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A STUDY TO DETERMINE
THE BEST METHOD OF DELIVERING
NUTRITION EDUCATION SERVICES AT
DARNALL ARMY COMMUNITY HOSPITAL

A Graduate Research Project
Submitted to the Faculty of
Baylor University
in Partial Fulfillment of the
Requirements for the Degree

of
Master of Health Administration
by
Captain Dale E. Hill, SP
August 1988

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I. INTRODUCTION

Conditions Which Prompted The Study

The mission of the Army hospital Nutrition Care Division (NCD) is "to provide comprehensive nutritional care to provide safe, wholesome foods including, as appropriate, special diets, to patients and other personnel authorized to subsist in the hospital food service facilities; dietary counseling for patients; the provision of nutrition education for the military community; and applied research" (AR 40-2 1981). To accomplish this mission, the NCD is divided into two branches (see Appendix A).¹ The Production and Service Branch is responsible for all activities involved in the procurement of subsistence, and preparation and service of both patient and staff meals while the Clinical Dietetics Branch provides dietary counseling, and management of inpatient diet orders and related activities. The Nutrition Clinic, an activity within the Clinical Dietetics Branch, provides nutrition education services to outpatients and the military community.

At Darnall Army Community Hospital (DACH) the demand for outpatient and community nutrition education services exceeds authorized staffing capabilities. In calendar year 1987, a staff of three dietitians accomplished an average of 1735 monthly outpatient visits. In calculating required Nutrition Clinic manpower, outpatient visits are converted to "equivalents" which are intended to be an estimate of the number of hours spent in the

preparation, provision, evaluation, and documentation of nutrition education services provided. In calendar year 1987, the Nutrition Clinic averaged 1025 equivalents per month. The Staffing Guide for US Army Medical Department Activities (DA Pam 570-557, C 4 1979) allows for one dietitian for every 200 equivalents. Accordingly, the required number of dietitians in the Nutrition Clinic is five as opposed to the two actually assigned. In addition to these two dietitians, the Chief of the Clinical Dietetics Branch provides the majority of the community nutrition education services and assists in Nutrition Clinic activities. Staffing of the Clinical Dietetics Branch is depicted in Table 1.

	Recognized Requirements	Authorizations	Actual
<u>Clinical Dietetics Office</u>			
Dietitians	1	1	2
Medical Aides	3	2	2
Diet Techs	<u>2</u>	<u>2</u>	<u>2</u>
Total	6	5	6
<u>Nutrition Clinic</u>			
Dietitians	3	2	2*
Grand Total	<u>9</u>	<u>7</u>	<u>8</u>
* Includes one full-time temporary employee			

Table 1: Clinical Dietetics Branch Staffing

Over 75% of all outpatients are seen in groups. Community

nutrition education services are provided in lecture format as they are in the Nutrition Clinic. In addition, the clinic outpatients are interviewed individually to determine their particular dietary needs and to individualize diet plans. Because lecture format provides no mechanism to evaluate each person's comprehension of the information provided, the dietitians question the effectiveness of their efforts.

With the increasing emphasis on health promotion and disease prevention, demand for nutrition education services has steadily increased, first with the wellness programs and presently with the Army health promotion initiative. With current budget reductions and civilian hiring freezes, additional allocations and overhires may be difficult to acquire. The Nutrition Clinic's contribution to the hospital's workload statistics is minor when compared with other activities. This places it in an unfavorable position for justifying and obtaining additional personnel resources while making it vulnerable to personnel cuts.

Problem Statement

To determine how to best deliver nutrition education services at Darnall Army Community Hospital.

Objectives

1. Determine current directives for, and initiatives in the delivery of nutrition education services.

2. Identify the nutrition education services being provided at DACH.

3. Identify the current methods utilized in providing nutrition education services at DACH.

4. Analyze workload to determine what services are being utilized, the size of classes, and utilization of professional resources.

5. Determine primary and secondary preventive nutrition services, demand versus need services, and the priority of nutrition education activities by importance and allocation of professional resources.

6. Analyze various methods for the provision of nutrition education services.

7. Conduct an analysis of the various methods of delivery of nutrition education services at DACH.

8. Make recommendations to implement the best method of delivering nutrition education services at DACH.

Criteria

1. Recommended methods for the delivery of nutrition education services must be viable according to current professional literature.

