |
| 59 | Plan research as part of role implementation. | 1 | 2 | 3 | 4 | 5 | 0 | (147) |
| 60 | Plan a demonstration project for health care delivery to a selected group of clients. | 1 | 2 | 3 | 4 | 5 | 0 | (148) |
| 61 | Evaluate total role of the primary care provider. | 1 | 2 | 3 | 4 | 5 | 0 | (149) |
| 62 | Describe methods of audit and quality assurance. | 1 | 2 | 3 | 4 | 5 | 0 | (150) |

Instrument adapted from Thibodeau and Hawkins (1988)

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| | | Far Below Average | Below Average | Average | Above Average | Far Above Average | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 63 | Describe assertiveness techniques and evaluate use for the primary care provider role. | 1 | 2 | 3 | 4 | 5 | 0 | (151) |
| 64 | Analyze financial aspects of the role of primary care provider as employee and/or independent | 1 | 2 | 3 | 4 | 5 | 0 | (152) |

Instrument adapted from Thibodeau and Hawkins (1988)

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## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how accurately the item describes you and your professional behavior. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you believe that you "take responsibility for your actions" " most of the time," you should circle the number "4" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | **In my practice I...** | **Never** | **Some-times** | **Usually** | **Most of the Time** | **Always** | ***Not Appli-cable*** | |
|---|---|---|---|---|---|---|---|---|
| 1 | take responsibility and am accountable for my actions. | 1 | 2 | 3 | 4 | 5 | 0 | (153) |
| 2 | have developed the image of myself as an independent professional. | 1 | 2 | 3 | 4 | 5 | 0 | (154) |
| 3 | base my actions on the full scope of my knowledge and ability. | 1 | 2 | 3 | 4 | 5 | 0 | (155) |
| 4 | self-determine my role and activities. | 1 | 2 | 3 | 4 | 5 | 0 | (156) |
| 5 | derive satisfaction from what I do. | 1 | 2 | 3 | 4 | 5 | 0 | (157) |
| 6 | take control over my environment and situations I confront. | 1 | 2 | 3 | 4 | 5 | 0 | (158) |
| 7 | am valued for my independent actions. | 1 | 2 | 3 | 4 | 5 | 0 | (159) |
| 8 | am constrained by bureaucratic limitations. | 1 | 2 | 3 | 4 | 5 | 0 | (160) |
| 9 | provide quality services through my actions. | 1 | 2 | 3 | 4 | 5 | 0 | (161) |
| 10 | am confident in my ability to perform my role independently. | 1 | 2 | 3 | 4 | 5 | 0 | (162) |
| 11 | have been professionally socialized to take independent action. | 1 | 2 | 3 | 4 | 5 | 0 | (163) |
| 12 | function with the authority to do what I know should be done. | 1 | 2 | 3 | 4 | 5 | 0 | (164) |
| 13 | have too many routine tasks to exercise independent action. | 1 | 2 | 3 | 4 | 5 | 0 | (165) |
| 14 | have a sense of professionalism. | 1 | 2 | 3 | 4 | 5 | 0 | (166) |
| 15 | have the right and privileges I deserve. | 1 | 2 | 3 | 4 | 5 | 0 | (167) |
| 16 | have the professional experience needed for independent actions. | 1 | 2 | 3 | 4 | 5 | 0 | (168) |
| 17 | am restrained in what I can do because I am powerless. | 1 | 2 | 3 | 4 | 5 | 0 | (169) |
| 18 | collaborate with others outside my field when I feel there is a need. | 1 | 2 | 3 | 4 | 5 | 0 | (170) |
| 19 | derive feelings of self-respect and esteem from what I do. | 1 | 2 | 3 | 4 | 5 | 0 | (171) |

Instrument adapted from Dempster (1991)

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| | In my practice I... | Never | Some-times | Usually | Most of the Time | Always | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 20 | make my own decisions related to what I do. | 1 | 2 | 3 | 4 | 5 | 0 | (172) |
| 21 | possess ownership of my practice; that is, my role belongs to me. | 1 | 2 | 3 | 4 | 5 | 0 | (173) |
| 22 | have the power to influence decisions and actions of others. | 1 | 2 | 3 | 4 | 5 | 0 | (174) |
| 23 | have a sense of self-achievement. | 1 | 2 | 3 | 4 | 5 | 0 | (175) |
| 24 | am provided with a legal basis for independent functioning. | 1 | 2 | 3 | 4 | 5 | 0 | (176) |
| 25 | demonstrate mastery of skills essential for freedom of action. | 1 | 2 | 3 | 4 | 5 | 0 | (177) |
| 26 | have my activities and actions programmed by others. | 1 | 2 | 3 | 4 | 5 | 0 | (178) |
| 27 | have the respect of those in other disciplines. | 1 | 2 | 3 | 4 | 5 | 0 | (179) |
| 28 | cannot optimally function because I do not have legal status. | 1 | 2 | 3 | 4 | 5 | 0 | (180) |
| 29 | establish the parameters and limits of my practice activities. | 1 | 2 | 3 | 4 | 5 | 0 | (181) |
| 30 | accept the consequences for the choices I make. | 1 | 2 | 3 | 4 | 5 | 0 | (182) |
| | | | | | | | | |

Instrument adapted from Dempster (1991)

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## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how accurately the item describes you and your professional behavior with other providers (physicians, nurse practitioners, and physician assistants). Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you believe that you "feel free to share ideas with one another" " most of the time," you should circle the number "4" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | | Never | Some-times | Usually | Most of the Time | Always | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | We feel free to share ideas with one another. | 1 | 2 | 3 | 4 | 5 | 0 | (183) |
| 2 | We acknowledge one another's competence. | 1 | 2 | 3 | 4 | 5 | 0 | (184) |
| 3 | We support each other as team members. | 1 | 2 | 3 | 4 | 5 | 0 | (185) |
| 4 | We work as partners. | 1 | 2 | 3 | 4 | 5 | 0 | (186) |
| 5 | We are committed to working together as a team. | 1 | 2 | 3 | 4 | 5 | 0 | (187) |
| 6 | We trust one another. | 1 | 2 | 3 | 4 | 5 | 0 | (188) |
| 7 | There is a sharing of expertise and talents between us. | 1 | 2 | 3 | 4 | 5 | 0 | (189) |
| 8 | We work as "equals" or "partners" for the accomplishment of some goals. | 1 | 2 | 3 | 4 | 5 | 0 | (190) |
| 9 | We work together as a team. | 1 | 2 | 3 | 4 | 5 | 0 | (191) |
| 10 | My opinions are listened to. | 1 | 2 | 3 | 4 | 5 | 0 | (192) |
| 11 | I feel that my input is truly valued. | 1 | 2 | 3 | 4 | 5 | 0 | (193) |
| 12 | We work together as associates. | 1 | 2 | 3 | 4 | 5 | 0 | (194) |
| 13 | There is a feeling of mutual regard and respect. | 1 | 2 | 3 | 4 | 5 | 0 | (195) |
| 14 | We make an effort to resolve any conflicts which arise to our mutual satisfaction. | 1 | 2 | 3 | 4 | 5 | 0 | (196) |
| 15 | We both actively participate in the relationship in order to meet our patient care goals. | 1 | 2 | 3 | 4 | 5 | 0 | (197) |
| 16 | We share information openly with one another. | 1 | 2 | 3 | 4 | 5 | 0 | (198) |
| 17 | We problem solve together. | 1 | 2 | 3 | 4 | 5 | 0 | (199) |
| 18 | We recognize the need to have a sense of "give and take" in the relationship. | 1 | 2 | 3 | 4 | 5 | 0 | (200) |
| 19 | We recognize our interdependence with one another in order to meet our goals. | 1 | 2 | 3 | 4 | 5 | 0 | (201) |
| 20 | We are committed to the process of working to meet our goals. | 1 | 2 | 3 | 4 | 5 | 0 | (202) |

Instrument adapted from Stichler (1992)

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## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how accurately the item describes your professional philosophy and practice. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you "always" "encourage your clients to ask questions," you should circle the number "5" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | | Never True | Some-times True | Usually True | True Most of the Time | Always True | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | I encourage clients to ask questions about their health problems. | 1 | 2 | 3 | 4 | 5 | 0 | (203) |
| 2 | It is a good idea for clients to get information about their health problems from as many people as possible. | 1 | 2 | 3 | 4 | 5 | 0 | (204) |
| 3 | Clients should want to know everything about their health problems. | 1 | 2 | 3 | 4 | 5 | 0 | (205) |
| 4 | Clients should read everything they can about their health problems. | 1 | 2 | 3 | 4 | 5 | 0 | (206) |
| 5 | I encourage clients to ask questions about health care treatments. | 1 | 2 | 3 | 4 | 5 | 0 | (207) |
| 6 | Clients should ask questions about their treatment, since the provider may not know how much the client wants to know. | 1 | 2 | 3 | 4 | 5 | 0 | (208) |
| 7 | It is better to tell clients ahead of time all of the details about their treatment plan. | 1 | 2 | 3 | 4 | 5 | 0 | (209) |
| 8 | Clients should know practically everything there is to know about their treatment and why they are getting it. | 1 | 2 | 3 | 4 | 5 | 0 | (210) |
| 9 | Clients like getting advice about how to manage their health. | 1 | 2 | 3 | 4 | 5 | 0 | (211) |
| 10 | Family members, friends, and people at work can be good sources of information about dealing with health problems. | 1 | 2 | 3 | 4 | 5 | 0 | (212) |
| 11 | Clients listen carefully when people give them advice or information related to their health. | 1 | 2 | 3 | 4 | 5 | 0 | (213) |

Instrument adapted from Hopkins (1986)

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| | | Never True | Some-times True | Usually True | True Most of the Time | Always True | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 12 | I encourage clients to ask questions because I believe that they will get better faster, if they understand and follow a treatment plan completely. | 1 | 2 | 3 | 4 | 5 | 0 | (214) |
| 13 | I try to determine how much information a client can use effectively. | 1 | 2 | 3 | 4 | 5 | 0 | (215) |
| 14 | I am comfortable when clients ask a lot of questions. | 1 | 2 | 3 | 4 | 5 | 0 | (216) |
| 15 | Answering clients' questions is an important part of my job. | 1 | 2 | 3 | 4 | 5 | 0 | (217) |
| 16 | I try to adapt my presentation style to fit my client's needs. | 1 | 2 | 3 | 4 | 5 | 0 | (218) |

Instrument adapted from Hopkins (1986)

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Job Satisfaction

## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how satisfied you are with that aspect of your professional situation. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you are "always satisfied" with "your overall professional practice," you should circle the number "5" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | How satisfied are you with... | Never Satisfied | Some-times Satisfied | Usually Satisfied | Satisfied Most of the Time | Always Satisfied | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | your overall professional practice? | 1 | 2 | 3 | 4 | 5 | 0 | (219) |
| 2 | your current work setting? | 1 | 2 | 3 | 4 | 5 | 0 | (220) |
| 3 | extent to which your current practice has met your expectations? | 1 | 2 | 3 | 4 | 5 | 0 | (221) |
| 4 | potential to achieve your professional goals? | 1 | 2 | 3 | 4 | 5 | 0 | (222) |
| 5 | quality of care you are able to provide? | 1 | 2 | 3 | 4 | 5 | 0 | (223) |
| 6 | your ability to practice according to your best judgment? | 1 | 2 | 3 | 4 | 5 | 0 | (224) |
| 7 | efficiency with which you are able to practice in your facility? | 1 | 2 | 3 | 4 | 5 | 0 | (225) |
| 8 | amount of time you are able to spend with each patient? | 1 | 2 | 3 | 4 | 5 | 0 | (226) |
| 9 | number of outpatients you see on a typical day? | 1 | 2 | 3 | 4 | 5 | 0 | (227) |
| 10 | continuity of patient care you are able to provide? | 1 | 2 | 3 | 4 | 5 | 0 | (228) |
| 11 | quality of nursing staff? | 1 | 2 | 3 | 4 | 5 | 0 | (229) |
| 12 | quality of ancillary staff? | 1 | 2 | 3 | 4 | 5 | 0 | (230) |
| 13 | quality of clerical staff? | 1 | 2 | 3 | 4 | 5 | 0 | (231) |
| 14 | your salary/income? | 1 | 2 | 3 | 4 | 5 | 0 | (232) |
| 15 | non-salary benefits? | 1 | 2 | 3 | 4 | 5 | 0 | (233) |
| 16 | amount of time you have for your family and personal life? | 1 | 2 | 3 | 4 | 5 | 0 | (234) |
| 17 | amount of time you are required to be on call? | 1 | 2 | 3 | 4 | 5 | 0 | (235) |
| 18 | opportunities to acquire new skills and knowledge? | 1 | 2 | 3 | 4 | 5 | 0 | (236) |

Instrument adapted from Kravitz et al. (1993)

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| | How satisfied are you with... | Never Satisfied | Some-times Satisfied | Usually Satisfied | Satisfied Most of the Time | Always Satisfied | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 19 | your ability to help form policies at your facility? | 1 | 2 | 3 | 4 | 5 | 0 | (237) |
| 20 | professional abilities of providers in your facility? | 1 | 2 | 3 | 4 | 5 | 0 | (238) |
| 21 | amount of time you spend practicing outside your specialty? | 1 | 2 | 3 | 4 | 5 | 0 | (239) |
| 22 | your ability to arrange referrals to specialists? | 1 | 2 | 3 | 4 | 5 | 0 | (240) |

Instrument adapted from Kravitz et al. (1993)

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Demographics (Client)

**Directions**: Read each item carefully. Then indicate your answer by writing it in the box or space provided or by circling the number preceding the best response.

For example, read **Sample 1** below. If you were "45 years old" you would complete the item as shown in the sample.

Read **Sample 2** below. If you were "male" you would circle the number "(1)" as shown in the sample.

Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

**Sample 1**

1 What is your age? (*write in the box*)

**Sample 2**

2 What is your gender? (*circle one*)

(1) male

(2) female

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## *Primary Care Demonstration Project*

| | | | |
|---|---|---|---|
| 1 | What is your age? (*write in the box*) | | (14-15) |
| 2 | What is your gender? (*circle one*) | (1) male<br>(2) female | (16) |
| 3 | What is your ethnic identification? (*circle one or write in the space*) | (1) African-American<br>(2) Asian-American<br>(3) Caucasian-American<br>(4) Hispanic-American<br>(5) American-Indian<br>(6) other (*write in*) _____ | (17-18) |
| 4 | What is the **highest** educational level that you have completed? (*circle only one*) | (1) less than high school<br>(2) high school diploma/GED<br>(3) some college, no degree<br>(4) some college, license or certificate<br>(5) some college, associate's degree (AA, AS, etc.)<br>(6) college, bachelor's degree (BA, BS, BSN, etc.)<br>(7) graduate college, advanced degree (MBA, MSN, MPH, etc.)<br>(8) graduate college, professional degree (PHD, MD, DO, etc.) | (19) |
| 5 | What is your marital status? (*circle one*) | (1) married<br>(2) single, never married<br>(3) single, previously married<br>(4) widowed | (20) |
| 6 | How many people live in your home? (*write in the box*) | | (21-22) |

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| | | | |
|---|---|---|---|
| 7 | How many people rely on you for financial support? (*write in the box; if none, write 0.*) | | (23-24) |

8 What is the **total** income of all people who live in your home? (*circle one*) (25)

(1) $20,000 or less
(2) $21,000 to $40,000
(3) $41,000 to $60,000
(4) $61,000 to $80,000
(5) $81,000 to $100,000
(6) $101,000 or more

| | | | |
|---|---|---|---|
| 9 | How many **years** have you used military medical treatment facilities for your health care? (*round to the nearest year*) | | (26-27) |
| 10 | How many **years** have you used civilian medical treatment facilities for your health care? (*round to the nearest year*) | | (28-29) |
| 11 | How many **years** have you used this clinic for your health care? (*round to the nearest year*) | | (30-31) |

12 How often in the last year have you had a physician as your primary care provider? (*circle one*) (32)

(O) not sure
(1) never
(2) sometimes
(3) usually
(4) most of the time
(5) always

13 How often in the last year have you had a nurse practitioner as your primary care provider? (*circle one*) (33)

(O) not sure
(1) never
(2) sometimes
(3) usually
(4) most of the time
(5) always

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14 How often in the last year have you had a physician assistant as your primary care provider? (*circle one*) (34)

(O) not sure
(1) never
(2) sometimes
(3) usually
(4) most of the time
(5) always

---

15 What is your curent beneficiary category? (35)

(1) active duty service member
(2) family member of active duty service member
(3) retired service member
(4) family member of retired service member
(5) other (*write in*) _____

Symptoms (Day of Visit)

**Directions**: Read each item carefully. Then indicate your answer by writing it in the box provided and circling the number. See the **Sample** below for an example of how to complete the form. Please write neatly.

Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

**Sample**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Why did you come to the clinic today? | Very Severe | Severe | Moderate | Mild | Very Mild |
| | | 1 | 2 | 3 | 4 | 5 |

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## *Primary Care Demonstration Project*

1 Why did you come to the clinic today? (*List your symptoms in the box and then indicate how severe each symptom is by circling the number to the right.*)

| | Very Severe | Severe | Moderate | Mild | Very Mild | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | (36-38) |
| | 1 | 2 | 3 | 4 | 5 | (39-41) |
| | 1 | 2 | 3 | 4 | 5 | (42-44) |
| | 1 | 2 | 3 | 4 | 5 | (45-47) |
| | 1 | 2 | 3 | 4 | 5 | (48-50) |

2 What other health problems do you have? (*List your medical conditions such as high blood pressure, back pain, etc. in the box and then indicate how severe each symptom is by circling the number to the right.*)

| | Very Severe | Severe | Moderate | Mild | Very Mild | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | (51-53) |
| | 1 | 2 | 3 | 4 | 5 | (54-56) |
| | 1 | 2 | 3 | 4 | 5 | (57-59) |
| | 1 | 2 | 3 | 4 | 5 | (60-62) |
| | 1 | 2 | 3 | 4 | 5 | (63-65) |

3 How many times have you visited this clinic in the last six months? (*write number in box*) (66-67)

4 How many times have you visited other medical clinics in the last six months? (*write number in box*) (68-69)

5 How many times have you been hospitalized in the last six months? (*write number in box*) (70-71)

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Symptoms (One Week and Six Months)

Directions: Read each item carefully. Then indicate your answer by writing it in the box provided and circling the number. See the **Sample** below for an example of how to complete the form. Please write neatly.

Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

**Sample**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Do you have any health problems? | Very Severe | Severe | Moderate | Mild | Very Mild |
| | | 1 | 2 | 3 | 4 | 5 |

*shaded area for office use only*

## *Primary Care Demonstration Project*

1 Do you have any health problems? (*List your current medical conditions, such as high blood pressure, back pain, etc. in the box and then indicate how severe each symptom is by circling the number to the right.*)

| | Very Severe | Severe | Moderate | Mild | Very Mild | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | (8-10) |
| | 1 | 2 | 3 | 4 | 5 | (11-13) |
| | 1 | 2 | 3 | 4 | 5 | (14-16) |
| | 1 | 2 | 3 | 4 | 5 | (17-19) |
| | 1 | 2 | 3 | 4 | 5 | (20-22) |

2 How many times have you visited this clinic in the last six months? (*write number in box*) (23-24)

3 How many times have you visited other medical clinics in the last six months? (*write number in box*) (25-26)

4 How many times have you been hospitalized in the last six months? (*write number in box*) (27-28)

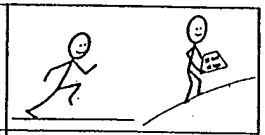
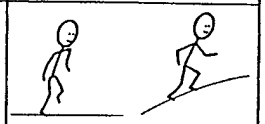
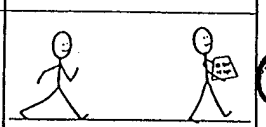
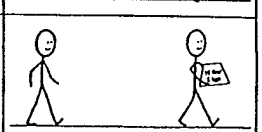
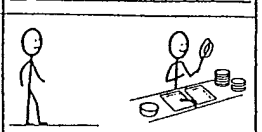
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Directions: Read each item carefully. Next decide how accurately the item describes your health. Then indicate your answer by circling the number next to the level that has the best answer, as shown here in the sample item. Please answer all of the items. All of the information in this questionnaire is important. Your answers will be kept confidential.

**Sample Problem**

## PHYSICAL FITNESS

During the past 24 to 48 hours ...
What was the hardest physical activity you could do for at least 2 minutes ?

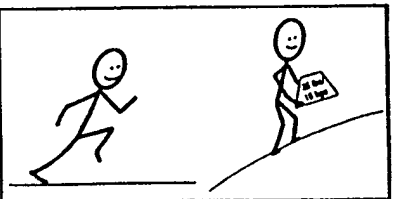
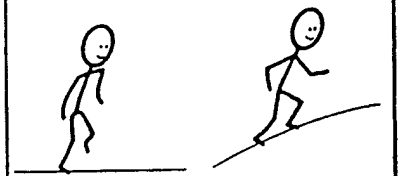
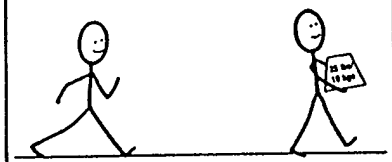
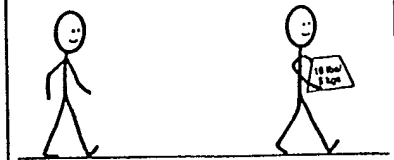
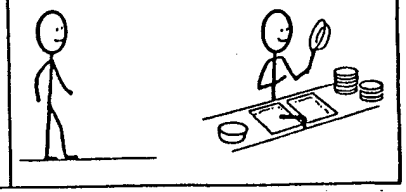
| | | |
|---|---|---|
| Very heavy, (for example)<br>•Run, fast pace<br>•Carry a heavy load upstairs or uphill (25 lbs/10 kgs) |  | 1 |
| Heavy, (for example)<br>•Jog, slow pace<br>•Climb stairs or a hill moderate pace |  | 2 |
| Moderate, (for example)<br>•Walk, medium pace<br>•Carry a heavy load level ground (25 lbs/10 kgs) |  | 3 |
| Light, (for example)<br>•Walk, medium pace<br>•Carry light load on level ground (10 lbs/5kgs) |  | 4 |
| Very light, (for example)<br>•Walk, slow pace<br>•Wash dishes |  | 5 |

Instrument adapted from Beaufait et al. (1992)

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# PHYSICAL FITNESS

During the past 24 to 48 hours ...
What was the hardest physical activity you could do for at least 2 minutes ?