2. Recommendations will comply with governing regulations, directives, and guidance.

3. Criteria used in the analysis of methods will be:

a. Use of resources: Staffing and dollar resources required over and above current allocation are not acceptable because of fiscal constraints. Expertise required beyond that available in the Nutrition Clinic must be readily accessible. Additional space requirements must be considered for feasibility.

b. Effectiveness: the preponderance of professional literature must support the effectiveness of the method.

c. Efficiency: the method should be an efficient method of nutrition education dissemination in order to maximize use of professional resources.

4. Criteria used in the analysis of primary preventive services will be:

a. Efficiency: the ability of the method to reach a large number of people.

b. Cost: cost should be minimal since many primary preventive services are not included in workload figures and therefore do not earn supply dollars for the Nutrition Care Division.

c. Adaptable to message length: the method should have the flexibility to accommodate various message lengths.

5. Criteria used in the analysis of secondary preventive services will be:

a. Group interaction: the method should allow for group interaction as this has been shown to increase the effectiveness of the learning experience in adults.

b. Follow-up: the longer the contact between clinician and client, the greater the change in dietary behavior.

c. Effectiveness: the preponderance of professional literature must support the effectiveness of the method.

d. Efficiency: the method should be an efficient method of nutrition education dissemination to maximize professional resources.

Assumptions

1. The present population served will remain constant.
2. The demand for nutrition education services will not decrease.
3. Additional resources will not be made available.

Limitations

1. Workload data will cover only calendar year 1987.
2. Recommended methods for the delivery of nutrition education services cannot require more resources than those currently allocated.

Literature Review

It is not until recently that research has been conducted to determine the effectiveness and feasibility of various approaches to affect dietary habits (Sims 1987). Sims defines nutrition education to be "a form of planned change that involves a

deliberate effort to improve nutritional well-being by providing information or other types of educational/behavioral interventions". The emphasis placed on behavioral change in the process of improving dietary habits is pointed out by Guthrie (1978) who suggests that "If nutrition education is to be effective, it must focus on communicating clearly defined pieces of information with a goal of influencing behavior". The recent concern with effectiveness of nutrition education is placed into context by Gillespie (1987) who points out that "even if we reach only a limited audience. if we can communicate effectively and help this audience move toward positive change, this impact on some people is much better than nonimpact on many people".

Recent research has indicated that the traditional instructor-oriented, one-way communication directed nutrition education programs are not sufficient to produce changes in nutrition behavior. Long term success and maintenance has been shown to be poor (Guthrie 1978, Sims 1981, Johnson and Johnson 1985). The problem defined by Guthrie (1978) is that there are few immediate benefits to be experienced by altering nutritional behavior. The process required to successfully motivate patients to give up the immediate benefits of favorite, but nutritionally poor foods for future benefits of, for instance, weight loss or decreased risk of heart disease is complex. Attitudes and other influences such as personal situations necessitating a change, personal habits, and reference group norms and influences play a

role in mediating a change in nutrition behavior (Sims 1981, Boren et al. 1983, Johnson and Johnson 1985, Ross 1987, Gillespie 1987). Johnson and Johnson (1987) feel that selection of instruction methods in nutrition education is much more important and difficult than it is in other subjects because of the various factors involved in influencing positive nutrition behaviors.

Research conducted over the past twenty years in learning theory has shown that behavior change occurs as a result of changes in knowledge, attitudes, and behavior. How these factors interact has been the subject of much research and programs based on one or more of them have been designed and studied. Nutrition education has traditionally been delivered using a cognitive, or knowledge based approach in which the acquisition of knowledge itself was thought to result in behavior change. Programs structured using a cognitive approach are typically instructor centered. The instructor delivers the information based on the perception of what the learner needs to know (Brush et al. 1986).

An affective based education approach is built on the concept that behavior change is dependent upon attitude change. It is possible that an attitude change must occur before knowledge acquisition as well. Affective based nutrition education, therefore, explores an individual's feelings about food and attempts to develop confidence in controlling food choices and habits (Rosander and Sims 1981).

Behavioral treatments are based on an analysis of behavior,

it's antecedents, and it's consequences. The application of reinforcement theory principles described by B. F. Skinner to dietary modification was first conducted and reported by Ferster et al. (1962). These researchers reported that development of self-control of eating habits includes four elements: identification of variables influencing eating, manipulation of those variables, identification of the undesirable consequences of improper eating habits, and developing self-control. Many behavior modification programs have been developed based on these principles.