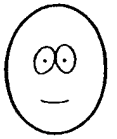
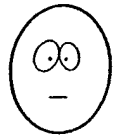
| | | |
|---|---|---|
| Very heavy, (for example)<br>•Run, fast pace<br>•Carry a heavy load upstairs or uphill<br>(25 lbs/10 kgs) |  | 1 |
| Heavy, (for example)<br>•Jog, slow pace<br>•Climb stairs or a hill moderate pace |  | 2 |
| Moderate, (for example)<br>•Walk, medium pace<br>•Carry a heavy load level ground<br>(25 lbs/10 kgs) |  | 3 |
| Light, (for example)<br>•Walk, medium pace<br>•Carry light load on level ground<br>(10 lbs/5kgs) |  | 4 |
| Very light, (for example)<br>•Walk, slow pace<br>•Wash dishes |  | 5 |

Instrument adapted from Beaufait et al. (1992)



# FEELINGS

During the past 24 to 48 hours ...
How much have you been bothered by emotional problems such as feeling anxious, depressed, irritable or downhearted and blue ?

| | | |
|---|---|---|
| Not at all |  | 1 |
| Slightly |  | 2 |
| Moderately |  | 3 |
| Quite a bit |  | 4 |
| Extremely |  | 5 |

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# DAILY ACTIVITIES

During the past 24 to 48 hours ...

How much difficulty have you had doing your usual activities or task, both inside and outside the house because of your physical and emotional health ?

| | | |
|---|---|---|
| No difficulty at all |  | 1 |
| A little bit of difficulty |  | 2 |
| Some difficulty |  | 3 |
| Much difficulty |  | 4 |
| Could not do |  | 5 |

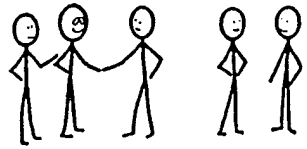
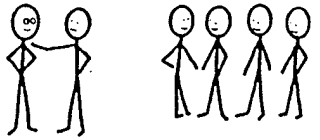
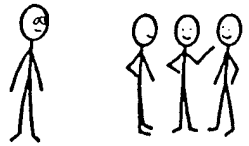
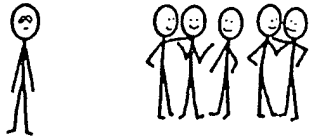
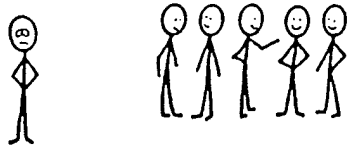
Instrument adapted from Beaufait et al. (1992)



# SOCIAL ACTIVITIES

During the past 24 to 48 hours ...

Has your physical and emotional health limited your social activities with family, friends, neighbors or groups ?

| | | |
|---|---|---|
| Not at all |  | 1 |
| Slightly |  | 2 |
| Moderately |  | 3 |
| Quite a bit |  | 4 |
| Extremely |  | 5 |

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# PAIN

During the past 24 to 48 hours ...
How much bodily pain have you generally had ?

| | | |
|---|---|---|
| No pain |  | 1 |
| Very mild pain |  | 2 |
| Mild pain |  | 3 |
| Moderate pain |  | 4 |
| Severe pain |  | 5 |

Instrument adapted from Beaufait et al. (1992)



# CHANGE IN HEALTH

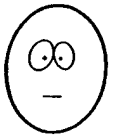
How would you rate your overall health now compared to 72 hours ago?

| | | |
|---|---|---|
| Much better | ▲▲ ++ | 1 |
| A little better | ▲ + | 2 |
| About the same | ◆▶ = | 3 |
| A little worse | ▼ − | 4 |
| Much worse | ▼▼ −− | 5 |

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# OVERALL HEALTH

During the past 24 to 48 hours ...
How would you rate your health in general ?

| | | |
|---|---|---|
| Excellent |  | 1 |
| Very good |  | 2 |
| Good |  | 3 |
| Fair |  | 4 |
| Poor |  | 5 |

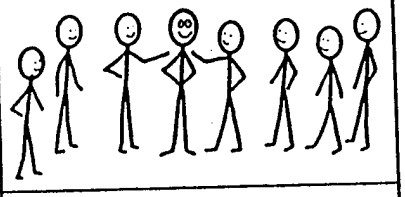
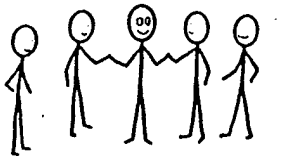
Instrument adapted from Beaufait et al. (1992)



# SOCIAL SUPPORT

During the past 24 to 48 hours ...
Was someone available to help you if you needed and wanted help? For example if you

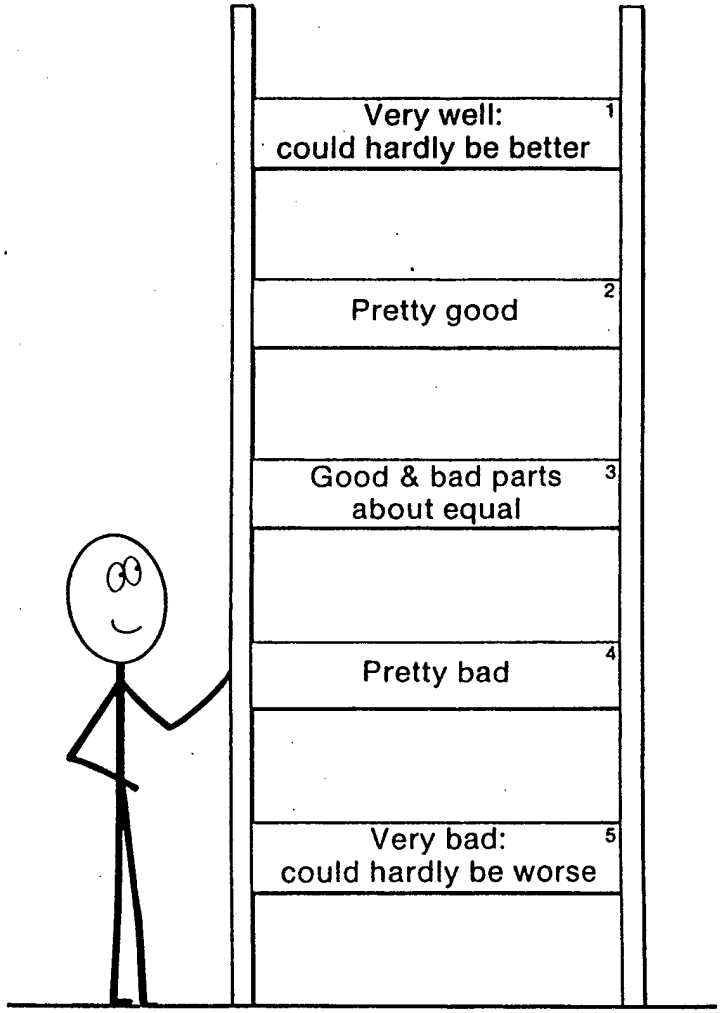
- — felt very nervous, lonely, or blue
- — got sick and had to stay in bed
- — needed someone to talk to
- — needed help with daily chores
- — needed help just taking care of yourself

| | | |
|---|---|---|
| Yes, as much as I wanted |  | 1 |
| Yes, quite a bit |  | 2 |
| Yes, some |  | 3 |
| Yes, a little |  | 4 |
| No, not at all |  | 5 |

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# QUALITY OF LIFE

How have things been going for you during the past 24 to 48 hours?




1

2

3

4

5

(37)

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Instrument adapted from Beaufait et al. (1992)

**Directions**: Read each item carefully. Next decide how accurately the item describes your health. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you believe that your health is "very good," you should circle the number "4" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

| | | Poor | Fair | Adequate | Very Good | Excellent | |
|---|---|---|---|---|---|---|---|
| 1 | In general, my health is: | 1 | 2 | 3 | 4 | 5 | (81) |
| | | **Much Worse** | **Somewhat Worse** | **the Same** | **Somewhat Better** | **Much Better** | |
| 2 | Compared to six months ago, my health now is generally: | 1 | 2 | 3 | 4 | 5 | (82) |
| | **How much are you currently limited in...** | **Extremely Limited** | **Limited Quite a Bit** | **Moderately Limited** | **Slightly Limited** | **Not Limited** | |
| 3 | vigorous activities, such as running, lifting heavy objects, participating in strenuous sports? | 1 | 2 | 3 | 4 | 5 | (83) |
| 4 | moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf? | 1 | 2 | 3 | 4 | 5 | (84) |
| 5 | lifting or carrying groceries? | 1 | 2 | 3 | 4 | 5 | (85) |
| 6 | climbing several flights of stairs? | 1 | 2 | 3 | 4 | 5 | (86) |
| 7 | climbing one flight of stairs? | 1 | 2 | 3 | 4 | 5 | (87) |
| 8 | bending, kneeling, or stooping? | 1 | 2 | 3 | 4 | 5 | (88) |
| 9 | walking more than a mile? | 1 | 2 | 3 | 4 | 5 | (89) |
| 10 | walking several blocks? | 1 | 2 | 3 | 4 | 5 | (90) |
| 11 | walking one block? | 1 | 2 | 3 | 4 | 5 | (91) |
| 12 | bathing or dressing yourself? | 1 | 2 | 3 | 4 | 5 | (92) |

Instrument adapted from Hays, Sherbourne, and Mazel (1993)

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| | **In the last 24 to 48 hours has your...** | **Extremely Limited** | **Limited Quite a Bit** | **Moderately Limited** | **Slightly Limited** | **Not Limited** | |
|---|---|---|---|---|---|---|---|
| 13 | physical health reduced the amount of time you could spend on work or other activities? | 1 | 2 | 3 | 4 | 5 | (93) |
| 14 | physical health prevented you from accomplishing everything you wanted to do? | 1 | 2 | 3 | 4 | 5 | (94) |
| 15 | physical health changed the kind of work you could do? | 1 | 2 | 3 | 4 | 5 | (95) |
| 16 | physical health made it difficult to perform work or other activities (for example, the activity took extra effort)? | 1 | 2 | 3 | 4 | 5 | (96) |
| | **In the last 24 to 48 hours have your...** | **Extremely Limited** | **Limited Quite a Bit** | **Moderately Limited** | **Slightly Limited** | **Not Limited** | |
| 17 | emotional problems reduced the amount of time you could spend on work or other activities? | 1 | 2 | 3 | 4 | 5 | (97) |
| 18 | emotional problems prevented you from accomplishing everything you wanted to do? | 1 | 2 | 3 | 4 | 5 | (98) |
| 19 | emotional problems made it difficult to perform work or other activities (for example, the activity took extra effort)? | 1 | 2 | 3 | 4 | 5 | (99) |
| 20 | physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? | 1 | 2 | 3 | 4 | 5 | (100) |
| | | **Very Severe** | **Severe** | **Moderate** | **Mild** | **None** | |
| 21 | In the last 24 to 48 hours, how much physical pain have you had? | 1 | 2 | 3 | 4 | 5 | (101) |
| | | **Extremely Limited** | **Limited Quite a Bit** | **Moderately Limited** | **Slightly Limited** | **Not Limited** | |
| 22 | In the last 24 to 48 hours, how much did physical pain interfere with your normal work or other activities? | 1 | 2 | 3 | 4 | 5 | (102) |
| | **In the last 24 to 48 hours have you...** | **Never** | **Sometimes** | **Usually** | **Most of the Time** | **Always** | |
| 23 | felt full of pep? | 1 | 2 | 3 | 4 | 5 | (103) |
| 24 | been a very nervous person? | 1 | 2 | 3 | 4 | 5 | (104) |
| 25 | felt so down in the dumps that nothing could cheer you up? | 1 | 2 | 3 | 4 | 5 | (105) |
| 26 | felt calm and peaceful? | 1 | 2 | 3 | 4 | 5 | (106) |
| 27 | had a lot of energy? | 1 | 2 | 3 | 4 | 5 | (107) |
| 28 | felt downhearted and blue? | 1 | 2 | 3 | 4 | 5 | (108) |
| 29 | felt worn out? | 1 | 2 | 3 | 4 | 5 | (109) |
| 30 | been a happy person? | 1 | 2 | 3 | 4 | 5 | (110) |
| 31 | felt tired? | 1 | 2 | 3 | 4 | 5 | (111) |