Personnel and monetary resources were specifically addressed in some studies. Dietitians were used as instructors in many behavior modification programs with no specialty training. However, some findings of Wilson and Brownell (1980) revealed that the experience and professional training of therapists was positively correlated to client success. Yates states that the cost of a behavioral treatment program is dependent on the effectiveness of the program in producing the stated results, program costs, and the effectiveness of the program delivery system (in Wilson and Brownell 1980). Wilson and Brownell suggest that it is difficult to assess the first two costs. The third, effectiveness of the delivery program, can be assessed by calculating the salary of the health care professional(s) administering the program. They argue that although behavioral programs have been assessed to be moderately effective and low

cost, it may be time to restructure these programs into "effective and durable treatment methods". These will likely be more costly because they involve extended follow-up programs and higher salaried professionals to administer the programs.

Cognitive based programs have been shown to be ineffective in producing long term dietary behavior changes (Johnson and Johnson 1985). Studies conducted by Rosander and Sims (1981) and Brush et al. (1986) measuring the effectiveness of affective based nutrition programs found that, not only did nutrition attitudes and knowledge improve, but dietary behavior as well. Behavioral programs have been shown to be most effective in achieving and maintaining weight loss in mild to moderately obese individuals (20-100% overweight) (Stunkard 1984, Wilson and Brownell 1980). They have also been used to decrease serum cholesterol and triglycerides in individuals (Foreyt et al. 1981, Lovibond et al. 1986) and to improve clinical indicators in diabetics (Rabkin et al. 1983). Many studies have been conducted to determine the effectiveness of behavioral programs. A review conducted by Foreyt et al. (1981) of 16 behavioral treatment studies revealed much consistency of results among the studies. Weight loss occurred during the treatment phase and was greater when instruction intensity and contact was greater. Several of the studies Foreyt et al. reviewed showed positive results with continued contact and that weight loss ceased when contact ended. Overall, Wilson and Brownell (1980) feel that behavior

modification programs offer promise but need revision in order to more effectively maintain and promote further weight loss once the initial program has ended. Stunkard (1984) found that behavior modification programs were effective in maintaining weight loss, but that the weight loss they promoted was only moderate. The effectiveness of behavioral programs has been shown to be enhanced by the addition of an element of social support (Wilson and Brownell 1980). There is limited evidence that cognitive restructuring has been shown to improve the effectiveness by teaching people to anticipate and manage setbacks (Wilson and Brownell 1980). Foreyt et al. (1981) conclude that weight loss which occurred could not be attributed to specific behavioral techniques. On follow up studies included in their review many of the techniques learned during the programs were no longer being practiced.

Behavioral programs have been shown to consistently produce greater weight loss than cognitive methods (Wilson and Brownell 1980). Although patients may not have been successful at attaining goal weight they did lose an average of one to two pounds per week which is consistent with objectives of most weight loss programs. Some studies show that weight loss is maintained (Wilson and Brownell 1980). A study conducted by Jones et al. (1986) found that group behavioral treatments produced greater weight loss than individual behavioral treatment. Attrition rates are significantly lower in behavioral programs in contrast to

other forms of treatment (Wilson and Brownell 1980). One study conducted by Gardner (1982) in which a behavioral approach was compared to a medical (one client to clinician) and social (group) approach revealed that participants in the behavioral group were much more positive and receptive to the message. A non-profit, self-help group, Take Off Pounds Sensibly (TOPS) conducts weekly meetings in which social support and weigh-ins are the major activities. A study was conducted that introduced behavior modification principles into ongoing TOPS programs with a resulting drop in the attrition rate and an increase in weight loss (Stunkard 1984).

The disadvantage of the cognitive based approach to nutrition education is that it has not been found to be effective in promoting long term behavior changes. It is also instructor oriented. In other words, the instructor decides what is important for the participants to know. Knowles (1980), in his discussion on implications for the practice of adult education stresses that adults will be motivated to learn those things they feel are important to know. He further argues that adults will be more committed to an activity they have helped plan and that they actively participate in. Disadvantages of affective based programs were not available from the literature review. Behavioral programs produce inconsistent and clinically small results among patients. Some studies have not shown continued weight loss following the program (Wilson and Brownell 1980, Foreyt et al.

1981), and some show that weight loss is not well maintained (Wilson and Brownell 1980). A probable reason for this variability among studies is that behavioral programs are not standardized. One study conducted by Loro et al. (1979) compared three different behavioral programs for effectiveness. They found that a self-initiated treatment was most effective in producing a weight loss that was maintained throughout follow-up. Programs which emphasized controlling external eating cues and controlling eating behavior were found to produce a smaller weight loss which was not maintained during follow-up. These two behavioral techniques are those that form the basis of many behavioral programs.

Because of the questionable effectiveness of the most commonly utilized methods of disseminating nutrition education, the National Dairy Council Conference on Strategies for Theory Building in 1981 concluded that there was a need for more theory building in the area of the process of nutrition education (Sims 1987). Since that time a number of articles discussing and developing nutrition education theory have appeared in the literature. Gillespie and Yarbrough's (1984) conceptual framework for communicating nutrition focuses on receiver inputs such as previous knowledge, beliefs, and attitudes toward the subject and their effect on the education process. This model places responsibility on the educator to determine the appropriate message and mode of transmission based on the characteristics of

the receivers. Although Gillespie (1987) acknowledges the importance of social interaction, she has found that it is not essential for message acceptance. Therefore, Gillespie concludes, mass media can be used effectively especially if combined with aspects of interpersonal communication.

Elements of marketing can be applied to nutrition education to produce a more effective interchange between nutrition educators and consumers (Fleming 1987). One area in which marketing strategies might improve non-profit nutrition services is segmenting. Segmenting the market rests on the principal that the educator cannot attend to the diverse needs of a diverse group of people. In addition it would be difficult for participants to identify with the group as an important reference group and adopt its norms because of its diversity.

Johnson and Johnson (1985) developed a Process of Nutrition Education model. This model is based on the idea that to achieve the goals of nutrition education, such as knowledge, positive attitudes, seeking of further information, and enduring behavior, it is necessary to use instructional strategies that take into account factors related to social context and interpersonal interaction. These factors have been shown to influence the acquisition of knowledge, development of positive attitudes, and behavior change. The instructional strategies recommended are participative in nature.

All of these models incorporate an element of interaction

between clients and clinicians. The methods of instruction that incorporate or are based on these models will be referred to as interactive instructional strategies. These strategies have been found to improve nutrition knowledge and attitudes and effect dietary behavior change to meet both short term and long term goals of nutrition education (Johnson and Johnson 1987). Johnson and Johnson (1985) state that it is through the cognitive processing of interpersonal experiences that long term behavior changes are achieved. The social context and interpersonal interaction factors necessary to achieve behavior change are listed in Table 2.

- | |
|--|
| <ol style="list-style-type: none"> 1. Adopting and conforming to reference group norms. 2. Public commitment to relevant behavior, and being held accountable by peers. 3. Exposure to credible social models. 4. Exposure to vivid nutrition information. 5. Discussion of nutrition information with peers. 6. Teaching nutrition information to peers. 7. Acquiring continuing motivation to learn more about good nutrition. 8. Framing dietary behavior as a personal gain or loss. |
|--|

Table 2: Social Context and Interpersonal Interaction Factors.
Source: Johnson and Johnson (1987)

The work of Knowles (1980) in adult education supports the learning theories of Johnson and Johnson. He identifies

participant self-diagnosis of needs, involvement in the planning process, involvement in the learning experience, and self-evaluation as implications for the practice of education. Adults are decision makers and managers of their own lives. They learn best through activities such as group discussion, simulation exercises, demonstration, seminars, and group therapy where they can share their own experiences and benefit from those of others.

Fleming and Brown (1981) stress the importance of incorporating target audience concerns into nutrition education programs. Without this input, nutrition educators may create a product for which there is no market. These researchers also found that segmentation of groups was effective when based on nutrition goals and objectives of the program participants.

A study conducted by Raeburn and Atkinson (1986) demonstrated that social support was effective in promoting weight loss. When coupled with a behavioral program weight loss was enhanced and attrition dropped. Weight loss maintenance was shown to be better with social support. A review conducted by Wilson and Brownell (1980) of studies that measured the effect of spouse or significant other support have also shown positive results. Whitehead (1973) conducted an extensive review of reports on nutrition education activities conducted between 1900 and 1970. Based on the studies she concluded that successful nutrition education programs should include interactive strategies. Those she listed are self-diagnosis of problems and development of

solutions, development of concepts of nutrition, active involvement of participants in decision making and problem solving before providing them with specific dietary advice, use of small discussion groups, and use of coordinated community approaches.

In addition to those already identified, an advantage of using interactive instruction strategies is that they are group oriented and therefore an efficient use of personnel resources. A study conducted by Jones et al. (1986) examining the effectiveness of social support found that group treatment produced greater weight loss than individual treatment.