Instrument adapted from Hays, Sherbourne, and Mazel (1993)

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| | | Never | Sometimes | Usually | Most of the Time | Always | |
|---|---|---|---|---|---|---|---|
| 32 | In the last 24 to 48 hours, how much of the time has your physical health or your emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)? | 1 | 2 | 3 | 4 | 5 | (112) |
| | **In general, ...** | **Never True** | **Sometimes True** | **Usually True** | **True Most of the Time** | **Always True** | |
| 33 | I seem to get sick more easily than other people. | 1 | 2 | 3 | 4 | 5 | (113) |
| 34 | I am as healthy as anyone I know. | 1 | 2 | 3 | 4 | 5 | (114) |
| 35 | I expect my health to get worse. | 1 | 2 | 3 | 4 | 5 | (115) |
| 36 | my health is excellent. | 1 | 2 | 3 | 4 | 5 | (116) |

Instrument adapted from Hays, Sherbourne, and Mazel (1993)

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## *Primary Care Demonstration Project*

**Directions:** Read each item carefully. Next decide how accurately the item describes you. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you "always" "ask your provider a lot of questions," you should circle the number "5" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.
Note: The word "provider" refers to the person who provides your diagnosis and recommends a treatment (e.g., physician, nurse practitioner, or physician assistant).

| | | Never True | Some-times True | Usually True | True Most of the Time | Always True | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | I ask my provider a lot of questions about my health problem. | 1 | 2 | 3 | 4 | 5 | 0 | (117) |
| 2 | I try to get information about my health problem from as many people as possible. | 1 | 2 | 3 | 4 | 5 | 0 | (118) |
| 3 | I want to know everything I can about my health problem. | 1 | 2 | 3 | 4 | 5 | 0 | (119) |
| 4 | I read everything I can about my health problem. | 1 | 2 | 3 | 4 | 5 | 0 | (120) |
| 5 | I believe in asking plenty of questions about health care treatments. | 1 | 2 | 3 | 4 | 5 | 0 | (121) |
| 6 | I need to ask a lot of questions about my treatment, since my provider may not tell me what I need to know. | 1 | 2 | 3 | 4 | 5 | 0 | (122) |
| 7 | It is better to know ahead of time all of the details about my treatment plan. | 1 | 2 | 3 | 4 | 5 | 0 | (123) |
| 8 | I know practically everything there is to know about my treatment and why I am getting it. | 1 | 2 | 3 | 4 | 5 | 0 | (124) |
| 9 | I like getting advice about how to manage my health. | 1 | 2 | 3 | 4 | 5 | 0 | (125) |
| 10 | Family members, friends, and people at work can be good sources of information about dealing with my health. | 1 | 2 | 3 | 4 | 5 | 0 | (126) |
| 11 | I listen carefully when people give me advice or information related to my health. | 1 | 2 | 3 | 4 | 5 | 0 | (127) |
| 12 | I need to ask questions because I believe that I will get better faster, if I understand and follow my treatment plan completely. | 1 | 2 | 3 | 4 | 5 | 0 | (128) |

Instrument adapted from Hopkins (1986)

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## *Primary Care Demonstration Project*

**Directions**: Read each item carefully. Next decide how satisfied you are with that aspect of your health care. Then indicate your answer by circling the number in the column under the heading that has the best answer. For example, read Item 1. If you are "always satisfied" with "the health care you receive in this clinic," you should circle the number "5" on Item 1. Please answer all of the items. All of the information on this questionnaire is important. Your answers will be kept confidential.

Note: The word "provider" refers to the person who provides your diagnosis and recommends a treatment (e.g., physician, nurse practitioner, or physician assistant).

| | How satisfied are you with the... | Never Satisfied | Some-times Satisfied | Usually Satisfied | Satisfied Most of the Time | Always Satisfied | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 1 | health care you receive in this clinic? | 1 | 2 | 3 | 4 | 5 | 0 | (129) |
| 2 | health care services provided at this clinic? | 1 | 2 | 3 | 4 | 5 | 0 | (130) |
| 3 | convenience of the location of the clinic? | 1 | 2 | 3 | 4 | 5 | 0 | (131) |
| 4 | hours when the clinic is open? | 1 | 2 | 3 | 4 | 5 | 0 | (132) |
| 5 | access to specialty care if you need it? | 1 | 2 | 3 | 4 | 5 | 0 | (133) |
| 6 | access to hospital care if you need it? | 1 | 2 | 3 | 4 | 5 | 0 | (134) |
| 7 | access to medical care in an emergency? | 1 | 2 | 3 | 4 | 5 | 0 | (135) |
| 8 | arrangements for making appointments for medical care by phone? | 1 | 2 | 3 | 4 | 5 | 0 | (136) |
| 9 | length of time spent waiting at the clinic to see the provider? | 1 | 2 | 3 | 4 | 5 | 0 | (137) |
| 10 | length of time you wait to get an appointment for routine care? | 1 | 2 | 3 | 4 | 5 | 0 | (138) |
| 11 | availability of medical information or advice by phone? | 1 | 2 | 3 | 4 | 5 | 0 | (139) |
| 12 | access to medical care whenever you need it? | 1 | 2 | 3 | 4 | 5 | 0 | (140) |
| 13 | services available for getting prescriptions filled? | 1 | 2 | 3 | 4 | 5 | 0 | (141) |
| 14 | protection you have against hardship due to medical expenses? | 1 | 2 | 3 | 4 | 5 | 0 | (142) |
| 15 | arrangements for you to get the medical care you need without financial problems? | 1 | 2 | 3 | 4 | 5 | 0 | (143) |
| 16 | thoroughness of examinations and accuracy of diagnoses? | 1 | 2 | 3 | 4 | 5 | 0 | (144) |
| 17 | skill, experience and training of providers? | 1 | 2 | 3 | 4 | 5 | 0 | (145) |

Instrument adapted from Mangelsdorff et al. (1992)

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| | How satisfied are you with the... | Never Satisfied | Some-times Satisfied | Usually Satisfied | Satisfied Most of the Time | Always Satisfied | *Not Appli-cable* | |
|---|---|---|---|---|---|---|---|---|
| 18 | thoroughness of treatment? | 1 | 2 | 3 | 4 | 5 | 0 | (146) |
| 19 | explanations of medical procedures and tests? | 1 | 2 | 3 | 4 | 5 | 0 | (147) |
| 20 | attention given to what you have to say? | 1 | 2 | 3 | 4 | 5 | 0 | (148) |
| 21 | advice you get about ways to avoid illness and stay healthy? | 1 | 2 | 3 | 4 | 5 | 0 | (149) |
| 22 | number of providers you have to choose from? | 1 | 2 | 3 | 4 | 5 | 0 | (150) |
| 23 | arrangements for choosing a personal provider? | 1 | 2 | 3 | 4 | 5 | 0 | (151) |
| 24 | ease of seeing the provider of your choice? | 1 | 2 | 3 | 4 | 5 | 0 | (152) |
| 25 | friendliness and courtesy shown to you by your provider? | 1 | 2 | 3 | 4 | 5 | 0 | (153) |
| 26 | personal interest in you and your medical problems? | 1 | 2 | 3 | 4 | 5 | 0 | (154) |
| 27 | respect shown to you and attention to your privacy? | 1 | 2 | 3 | 4 | 5 | 0 | (155) |
| 28 | reassurance and support offered to you by your provider? | 1 | 2 | 3 | 4 | 5 | 0 | (156) |
| 29 | friendliness and courtesy shown to you by administrative staff ( e.g., receptionist)? | 1 | 2 | 3 | 4 | 5 | 0 | (157) |
| 30 | amount of time you have with your provider during a visit? | 1 | 2 | 3 | 4 | 5 | 0 | (158) |
| 31 | outcomes of your medical care (how much you are helped)? | 1 | 2 | 3 | 4 | 5 | 0 | (159) |
| 32 | overall quality of care and services? | 1 | 2 | 3 | 4 | 5 | 0 | (160) |
| 33 | way the provider listens to your concerns? | 1 | 2 | 3 | 4 | 5 | 0 | (161) |
| 34 | provider's explanation of your condition (uses language you can understand)? | 1 | 2 | 3 | 4 | 5 | 0 | (162) |
| 35 | provider's explanation about your medications? | 1 | 2 | 3 | 4 | 5 | 0 | (163) |
| 36 | provider's answers to your questions? | 1 | 2 | 3 | 4 | 5 | 0 | (164) |
| 37 | provider's suggestions for self-care (practical to your life style)? | 1 | 2 | 3 | 4 | 5 | 0 | (165) |

Instrument adapted from Mangelsdorff et al. (1992)

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## *Primary Care Demonstration Project*
## *Medical Record Review Form*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Subject Number:** _____ | | | | | | (1-6) |
| | | | Initial Date: _____ | | 6 mon Date: _____ | | (7-14) |
| 1 | Number of referrals to a physician specialist | | | | | | (15-16) |
| 2 | Number of missed appointments | | | | | | (17-18) |
| 3 | Number of hospital admissions | | | | | | (19-20) |
| 4 | Number of Emergency Room visits | | | | | | (21-22) |
| 5 | Number of primary care providers seen in 6 mon (non OB) | MD/DO: | NP: | PA: | | | (23-28) |
| 6 | Number of referrals to other health care professionals | Dentist: | Mental Health: | Nutrition: | OT/PT: | Other:_____ | (29-38) |
| 7 | Number of calls | Advice Nurse: | MD/DO: | NP: | PA: | Other:_____ | (39-48) |
| | **Health Problem:** _____ | | (from initial visit only) | | | | (49-50) |
| 1 | Number of visits needed to resolve the problem: | | | | | | (51-52) |
| | | | Acute Injury | Acute Illness | Chronic Condition | Prevention | |
| 2 | Category: | | 1 | 2 | 3 | 4 | (53) |
| | | None | Questionable | Mild | Moderate | Major | |
| 3 | Symptoms: | 0 | 1 | 2 | 3 | 4 | (54) |
| | | None | Questionable | Mild | Moderate | Major | |
| 4 | Complications: | 0 | 1 | 2 | 3 | 4 | (55) |
| | | Disability: None | Disability: Mild | Disability: Moderate | Disability: Major | Threat to Life | |
| 5 | Prognosis (next 6 mon, w/o treatment): | 0 | 1 | 2 | 3 | 4 | (56) |
| | | No Need for Tx | Tx Questionable | Response to Tx: Good | Response to Tx: Questionable | Response to Tx: Poor | |
| 6 | Treatability: | 0 | 1 | 2 | 3 | 4 | (57) |