To this point, all methods of nutrition education reviewed have been interpersonal: one clinician to one client or a limited group of clients. Another general method of nutrition education dissemination is mass media. Mass media has the distinct capability of being an economical means to reach a large audience. If used effectively, various forms of media can promote preventive behavior. Glessing and White (in Snegroff 1983) define a mass medium as "any means, agency, or instrument which communicates ideas, attitudes, impressions, or images to large numbers of people". Media communication is not only confined to sources such as television, radio, and newspapers but also to non-traditional media forms such as posters, mailers, billboards, and comic books (Snegroff 1983). Mass media is an important source of health information for Americans. In 1978, the American Hospital Association found that most people obtained health information in

that manner (AHA in Snegroff 1983).

A survey conducted by Lambert-Lagace (1983) indicated that the effectiveness of nutrition information disseminated via mass media was dependent upon the type of mass media used by the population, their attitudes toward the information, and their attitudes toward nutrition information previously presented through the media. Other studies have shown that it is essential to target the message to the intended audience in order to achieve effective communication of the message (Cerqueira et al. 1979, Fleming and Brown 1981, Gillespie et al. 1983, Weiss and Davis 1985, Nitzke 1987). Gillespie and Yarbrough (1984) stress the importance of consumer inputs in developing effective nutrition communication. Comprehensive nutrition programs utilizing mass media can be developed after population segments have been identified and their food selection and nutrition information sources have been assessed (Fleming and Brown 1981). Selection of the most appropriate medium to deliver a particular message is dependent on a number of factors identified by Singer and Cecere (1988). These factors include timeliness, viewing time, discount availability, shelf life, involvement required of the receiver, message complexity, selectivity and ethnic appeal. The effectiveness of mass media is as controversial as other methods of nutrition education. Johnson and Johnson (1985) state, from their review of the literature, that new behaviors are rarely adopted as a result of mass media exposure. But Cerqueira et al. (1979)

compared the effectiveness of direct methods of nutrition education with mass media using posters, pamphlets, and radio and found that both methods were equally effective in increasing nutrition knowledge and changing dietary behavior in a population of rural Mexican mothers. Snegroff (1983) points out that mass media can be especially useful in primary prevention of chronic illness by calling attention to risk factors.

Newspapers are one form of media that have been used in disseminating nutrition information. Weiss and Davis (1985) found that nutrition information printed for an elderly audience in a newspaper for seniors was effective in changing reported eating behaviors. They emphasize that it is particularly important to determine the needs and backgrounds of the intended audience and then target the messages accordingly. The advantages to utilizing the newspaper as a medium to provide nutrition education are that it can be effective in changing behavior when the message is targeted to a particular audience, and the newspaper provides information at a rate and a time that is convenient to the reader (Weiss & Davis 1985). The study conducted by Weiss and Davis found that printed material was their study population's second and third choice of a source of nutrition information. Additionally, newspaper clippings can be saved for future reference, and the newspaper format adds credibility. Length of articles can easily be adapted and the written format is suitable for complex messages.

A study conducted by Gillespie et al. (1983) using direct mail with a built-in three-way interactive communication system was found to be effective in increasing nutrition knowledge and improving nutrition behavior of middle income parents with at least one preschool age child. Gillespie et al. note that direct mail is efficient for reaching large numbers of people quickly. Constraints noted in the dissemination of nutrition education through the written media involve the requirement of time to develop and design professional looking flyers. Another constraint is that not all of the members of the target audience will receive or read the message (1983).

In the study conducted by Cerqueira et al. (1979) testing the effectiveness of mass media techniques in changing nutrition knowledge and behavior of rural Mexican mothers, the media techniques used in this study consisted of radio spots, pamphlets, and posters. Although the control group did not receive formal instruction, nor have access to the pamphlets and posters, they did have access to the radio spots. Mothers in the mass media group increased their nutrition knowledge by 54%. The control group increased their knowledge scores by 19%. This improvement in the control group was believed to be attributed to the radio spots. The media group demonstrated highly significant positive dietary behavior changes. The control group did not; in fact, they demonstrated significant negative dietary behavior changes. The positive change in behavior of the media group was

thought to have occurred through reinforcement of information through the use of several different types of media.

An advantage of the use of radio for dissemination of nutrition information is its audience. Radio reaches over 95% of the American population over age 12 daily (Snegroff 1983). Additionally, public service announcements can be aired at no cost to the dietitian (Snegroff 1983).

Videotapes have been used in group instruction, singularly or in combination with another format such as lecture. They have also been used individually for self-instruction. A study conducted by Buckley et al. (1982) in which individual instruction was compared to videotape instruction for teaching adolescents to take their own blood pressure revealed that the videotape method required less professional time expenditure. Lawson et al. (1976) reported similar findings in a study conducted to determine the feasibility of using video-cassettes to teach renal dialysis patients about their diets.

Buckley et al. (1982) compared the cost of individual instruction against videotape instruction. Included in the calculation was cost of equipment and professional time expended. They found that the videotape instruction was cost effective for an annual patient load of 23.9 patients if equipment was available and 93.6 patients if equipment had to be purchased. They concluded that for large patient loads, the videotape method of instruction would be cost effective.

A study conducted by Pace et al. (1981) on the effectiveness of using a video-cassette program as a mass media technique in conjunction with counseling revealed that patients were enthusiastic about the program. Since initial diet counseling sessions often offer more information than can readily be absorbed at one time, the cassettes enhance learning through the repetition of auditory and visual messages. Buckley et al. (1962) compared the effectiveness of individual lecture instruction with videotape instruction and found both equally effective in teaching adolescents how to take their own blood pressure. Lawson et al. (1976) found video-cassette instruction to be effective in improving renal dialysis patient's knowledge of their diet and in promoting behavior change. Positive patient dietary changes were achieved.

An advantage of videotapes is that they can be presented to groups to replace or enhance an oral presentation or they can be used by an individual to review material or learn new information. When used individually, the program can be repeated as desired by the patient thereby improving the chance for comprehension (Lawson et al. 1976, Pace et al. 1981).

Interactive videodisc learning systems are a fairly recent technology combining features of the videotape and the computer to produce high quality graphic presentation of subject matter to students or patients.

Staff resources required are minimal since students (patients)

can operate the program by themselves. However, each patient must still be seen on an individual basis to be evaluated for nutritional status and to be provided an individualized meal plan. Someone must also be available to provide technical assistance with the equipment and to answer questions that may arise (Hekelman et al. 1986). Expertise would be required to develop videodisc programs unless there would be commercial discs available.

The cost of the system would depend on the number of units required and the number of programs to be run. Zeigler (1986) calculates the cost of one unit to be \$7500. This total cost includes the computer with interactive board set at \$4000, the monitor with touch screen at \$2300, and the disc player at \$1200. The cost of the laser disc must be added to this. Unless there are videodisc available, the cost of equipment and expertise to develop them must be considered. Minimal cost for a video camera, tape decks, and editing equipment to produce the videotape plus the cost to cut the videodisc master is approximately \$17,000. Costs can run to \$150,000 to produce high quality videodiscs.

Many studies have found that instruction with interactive videodisc is effective. Studies reviewed by Edmunds et al. (1987) showed more efficient learning and better knowledge retention with the use of interactive videodisc. Although a study conducted by Edmunds et al. (1987) failed to show a significant increase in the level of nutrition knowledge, based on pre- and post-tests.

participants reported that they felt their knowledge had increased. They felt very positive about the videodisc system and the ease of operation. A survey of first year medical students who used interactive videodisc tutorials indicated that they found the tutorials helpful and an efficient instruction alternative (Jensh 1987). Studies were conducted by the Medical Information Technology Research Group of the Henry M. Jackson Foundation for the Advancement of Military Medicine to determine the educational effectiveness and cost efficiency of videodisc technology used in teaching Army medics how to prepare and administer intramuscular injections (Balson et al. 1985-6). The studies showed that the use of videodisc technology resulted in faster training time, higher test scores, lower student stress, and greater student satisfaction with the training method.

Because videodisc technology is a relatively new phenomenon, it has been complex to produce and has lacked standardization (Casey 1987). A variety of commercial discs simply are not yet available. The technology is also very sophisticated. Balson et al. (1985-6) reported that there was no significant difference in efficiency or effectiveness between two groups of students; one in which the videodisc was used in much the same manner as would be a videotape, and the other in which all the capabilities of the videodisc were utilized. They concluded that for their training situation, the additional time and expense required to produce videodisc programs were not justified.

In addition to those previously addressed, Hekelman (1986) lists these advantages: the system is capable of providing feedback to the student, the student can control the speed of the program, the laser discs are capable of providing quality graphic presentations, there is consistency of instruction, and there is increased accessibility to the programs. Additionally, program material cannot be easily altered and the system is capable of collecting information (Casey 1987).