## *PCDP: Medical Record Review Form*
## *PAGE 2*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Subject Number:** _____ | | | | | | ____ |
| | **Health Problem:** _____ | | (from initial visit only) | | | | (58-59) |
| 1 | Number of visits needed to resolve the problem: | | | | | | (60-61) |
| | | | Acute Injury | Acute Illness | Chronic Condition | Prevention | |
| 2 | Category: | | 1 | 2 | 3 | 4 | (62) |
| | | None | Questionable | Mild | Moderate | Major | |
| 3 | Symptoms: | 0 | 1 | 2 | 3 | 4 | (63) |
| | | None | Questionable | Mild | Moderate | Major | |
| 4 | Complications: | 0 | 1 | 2 | 3 | 4 | (64) |
| | | Disability: None | Disability: Mild | Disability: Moderate | Disability: Major | Threat to Life | |
| 5 | Prognosis (next 6 mon, w/o treatment): | 0 | 1 | 2 | 3 | 4 | (65) |
| | | No Need for Tx | Tx Questionable | Response to Tx: Good | Response to Tx: Questionable | Response to Tx: Poor | |
| 6 | Treatability: | 0 | 1 | 2 | 3 | 4 | (66) |
| | **Health Problem:** _____ | | (from initial visit only) | | | | (67-68) |
| 1 | Number of visits needed to resolve the problem: | | | | | | (69-70) |
| | | | Acute Injury | Acute Illness | Chronic Condition | Prevention | |
| 2 | Category: | | 1 | 2 | 3 | 4 | (71) |
| | | None | Questionable | Mild | Moderate | Major | |
| 3 | Symptoms: | 0 | 1 | 2 | 3 | 4 | (72) |
| | | None | Questionable | Mild | Moderate | Major | |
| 4 | Complications: | 0 | 1 | 2 | 3 | 4 | (73) |
| | | Disability: None | Disability: Mild | Disability: Moderate | Disability: Major | Threat to Life | |
| 5 | Prognosis (next 6 mon, w/o treatment): | 0 | 1 | 2 | 3 | 4 | (74) |
| | | No Need for Tx | Tx Questionable | Response to Tx: Good | Response to Tx: Questionable | Response to Tx: Poor | |
| 6 | Treatability: | 0 | 1 | 2 | 3 | 4 | (75) |

# APPENDIX B

## VOLUNTARY AGREEMENT AFFIDAVIT

## VOLUNTEER AGREEMENT AFFIDAVIT

For use of this form, see AR 70-25 or AR 40-38; the proponent agency is OTSG

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN and home address will be used for identification and locating purposes. |
| Routine Uses: | The SSN and home address will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, adjudication of claims, and for the mandatory reporting of medical conditions as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of your SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

### PART A(1) - VOLUNTEER AFFIDAVIT

Volunteer Subjects in Approved Department of the Army Research Studies

Volunteers under the provisions of AR 40-38 and AR 70-25 are authorized all necessary medical care for injury or disease which is the proximate result of their participation in such studies.

I, _____ SSN _____ having full capacity to consent and having attained my _____ birthday, do hereby volunteer/give consent as legal representative for _____ to participate in ***Primary Care Demonstration Project: Measurement of Provider Practice Style and Client Outcomes*** under the direction of ***LTC Debbie Herman*** conducted at ***The Primary Care Clinics at Ft. Belvoir, Virginia***. The implications of my voluntary participation/consent as legal representative; duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by **Major Debra Mark or Dr. Vicki Byers, Fort Sam Houston, TX at (210) 916-8798 or 429-8798 DSN**.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights/the rights of the person I represent on study-related injury, I may contact ***the Post Judge Advocate at DSN 655-2712 or (703) 805-2712; Fort Belvoir, VA 22060-5901.***

I understand that I may at any time during the course of this study revoke my consent and withdraw/have the person I represent withdrawn from the study without further penalty or loss of benefits; however, I/the person I represent may be required [*military volunteer*] or requested [*civilian volunteer*] to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my/the person I represent's health and well-being. My/the person I represent's refusal to participate will involve no penalty or loss of benefits to which I am/the person I represent is otherwise entitled.

## VOLUNTEER AGREEMENT AFFIDAVIT (Cont'd.)

PART A(2)- ASSENT VOLUNTEER AFFIDAVIT (MINOR CHILD)

I, _____, SSN _____ having full capacity to assent and having attained my _____ birthday, do hereby volunteer for_____ to participate in _____ under the direction of _____ conducted at _____.

The implications of my voluntary participation; the nature, duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by _____.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights I may contact _____ at _____.

I understand that I may at any time during the course of this study revoke my assent and withdraw from the study without further penalty or loss of benefits; however, I may be requested to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my health and well-being. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.

PART B - TO BE COMPLETED BY INVESTIGATOR

INSTRUCTIONS FOR ELEMENTS OF INFORMED CONSENT: (Provide a detailed explanation in accordance with Appendix C, AR 40-38 or AR 70-25.)

NATURE OF THE STUDY

You are being asked to participate in this research study because you use a military primary care clinic for your health care. The purpose of the study is to measure changes in your health status and your satisfaction with military health care.

If you volunteer to participate, you will fill out and return six (6) questionnaires today, three (3) questionnaires approximately one week from today and five (5) questionnaires approximately six months from today. These questionnaires gather information about you such as age, gender, education, health status, satisfaction with health care services, symptoms you have today, and how you gain information from your health care provider.

At the six month follow-up your medical records will be requested from the clinic or outpatient office. If you maintain your own medical records, you should bring them with you. You will be asked to provide your name, social security number, address and telephone number on this form today. These identifiers will not appear on any questionnaire or be incorporated into the research record. The medical record review will be conducted by a research nurse who will preserve the confidentiality and integrity of the records. Records will not be photocopied. Records will be reviewed for your medical diagnosis and symptoms. This information will be transferred to a form in the research record.

There is no penalty or loss of benefits to which you are otherwise entitled if you do not volunteer for the study. If you participate in the study, you can withdraw from the study at any time.

DURATION OF THE STUDY

It will take you approximately one-half hour to one hour to complete the questionnaires at each time point. You will be filling out and returning the questionnaires at three different times during the study - today, approximately one week from today and approximately 6 months from today. The total time commitment for you to participate in the study is approximately 3 hours. You will need to return to the clinic at these times to see the researchers. You will be contacted by phone to be reminded of the six month follow-up.

POTENTIAL RISKS OR DISCOMFORTS

There is no known medical risk or discomfort associated with your participation in this study.

BENEFITS

You will not benefit directly from this study, but the information gained may help provide better health care.

CONFIDENTIALITY OF SUBJECT IDENTITY/RESEARCH RECORDS

Research records of your participation in the study will be maintained by the principal investigator and records will be kept in a locked room. These records may be reviewed by WRAMC Department of Clinical Investigation, the WRAMC Human Use Committee/Institutional Review Board, and/or regulatory agencies as part of their responsibilities for ensuring the protection of research volunteers, but confidentiality will be strictly maintained. You will not be identified by name in any publication or presentation resulting from this study.

CIRCUMSTANCES UNDER WHICH PARTICIPATION MAY BE TERMINATED WITHOUT YOUR CONSENT

Your participation may be terminated without your consent if health conditions or other conditions occur that might be dangerous or detrimental to you or your health; if military contingency requires it; or if you become ineligible for military medical care as authorized by Army regulation.

LIMITATIONS TO MEDICAL CARE

Medical care is limited and will be within the scope authorized for Department of Defense health care beneficiaries. Necessary medical care does not include domiciliary (home or nursing home) care.

RELEASE OF MEDICAL RECORDS

I **consent** to the release of my medical records to the Investigators _____ (*write in initials*).

## VOLUNTEER AGREEMENT AFFIDAVIT (Cont'd.)

You will be provided a copy of this consent form to take with you.

I do _____ do not _____ (*initial one*) consent to the inclusion of this form in my outpatient medical treatment record.

SIGNATURE OF VOLUNTEER | DATE | SIGNATURE OF LEGAL GUARDIAN (if volunteer is a minor)

PERMANENT ADDRESS OF VOLUNTEER | TYPED NAME OF WITNESS

SIGNATURE OF WITNESS | DATE

PHONE NUMBER:

# RELEASE OF MEDICAL RECORDS

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN will be used for identification and locating purposes. |
| Routine Uses: | The SSN will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, adjudication of claims, and for the mandatory reporting of medical condition as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of SSN is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

I **consent** to the release of my medical records to the Investigators _____ (*write in initials*) of the Primary Care Demonstration Project.

**My** social security number is_____.
My **sponsor's** social security number is_____ (*enter NA, if not applicable*).

I am (*fill in blank*):

_____ 01-19 child of an active duty or retired service member
_____ 20 active duty or retired service member
_____ 30-39 spouse or former spouse of active duty or retired service member
_____ 40/45 parent or stepparent of active duty or retired service member
_____ 50/55 parent-in-law of active duty or retired service member
_____ 60-69 other authorized family member or dependent of active duty or retired service member
_____ 90-95 beneficiary authorized by statute
_____ 99 other _____ (*write category in the blank*)

Printed Name _____

Signature _____ Date _____

# VOLUNTEER AGREEMENT AFFIDAVIT

For use of this form, see AR 70-25 or AR 40-38; the proponent agency is OTSG

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN and home address will be used for identification and locating purposes. |
| Routine Uses: | The SSN and home address will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, adjudication of claims, and for the mandatory reporting of medical conditions as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of your SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

## PART A(1)- VOLUNTEER AFFIDAVIT

Volunteer Subjects in Approved Department of the Army Research Studies

Volunteers under the provisions of AR 40-38 and AR 70-25 are authorized all necessary medical care for injury or disease which is the proximate result of their participation in such studies.

I, _____ SSN _____ having full capacity to consent and having attained my _____ birthday, do hereby volunteer/give consent as legal representative for _____ to participate in ***Primary Care Demonstration Project: Measurement of Provider Practice Style and Client Outcomes*** under the direction of ***LTC Debbie Herman*** conducted at ***The Primary Care Clinics at Ft. Belvoir, Virginia***. The implications of my voluntary participation/consent as legal representative; duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by **Major Debra Mark or Dr. Vicki Byers, Fort Sam Houston, TX at (210) 916-8798 or 429-8798 DSN**.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights/the rights of the person I represent on study-related injury, I may contact ***the Post Judge Advocate at DSN 655-2712 or (703) 805-2712; Fort Belvoir, VA 22060-5901.***

I understand that I may at any time during the course of this study revoke my consent and withdraw/have the person I represent withdrawn from the study without further penalty or loss of benefits; however, I/the person I represent may be required [*military volunteer*] or requested [*civilian volunteer*] to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my/the person I represent's health and well-being. My/the person I represent's refusal to participate will involve no penalty or loss of benefits to which I am/the person I represent is otherwise entitled.