Research Methodology

The first step in determining how to best deliver nutrition education services at Darnall Army Community Hospital was to review all applicable Department of the Army (DA), Health Services Command (HSC), American Dietetic Association (ADA), Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and DACH regulations, standards, and directives pertinent to the delivery of nutrition education to determine mandated services. Public health nutrition initiatives were also reviewed because they arouse public awareness, stimulate demand for additional information, and are based on current national health concerns and initiatives. As a result, these initiatives are important considerations when determining what nutrition education services to offer.

Nutrition education services currently being provided through the Nutrition Clinic, Darnall Army Community Hospital were then

identified and described as to program content, programmed follow-up sessions, transmission medium, and frequency of classes. An assessment was then made as to whether the services currently offered by the Nutrition Clinic meet mandated services and public health initiatives. The purpose of this step was to determine whether additional services would need to be addressed, or, if some services presently provided exceeded requirements. Services were categorized as primary or secondary preventive activities because they require different criteria for determining which education methods are most appropriate.

Workload was analyzed to determine the number of patients utilizing various nutrition education services. The average size of classes was determined and the average number of follow-up classes attended was calculated. Numbers of active duty personnel attending Calorie Restricted Classes were identified to determine whether attendance at follow-up sessions was better than for the other than active duty group since the class and its follow-up sessions are mandatory for soldiers enrolled in the Army Weight Control Program. An estimate of the actual time spent by the dietitians in presentation of the various nutrition education services was calculated using a modified formula for conversion of visits into equivalents. The explanation of the conversion is provided in Appendix B. This calculation demonstrated how much time the dietitians were spending in each activity. The Chief of the Clinical Dietetics Branch was asked to

prioritize nutrition education activities in order of importance and then in order of professional time that should be allocated to each. Services were then assessed as to whether they were being provided on a demand or a need basis. This information would be used in the final conclusion and recommendations.

An analysis of the interpersonal, mass media, and individual nutrition education methods was conducted for feasibility of implementation of methods in the Darnall Army Community Hospital Nutrition Clinic. The criteria identified on page 4 were used in the analysis. The methods were first scored for feasibility of implementation and then for appropriateness for primary and secondary preventive activities. Final recommendations were based upon this analysis and the prioritization supplied by the Chief of the Clinical Dietetics Branch.

II. DISCUSSION

Identification of Nutrition Education Service Requirements

Mission requirements for the delivery of nutrition education were obtained from Department of the Army and Health Services Command regulations. Department of the Army technical manuals and Joint Commission for Accreditation of Healthcare Organizations standards were reviewed but found not to contain applicable mission requirements. Current public health nutrition initiatives were obtained from the Department of Health and Human Service's nutrition objectives for the nation and from the National Research Council guidelines for lowering cancer risks.

Army Regulation 40-2, Army Medical Treatment Facility General Administration (1981) governing the administration of hospital food service establishes the basic mission of the Nutrition Care Division. Concerning nutrition education services, this regulation requires the provision of dietary counseling to patients and nutrition education for the military community.

Two specific Army health initiatives require nutrition education support by Army dietitians. These initiatives are the Army Weight Control Program and the Army Health Promotion Program. The requirement for nutrition education services in support of the Army weight control program is established in Army Regulation 600-9, The Army Weight Control Program (1986). All medical treatment facilities must establish weight reduction and counseling programs in support of the Army weight control program. Mandatory

attendance in nutrition education sessions conducted by qualified healthcare personnel is required of all soldiers enrolled in the program. Health professionals will assist soldiers, supervisors, and commanders in selecting a proper diet by providing appropriate literature and training aids for their use.

The goal of the Army Health Promotion Program (AR 600-63 1987) is to maximize combat readiness and work performance. This program is comprised of various components designed to promote healthy lifestyles, two of which are weight control and nutrition. Commanders are required to see that nutrition education and counseling programs are provided to soldiers and their families, Department of the Army civilians, and dining facility managers. These services are to be provided by, or coordinated with, qualified health care professionals. This regulation also requires that procedures for the referral of individuals with significant health risk factors such as high blood pressure, elevated levels of cholesterol, obesity, and poor nutrition that are identified during periodic physical exams and automated health risk appraisals, be developed and implemented within the health care facility.

Health Services Command (HSC) regulations reiterate the nutrition education responsibilities identified in the Army regulations. HSC Regulation 10-1, Organization and Functions Policy (1987) delineates the functions of all activities within HSC medical treatment facilities. This regulation identifies the responsibility of the Nutrition Care Division to provide nutrition

education and awareness in support of the weight control and health promotion programs. HSC Regulation 40-27, HSC Support of the Army Health Promotion Program indicates that dietitians will assist the installation Health Promotion Council with nutrition education classes.