VOLUNTEER AGREEMENT AFFIDAVIT (Cont'd.)

PART A(2)- ASSENT VOLUNTEER AFFIDAVIT (MINOR CHILD)

I, _____, SSN _____ having full capacity to assent and having attained my _____ birthday, do hereby volunteer for_____ to participate in _____ under the direction of _____ conducted at _____.

The implications of my voluntary participation; the nature, duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by _____.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights I may contact _____ at _____.

I understand that I may at any time during the course of this study revoke my assent and withdraw from the study without further penalty or loss of benefits; however, I may be requested to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my health and well-being. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.

PART B - TO BE COMPLETED BY INVESTIGATOR

INSTRUCTIONS FOR ELEMENTS OF INFORMED CONSENT: (Provide a detailed explanation in accordance with Appendix C, AR 40-38 or AR 70-25.)

NATURE OF THE STUDY

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If you volunteer to participate, you will fill out and return six (6) questionnaires today, three (3) questionnaires approximately one week from today and five (5) questionnaires approximately six months from today. These questionnaires gather information about you such as age, gender, education, health status, satisfaction with health care services, symptoms you have today, and how you gain information from your health care provider.

At the six month follow-up your medical records will be requested from the clinic or outpatient office. If you maintain your own medical records, you should bring them with you. You will be asked to provide your name, social security number, address and telephone number on this form today. These identifiers will not appear on any questionnaire or be incorporated into the research record. The medical record review will be conducted by a research nurse who will preserve the confidentiality and integrity of the records. Records will not be photocopied. Records will be reviewed for your medical diagnosis and symptoms. This information will be transferred to a form in the research record.

There is no penalty or loss of benefits to which you are otherwise entitled if you do not volunteer for the study. If you participate in the study, you can withdraw from the study at any time.

DURATION OF THE STUDY

It will take you approximately one-half hour to one hour to complete the questionnaires at each time point. You will be filling out and returning the questionnaires at three different times during the study - today, approximately one week from today and approximately 6 months from today. The total time commitment for you to participate in the study is approximately 3 hours. You will need to return to the clinic at these times to see the researchers. You will be contacted by phone to be reminded of the six month follow-up.

POTENTIAL RISKS OR DISCOMFORTS

There is no known medical risk or discomfort associated with your participation in this study.

BENEFITS

You will not benefit directly from this study, but the information gained may help provide better health care.

CONFIDENTIALITY OF SUBJECT IDENTITY/RESEARCH RECORDS

Research records of your participation in the study will be maintained by the principal investigator and records will be kept in a locked room. These records may be reviewed by WRAMC Department of Clinical Investigation, the WRAMC Human Use Committee/Institutional Review Board, and/or regulatory agencies as part of their responsibilities for ensuring the protection of research volunteers, but confidentiality will be strictly maintained. You will not be identified by name in any publication or presentation resulting from this study.

CIRCUMSTANCES UNDER WHICH PARTICIPATION MAY BE TERMINATED WITHOUT YOUR CONSENT

Your participation may be terminated without your consent if health conditions or other conditions occur that might be dangerous or detrimental to you or your health; if military contingency requires it; or if you become ineligible for military medical care as authorized by Army regulation.

LIMITATIONS TO MEDICAL CARE

Medical care is limited and will be within the scope authorized for Department of Defense health care beneficiaries. Necessary medical care does not include domiciliary (home or nursing home) care.

RELEASE OF MEDICAL RECORDS

I **consent** to the release of my medical records to the Investigators _____ (*write in initials*).

## VOLUNTEER AGREEMENT AFFIDAVIT (Cont'd.)

You will be provided a copy of this consent form to take with you.

I do _____ do not _____ (*initial one*) consent to the inclusion of this form in my outpatient medical treatment record.

SIGNATURE OF VOLUNTEER | DATE | SIGNATURE OF LEGAL GUARDIAN (if volunteer is a minor)

PERMANENT ADDRESS OF VOLUNTEER | TYPED NAME OF WITNESS

SIGNATURE OF WITNESS | DATE

PHONE NUMBER:

## VOLUNTEER AGREEMENT AFFIDAVIT

For use of this form, see AR 40-38; the proponent agency is OTSG

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN and home address will be used for identification and locating purposes. |
| Routine Uses: | The SSN and home address will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, adjudication of claims, and for the mandatory reporting of medical condition as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

### PART A(1)- VOLUNTEER AFFIDAVIT

Volunteer Subjects in Approved Department of the Army Research Studies

Volunteers under the provisions of AR 40-38 and AR 70-25 are authorized all necessary medical care for injury or disease which is the proximate result of their participation in such studies.

I, _____ SSN _____ having full capacity to consent and having attained my _____ birthday, do hereby volunteer/give consent as legal representative for _____ to participate in ***Primary Care Demonstration Project: Measurement of Provider Practice Style and Client Outcomes*** under the direction of ***COL Laurie Szoka*** conducted at ***The Primary Care Clinics at Ft. Bragg, NC***. The implications of my voluntary participation/consent as legal representative; duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by **Major Debra Mark or Dr. Vicki Byers**.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights/the rights of the person I represent on study-related injury, I may contact ***the Center Judge Advocate at DSN 239-2376 (910) 432-2376; Womack Army Medical Center, Fort Bragg, NC 28307.***

I understand that I may at any time during the course of this study revoke my consent and withdraw/have the person I represent withdrawn from the study without further penalty or loss of benefits; however, I/the person I represent may be required [*military volunteer*] or requested [*civilian volunteer*] to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my/the person I represent's health and well-being. My/the person I represent's refusal to participate will involve no penalty or loss of benefits to which I am/the person I represent is otherwise entitled.

PART A(2)- ASSENT VOLUNTEER AFFIDAVIT (MINOR CHILD)

I, _____, SSN _____ having full capacity to assent and having attained my _____ birthday, do hereby volunteer for_____ to participate in *[Title of Study]* under the direction of *[Name of Principal Investigator]* conducted at *[Name of Institution]*.

The implications of my voluntary participation; the nature, duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by _____.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights I may contact *[Name of Principal Investigator]* at *[Name of Institution]*.

I understand that I may at any time during the course of this study revoke my assent and withdraw from the study without further penalty or loss of benefits; however, I may be requested to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my health and well-being. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.

PART B - TO BE COMPLETED BY INVESTIGATOR

You have been invited to participate in a clinical investigational/research study conducted at ***Primary Care Clinics at Ft. Bragg, NC***. It is very important that you read and understand the following general principles that apply to all participants in our studies, whether normal or patient volunteers: (a) your participation is entirely voluntary; (b) you may withdraw from participation in this study or any part of the study at any time; (c) refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled; (d) after you read the explanation, please feel free to ask any questions that will allow you to clearly understand the nature of the study.

PURPOSE OF THE STUDY AND PROCEDURES

You are being asked to participate in this research study because you are a provider in a military primary care clinic. The purpose of the study is to measure your individual practice style and its relationship to client outcomes.

If you volunteer to participate, you will fill out and return seven (7) questionnaires at the beginning of the study.

There is no penalty if you do not volunteer for the study and your decision to participate or not will remain confidential. If you do participate in the study, you can withdraw from the study at any time.

DURATION OF PARTICIPATION

It will take approximately one hour for you to complete the seven (7) questionnaires. You will be filling out and returning the questionnaires once at the start of the study. The total time commitment for you to participate in the study is approximately 1 hour.

POTENTIAL RISKS OR DISCOMFORTS

There is no known medical risk or discomfort associated with your participation in this study.

BENEFITS

You will not benefit directly from this study, but the information gained will help provide better health care.

CONFIDENTIALITY OF SUBJECT IDENTITY/RESEARCH RECORDS

Research records of your participation in the study will be maintained by the principal investigator and records will be in kept in a locked room. These records may be reviewed by the Department of Clinical Investigations and/or the Human Use Committee/Institutional Review Board as part of their responsibilities for ensuring the protection of research volunteers, but confidentiality will be strictly maintained. You will not be identified by name in any publication or presentation resulting from this study.

LIMITATIONS TO MEDICAL CARE

This study does not influence your medical care.

ELIGIBILITY OF FEDERAL GOVERNMENT OR CONTRACT EMPLOYEES

Participation performed during your regularly scheduled duty day is considered constructive duty.

Participation outside of your regularly scheduled duty or during leave is considered voluntary and no additional financial compensation will be provided.

POINT OF CONTACT
COL Laurie Szoka
239-4304/9910 DSN
910-432-4304/9910 Commercial

* IF THERE IS ANY PORTION OF THIS EXPLANATION THAT YOU DO NOT UNDERSTAND, ASK THE INVESTIGATOR NOW.*

You are deciding whether or not to take part in this study. If you sign this form, it means that you have decided to volunteer after reading and understanding all the information on the form.



VOLUNTEER'S INITIALS _____
WITNESS'S INITIALS _____

You will be provided a copy of this consent form to take with you.

I do _____ do not _____ (*initial one*) consent to the inclusion of this form in my outpatient medical treatment record.

_____ _____
Signature of Volunteer Date

MAJ Debra D. Mark
Dr. Vicki L. Byers
Dr. Mary Z. Mays

_____ _____
Permanent Address of Volunteer Signature of Witness Date

_____
Phone Number of Volunteer

RELEASE OF MEDICAL RECORDS

I consent to the release of my medical records to the Investigators _____ (*write in initials*).

My social security number is_____.
My sponsor's social security number is_____ (*enter NA, if not applicable*).

I am (*fill in blank*):

| | | |
|---|---|---|
| _____ | 01-19 | child of an active duty or retired service member |
| _____ | 20 | active duty or retired service member |
| _____ | 30-39 | spouse or former spouse of active duty or retired service member |
| _____ | 40/45 | parent or stepparent of active duty or retired service member |
| _____ | 50/55 | parent-in-law of active duty or retired service member |
| _____ | 60-69 | other authorized family member or dependent of active duty or retired service member |
| _____ | 90-95 | beneficiary authorized by statute |
| _____ | 99 | other _____ (*write category in the blank*) |

POINT OF CONTACT
COL Laurie Szoka
239-4304/9910 DSN
910-432-4304/9910 Commercial

* IF THERE IS ANY PORTION OF THIS EXPLANATION THAT YOU DO NOT UNDERSTAND, ASK THE INVESTIGATOR NOW.*

You are deciding whether or not to take part in this study. If you sign this form, it means that you have decided to volunteer after reading and understanding all the information on the form.

You will be provided a copy of this consent form to take with you.

I do _____ do not _____ (*initial one*) consent to the inclusion of this form in my outpatient medical treatment record.

_____ _____
Signature of Volunteer Date

MAJ Debra D. Mark / Dr. Vicki L. Byers

_____ _____
Permanent Address of Volunteer Signature of Witness Date

_____
Phone Number of Volunteer

## VOLUNTEER AGREEMENT AFFIDAVIT

For use of this form, see AR 40-38; the proponent agency is OTSG

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN and home address will be used for identification and locating purposes. |
| Routine Uses: | The SSN and home address will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, adjudication of claims, and for the mandatory reporting of medical condition as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

### PART A(1) - VOLUNTEER AFFIDAVIT

Volunteer Subjects in Approved Department of the Army Research Studies

Volunteers under the provisions of AR 40-38 and AR 70-25 are authorized all necessary medical care for injury or disease which is the proximate result of their participation in such studies.

I, _____ SSN _____ having full capacity to consent and having attained my _____ birthday, do hereby volunteer/give consent as legal representative for _____ to participate in ***Primary Care Demonstration Project: Measurement of Provider Practice Style and Client Outcomes*** under the direction of ***COL Laurie Szoka*** conducted at ***The Primary Care Clinics at Ft. Bragg, NC***. The implications of my voluntary participation/consent as legal representative; duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by **Major Debra Mark or Dr. Vicki Byers**.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights/the rights of the person I represent on study-related injury, I may contact ***the Center Judge Advocate at DSN 239-2376 (910) 432-2376; Womack Army Medical Center, Fort Bragg, NC 28307.***

I understand that I may at any time during the course of this study revoke my consent and withdraw/have the person I represent withdrawn from the study without further penalty or loss of benefits; however, I/the person I represent may be required [*military volunteer*] or requested [*civilian volunteer*] to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my/the person I represent's health and well-being. My/the person I represent's refusal to participate will involve no penalty or loss of benefits to which I am/the person I represent is otherwise entitled.

PART A(2)- ASSENT VOLUNTEER AFFIDAVIT (MINOR CHILD)

I, _____, SSN _____ having full capacity to assent and having attained my _____ birthday, do hereby volunteer for_____ to participate in *[Title of Study]* under the direction of *[Name of Principal Investigator]* conducted at *[Name of Institution]*.

The implications of my voluntary participation; the nature, duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by _____.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights I may contact *[Name of Principal Investigator]* at *[Name of Institution]*.

I understand that I may at any time during the course of this study revoke my assent and withdraw from the study without further penalty or loss of benefits; however, I may be requested to undergo certain examination if, in the opinion of the attending physician, such examinations are necessary for my health and well-being. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.

PART B - TO BE COMPLETED BY INVESTIGATOR

You have been invited to participate in a clinical investigational/research study conducted at ***Primary Care Clinics at Ft. Bragg, NC***. It is very important that you read and understand the following general principles that apply to all participants in our studies, whether normal or patient volunteers: (a) your participation is entirely voluntary; (b) you may withdraw from participation in this study or any part of the study at any time; (c) refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled; (d) after you read the explanation, please feel free to ask any questions that will allow you to clearly understand the nature of the study.

PURPOSE OF THE STUDY AND PROCEDURES

You are being asked to participate in this research study because you are a provider in a military primary care clinic. The purpose of the study is to measure your individual practice style and its relationship to client outcomes.

If you volunteer to participate, you will fill out and return seven (7) questionnaires at the beginning of the study.

There is no penalty if you do not volunteer for the study and your decision to participate or not will remain confidential. If you do participate in the study, you can withdraw from the study at any time.

DURATION OF PARTICIPATION

It will take approximately one hour for you to complete the seven (7) questionnaires. You will be filling out and returning the questionnaires once at the start of the study. The total time commitment for you to participate in the study is approximately 1 hour.

POTENTIAL RISKS OR DISCOMFORTS

There is no known medical risk or discomfort associated with your participation in this study.

BENEFITS

You will not benefit directly from this study, but the information gained will help provide better health care.

CONFIDENTIALITY OF SUBJECT IDENTITY/RESEARCH RECORDS

Research records of your participation in the study will be maintained by the principal investigator and records will be in kept in a locked room. These records may be reviewed by the Department of Clinical Investigations and/or the Human Use Committee/Institutional Review Board as part of their responsibilities for ensuring the protection of research volunteers, but confidentiality will be strictly maintained. You will not be identified by name in any publication or presentation resulting from this study.

LIMITATIONS TO MEDICAL CARE

This study does not influence your medical care.

ELIGIBILITY OF FEDERAL GOVERNMENT OR CONTRACT EMPLOYEES

Participation performed during your regularly scheduled duty day is considered constructive duty.

Participation outside of your regularly scheduled duty or during leave is considered voluntary and no additional financial compensation will be provided.

POINT OF CONTACT
COL Laurie Szoka
239-4304/9910 DSN
910-432-4304/9910 Commercial

* IF THERE IS ANY PORTION OF THIS EXPLANATION THAT YOU DO NOT UNDERSTAND, ASK THE INVESTIGATOR NOW.*

You are deciding whether or not to take part in this study. If you sign this form, it means that you have decided to volunteer after reading and understanding all the information on the form.


VOLUNTEER'S INITIALS _____
WITNESS'S INITIALS _____

You will be provided a copy of this consent form to take with you.

I do _____ do not _____ (*initial one*) consent to the inclusion of this form in my outpatient medical treatment record.

_____ _____
Signature of Volunteer Date

MAJ Debra D. Mark
Dr. Vicki L. Byers
Dr. Mary Z. Mays

_____ _____
Permanent Address of Volunteer Signature of Witness Date

_____
Phone Number of Volunteer

# VOLUNTEER AGREEMENT AFFIDAVIT

For use of this form, see AR 70-25 or AR 40-38; the proponent agency is OTSG

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN and home address will be used for identification and locating purposes. |
| Routine Uses: | The SSN and home address will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, teaching, adjudication of claims, and for the mandatory reporting of medical condition as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of your SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

## PART A - VOLUNTEER AFFIDAVIT

Volunteer Subjects in Approved Department of the Army Research Studies

Volunteers under the provisions of AR 40-38 and AR 70-25 are authorized all necessary medical care for injury or disease which is the proximate result of their participation in such studies.

I, _____ SSN _____ having full capacity to consent and having attained my _____ birthday, do hereby volunteer to participate in the research protocol **Primary Care Demonstration Project: Measurement of Provider Practice Styles and Client Outcomes** under the direction of LTC Jack W. Saye, R.N., M.S.N., conducted at Madigan Army Medical Center.

The implications of my voluntary participation; the nature, duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by _____.

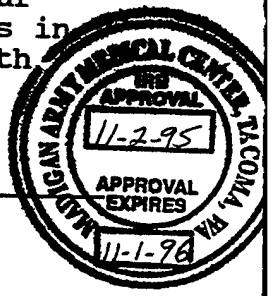
I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. **Should any further questions arise concerning my rights on study-related injury I may contact the Center Judge Advocate at Madigan Army Medical Center, (206) 968-1525.**

I understand that I may at any time during the course of this study revoke my consent and withdraw from the study without further penalty or loss of benefits; however, I may be required (military volunteer) or requested (civilian volunteer) to undergo certain examinations if, in the opinion of the attending physician, such examinations are necessary for my health and well-being. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.

## PART B - EXPLANATION OF WHAT IS TO BE DONE

**INTRODUCTION:** You have been invited to participate in a clinical research study conducted at Madigan Army Medical Center. Participation is entirely voluntary and you may withdraw from the study at any time without penalty or loss of benefits to which you are otherwise entitled.

**PURPOSE:** You are being asked to participate in this research study because you use a military primary care clinic for your health care. The purpose of the study is to measure changes in your health status and your satisfaction with military health care.



**PROCEDURES:** If you volunteer to participate in the study, you will fill out and return six (6) questionnaires today, three (3) questionnaires approximately one week from today and five (5) questionnaires approximately six months from today. These questionnaires are designed to gather information about you such as age, gender, education, health status, satisfaction with health care services, symptoms you have today, and how you obtain information from your health care provider. It will take you approximately one-half hour to one hour to complete the questionnaires at each time point. You will need to return to the clinic at each of these times to see the researchers. You will be contacted by phone to remind you of the six month follow-up visit.

Note: The investigators will need to look at your medical records to obtain information on your symptoms and medical diagnosis. By signing this form you are agreeing to the release of your medical records to the investigators. The medical records will be reviewed for your symptoms and medical diagnosis and this information will be transferred to a form in your research record. The medical record review will be conducted by a research nurse who will preserve the confidentiality of the records. Records will not be photocopied.

If you are a dependent of an active duty or retired service member, you are also being asked to enter the last four numbers of your sponsor's Social Security number in the space indicated so that we can access your medical records.

Last 4 numbers of Sponsor's Social Security # _____

You are also being asked to indicate in the space below which category of dependent you are:

____ 10-19 Child of active duty or retired service member
____ 20 Active duty or retired service member
____ 30-39 Spouse or former spouse of active duty or retired service member
____ 40-45 Parent or stepparent of active duty or retired service member
____ 50-55 Parent-in-law of active duty or retired service member
____ 60-69 Other authorized family member or dependent of active duty service member
____ 90-95 Beneficiary authorized by statute
____ 99 Other _____ (write in category in blank space)

**BENEFITS:** You will not benefit directly from this study, but the information gained may help to provide better health care at your medical clinic.

**RISKS AND DISCOMFORTS:** There are no known medical risks or discomforts associated with participation in this study.

**ALTERNATIVE TO PARTICIPATION:** This research study does not involve medical treatment. You are only being asked to fill out the questionnaires. If you do not wish to participate, there will be no effect on the treatment you receive today.

**CONFIDENTIALITY:** Research records of your participation in this study will be maintained by the principal investigator and will be kept in a locked room. Records from this study will be available for review by members of the Institutional Review Board at Madigan and by representatives of the Food and Drug Administration. Otherwise, only the investigators conducting this study will have access to the records from this study. Information gained from this study may be used as part of a scientific publication, but you will in no way be personally identified.

**OTHER INFORMATION:** Significant findings that occur during this study that might affect your decision to participate in the study will be discussed with you. The results of the research will be made available to you if you wish and may be obtained from LTC Saye. Your participation in this study may be terminated without your consent if conditions occur which might make your continued participation dangerous or detrimental to your health; or if military contingency requires it; or if you become ineligible for military care as authorized by Army regulation.

If you should require medical care for injuries or disease which result from participation in this study, the medical care to which you will be entitled is the same as that to which you are already entitled as a DoD health care beneficiary. This does not include domiciliary or nursing home care.

You are encouraged to ask any questions, at any time, that will help you to understand how this study will be performed and/or how it will affect you. You may LTC Saye at (206) 968-1239.

You will be given a copy of this consent document for your records.

IF THERE IS ANY PORTION OF THIS EXPLANATION THAT YOU DO NOT UNDERSTAND, ASK THE INVESTIGATOR BEFORE SIGNING THIS FORM.

I do ☐ do not ☐ (check one & initial) consent to the inclusion of this form in my outpatient medical treatment record.

| SIGNATURE OF VOLUNTEER | DATE | |
|---|---|---|
| PERMANENT ADDRESS OF VOLUNTEER | TYPED NAME OF WITNESS<br><br>SIGNATURE OF WITNESS | DATE SIGNED |

# VOLUNTEER AGREEMENT AFFIDAVIT

For use of this form, see AR 70-25 or AR 40-38; the proponent agency is OTSG

PRIVACY ACT OF 1974

| | |
|---|---|
| Authority: | 10 USC 3013, 44 USC 3101 and 10 USC 1071-1087 |
| Principle Purpose: | To document voluntary participation in the Clinical Investigation and Research Program. SSN and home address will be used for identification and locating purposes. |
| Routine Uses: | The SSN and home address will be used for identification and locating purposes. Information derived from the study will be used to document the study; implementation of medical programs, teaching, adjudication of claims, and for the mandatory reporting of medical condition as required by law. Information may be furnished to Federal, State and local agencies. |
| Disclosure: | The furnishing of your SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this investigational study. |

## PART A - VOLUNTEER AFFIDAVIT

Volunteer Subjects in Approved Department of the Army Research Studies

Volunteers under the provisions of AR 40-38 and AR 70-25 are authorized all necessary medical care for injury or disease which is the proximate result of their participation in such studies.

I, _____ SSN _____ having full capacity to consent and having attained my _____ birthday, do hereby volunteer to participate in the research protocol **Primary Care Demonstration Project: Measurement of Provider Practice Styles and Client Outcomes** under the direction of LTC Jack W. Saye, R.N., M.S.N., conducted at Madigan Army Medical Center.

The implications of my voluntary participation; the nature, duration and purpose of the research study; the methods and means by which it is to be conducted; and the inconveniences and hazards that may reasonably be expected have been explained to me by _____.

I have been given an opportunity to ask questions concerning this investigational study. Any such questions were answered to my full and complete satisfaction. **Should any further questions arise concerning my rights on study-related injury I may contact the Center Judge Advocate at Madigan Army Medical Center, (206) 968-1525.**

I understand that I may at any time during the course of this study revoke my consent and withdraw from the study without further penalty or loss of benefits; however, I may be required (military volunteer) or requested (civilian volunteer) to undergo certain examinations if, in the opinion of the attending physician, such examinations are necessary for my health and well-being. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled.

## PART B - EXPLANATION OF WHAT IS TO BE DONE

**INTRODUCTION:** You have been invited to participate in a clinical research study conducted at Madigan Army Medical Center. Participation is entirely voluntary and you may withdraw from the study at any time without penalty or loss of benefits to which you are otherwise entitled.

**PURPOSE:** You are being asked to participate in this research study because you are a provider in a military primary care clinic. The purpose of the study is to measure your individual practice style and its relationship to client outcomes.

**PROCEDURES:** If you volunteer to participate in the study, you will fill out and return seven (7) questionnaires at the beginning of the study. It will take you approximately one hour to complete the questionnaires.

MADIGAN ARMY MEDICAL CENTER, TACOMA, WA
IRB APPROVAL
11-2-95
APPROVAL EXPIRES
11-1-96

**ELIGIBILITY OF FEDERAL GOVERNMENT OR CONTRACT EMPLOYEES TO PARTICIPATE:** Participation performed during your regularly scheduled duty day is considered constructive duty. Participation outside of your regularly scheduled duty day or during leave is considered voluntary and no additional financial compensation will be provided.

**BENEFITS:** You will not benefit directly from this study, but the information gained may help to provide better health care in the Primary Health Care Clinic.

**RISKS AND DISCOMFORTS:** There are no known medical risks or discomforts associated with participation in this study.

**ALTERNATIVE TO PARTICIPATION:** This research study does not involve medical treatment. You are only being asked to fill out the questionnaires. If you do not participate there will be no effect on your status as a provider at this hospital.

**CONFIDENTIALITY:** Research records of your participation in this study will be maintained by the principal investigator and will be kept in a locked room. Records from this study will be available for review by members of the Institutional Review Board at Madigan and by representatives of the Food and Drug Administration. Otherwise, only the investigators conducting this study will have access to the records from this study. Information gained from this study may be used as part of a scientific publication, but you will in no way be personally identified.

**OTHER INFORMATION:** Significant findings that occur during this study that might affect your decision to participate in the study will be discussed with you. The results of the research will be made available to you if you wish and may be obtained from LTC Saye. Complete results may not be known for several years.

Your participation in this study may be terminated without your consent if conditions occur which might make your continued participation dangerous or detrimental to your health; or if military contingency requires it; or if you become ineligible for military care as authorized by Army regulation.

If you should require medical care for injuries or disease which result from participation in this study, the medical care to which you will be entitled is the same as that to which you are already entitled as a DoD health care beneficiary. This does not include domiciliary or nursing home care.

You are encouraged to ask any questions, at any time, that will help you to understand how this study will be performed and/or how it will affect you. You may LTC Saye at (206) 968-1239.

You will be given a copy of this consent document for your records.

**IF THERE IS ANY PORTION OF THIS EXPLANATION THAT YOU DO NOT UNDERSTAND, ASK THE INVESTIGATOR BEFORE SIGNING THIS FORM.**

I do ☐ do not ☐ (check one & initial) consent to the inclusion of this form in my outpatient medical treatment record.

| SIGNATURE OF VOLUNTEER | DATE | |
|---|---|---|
| PERMANENT ADDRESS OF VOLUNTEER | TYPED NAME OF WITNESS<br><br>SIGNATURE OF WITNESS DATE SIGNED | |

Glossary

| | |
|---|---|
| Autonomy - | an individual's or a discipline's ability to self-regulate. |
| Client - | an individual who comes to the primary care for treatment for a health problem. |
| Client Outcomes - | see client satisfaction and health outcomes. |
| Client Satisfaction - | health care recipients' reaction to salient aspects of his/her health care experience. |
| Client Mix - | the combination of clients who vary in severity, demographics, and disease presentation. |
| Collaboration - | to work together, especially in a joint intellectual effort. Critical attributes include sharing in planning, decision-making, problem-solving, goal setting, and responsibility. It also includes cooperating, coordinating, and communicating openly. |
| Confidence in Skills - | a provider's self-reliance in clinical decision-making and professional skills or a provider's belief in his/her ability to perform to a standard. |
| Continuity of Care - | a basic tenet of health care which suggests that a long-term relationship with a single provider fosters the integrated, holistic provision of health care services. |
| Consultation - | meeting of two or more providers to evaluate the nature and progress of disease, usually for a particular client. |
| Deprofessionalization - | attenuation or deletion of one or more of the three components which define a profession: autonomy, command of a body of knowledge not readily accessible to the public, and an empathetic service orientation. |
| Functional Status - | see health status |
| Gatekeeper - | a basic tenet of managed care which assigns the primary health care provider the role of controlling access to health care, including specialty care, nursing care, and inpatient care. |
| Health Status - | overall health condition of the individual including components of physical, mental, social, and general health. Health status can be measured as a change in overt behavior over time or as a change in perceived well-being. |
| Health Outcomes - | overall changes in clients' current health that can be attributed to antecedent health care practices. |

Holistic Practice Model - a philosophy which emphasizes the promotion of health and wellness through an integration of the physical, psychological, social, cultural, and spiritual dimensions.

Information giving - process of supplying facts and expert opinion that occurs throughout the provider-client interaction and is characterized by a continuum of provider behavior ranging from underdisclosure to overdisclosure.

Information seeking - process of soliciting facts and expert opinion that occurs throughout the health care provider-client interaction and is characterized by a continuum of client behaviors ranging from avoidance to hypervigilance.

Job Satisfaction - provider satisfaction with the content of work and the work setting.

Medical Visit - a meeting with a provider to discuss and treat a health problem.

Medicine - the art and science concerned with disease in all its relation (Stedman, 1990, p. 931).[1]

Outcomes of Care - see Health Outcomes

Practice Model - unique body of knowledge, skills, and experiences that form the basis for clinical decisions.

Practice Patterns - The application of a practice model, to include practice style, choice of client mix, and use of resources.

Physiological/Biological Practice Model - a philosophy which emphasizes the diagnosis, treatment, and curing of disease.

Primary Care - the provision of integrated, accessible health care services by practitioners who are accountable for addressing a large majority of personal health needs, developing a sustained partnership with clients, and practicing in the context of family and community.

Process of Care - set of activities that occurs between provider and client.

Profession - members practice autonomously, possess command of a body of knowledge not readily accessible to the public, and maintain an empathetic service orientation.

Provider - member of the health care team that initiates and directs care (physician, nurse practitioner, or physician assistant).

Provider-Client Interaction - communication process in which provider and client exchange information about a health problem.

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[1] *Stedman's medical dictionary.* (1990). 25th Edition Illustrated. Baltimore, MD: Williams & Wilkins.

| | |
|---|---|
| Provider Satisfaction - | provider's reaction to salient aspects of his/her health care delivery experience including work content and setting. |
| Quality of Care - | the effectiveness of accomplishing or producing client health and satisfaction. |
| Structure of Care - | the stable characteristics of the providers of care, the resources available, and the organizational setting within which they work. |
| Subscale - | a group of items on a questionnaire which measures a single dimension. |

Acronyms

| | |
|---|---|
| $\alpha$ - | Probability of Type I error |
| AAPA - | American Academy of Physician Assistants |
| AHEC - | Ad Hoc Education Committee |
| AIDS - | Acquired Immunodeficiency Syndrome |
| AMA - | American Medical Association |
| AMEDD - | Army Medical Department |
| APACHE - | Acute Physiology and Chronic Health Evaluation |
| AR - | Army Regulation |
| CHAMPUS - | Civilian Health and Medical Program of the Uniformed Services |
| CHCS - | Composite Health Care System |
| CHES - | Center for Healthcare Education and Studies |
| CONUS - | Continental United States |
| COOP - | Dartmouth Primary Care Cooperative |
| CPU - | Collaborative Practice Unit |
| DEERS - | Defense Eligibility Reporting System |
| DO - | Doctor of Osteopathy |
| DOD - | Department of Defense |
| DRG - | Diagnostic Related Group |
| Ed.D. - | Doctorate in Education |
| f - | Effect size index |
| F - | Analysis of Variance test |
| FAAN - | Fellow of the American Academy of Nursing |
| FNP - | Family Nurse Practitioner |
| FY - | Fiscal Year |
| GHAA - | Group Health Association of America |
| GMENAC - | Graduate Medical Education National Advisory Committee |
| HMO - | Health Maintenance Organization |
| HSD - | Honestly Significant Difference |
| ICU - | Intensive Care Unit |
| LSD - | Least Significant Difference |
| MD - | Medical Doctor |
| MD/DO - | Physician |
| MEDCOM - | U.S. Army Medical Command |

| | |
|---|---|
| MICU - | Medical Intensive Care Unit |
| MOS - | Medical Outcome Study |
| MMTF - | Military Medical Treatment Facility |
| N - | Sample size |
| n - | Sub-sample or group size |
| NCCPA - | National Commission on Certification of Physician Assistants |
| NICU - | Neonatal Intensive Care Unit |
| NJPC - | National Joint Practice Commission |
| non-US - | Other than the United States |
| NP - | Nurse practitioner |
| OB/GYN - | Obstetrics/Gynecology |
| OTA - | Office of Technology Assessment |
| p - | Probability the result of a statistical test would occur by chance |
| PA - | Physician assistant |
| PCDP - | Primary Care Demonstration Project |
| PPO - | Preferred Provider Organization |
| PRC - | Company name, not an acronym |
| RN - | Registered Nurse |
| SAS/STAT - | Statistical Analysis System/Statistical Modules of SAS Institute, Inc. |
| SCU - | Special Care Unit |
| SD - | Standard deviation |
| SPARC - | Company name, not an acronym |
| SUN - | Sun Microsystems Computer Corporation |
| u - | Degrees of freedom for power calculations |
| VA - | Veterans Administration |
| v2.5 - | Version 2.5 |
| v6.11 - | Version 6.11 |

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