A major goal of public health policy is to promote health programs that are designed to reduce risk factors contributing to chronic disease. These programs include dietary modification and improved nutrition (Kaufman et al. 1987). In 1980, the Department of Health and Human Services (DHHS) published health objectives for the nation (DHHS 1980). Nutrition objectives were established based on identified national nutritional deficiencies. Those objectives involving nutrition education are: prevention of iron deficiency anemia of pregnancy, prevention of child growth abnormalities, identification and treatment of obesity, identification of and dietary modification to reduce elevated serum cholesterol, identification of and dietary modification to reduce sodium ingestion greater than six grams daily, encouragement of breastfeeding, promotion of United States Department of Agriculture (USDA)/DHHS Dietary Guidelines by employee and school cafeteria managers, and inclusion of nutrition education and dietary counseling in routine health professional contacts. A review of public health policy on diet, nutrition, and cancer conducted by Palmer (1985) concluded that, although there are, as yet, no conclusive links between diet and cancer, there is persuasive

evidence that some dietary practices appear to be associated with increased cancer risk, and that other dietary behaviors appear to be preventive. The National Research Council (NRC) published dietary guidelines for lowering cancer risk in 1982. These guidelines are: reduce saturated fat and total fat intake; include citrus fruits, vegetables containing Vitamin A and those from the cabbage family, and whole-grain products; minimize consumption of cured, pickled, and smoked foods; and avoid excessive alcohol consumption (Palmer).

Nutrition Education Services Provided at DACH

Currently the Nutrition Clinic provides individual and group counseling programs for calorie restriction, cholesterol and triglyceride reduction, and diabetes. Prenatal and well baby nutrition classes are given on a regular basis. A description of these programs is located in Table 3. Individual counseling is provided for patients requiring other dietary modifications or individualized attention. Basic nutrition lectures are presented on a regular basis to the Commander's Total Fitness Course, a course designed for new company commanders. Lectures on basic nutrition and weight control are provided to military units, schools, and community groups as requested. Dietitians regularly provide a nutrition component to the Take Off Pounds Sensibly group, a not-for-profit, commercial weight reduction program. The Nutrition Clinic also provides nutrition education to the military community

Program	Description	Format	No. Classes
Cal Restr Class	Assists clients in losing weight. Initial class provides explanation of calorie balance, exchange plan for dieting, and techniques for changing behavior. Sodium restricted information provided if needed. Follow-up session topics: exercise stress management behavior modification diet management psycho-social aspects pharmaceuticals	One initial class (2 hr); individual interview.	3 classes/ week.
		Six follow-up sessions (1 hr each).	2 classes/ week.
		Initial and follow-up sessions taught in group format.	
Chol/Trig Red'n Class	Assists clients in making dietary changes to reduce intake of fats, cholesterol, and sugar. Sodium restricted information provided if needed.	One initial class (2 hr); individual interview.	3 classes/ month
		One follow-up (1 hr).	1 class/mo
		All sessions taught in group format.	
Diabetic Class	Initial or reinstruction covers diet and exchange lists, food components, physiology, and exercise. Sodium restricted information provided if needed. Follow-up session topics: stress management home glucose monitoring exercise & foot care pharmaceuticals diet management psycho-social aspects	One initial class (2 hr); individual interview.	1 class/ week.
		Six follow-up (1 hr ea).	1 class/ week.
		All sessions taught in group format.	
Prenatal Nutr Class	Provides basic nutrition principles and expected weight gain during pregnancy to women in first trimester of pregnancy.	One initial group class (1/2 hr).	2 classes/ month.
		F-U requested by client.	

Program	Description	Format	No. Classes
Well Baby Nutr Class	Provides information on infant nutrition and feeding for parents of two week, two month, and four month old infants.	One initial group class for each category (15 min). Follow-up as desired by client.	3 classes/ea age category/wk.

Table 3: Nutrition Education Services Provided at DACH

by publishing articles in the Fort Hood Sentinel, a weekly newspaper, offering programs through a military community center on holiday cooking and other topics, providing commissary shopping tours, and participating in health fairs. Dining facility managers and cooks are provided instruction in reduced fat and calorie food preparation in support of Army health and fitness initiatives.

Nutrition education services currently being provided were compared against the identified requirements and are displayed in Table 4. Every identified requirement was being addressed by existing nutrition education programs and services.

The nutrition education services currently being provided were assessed for the types of delivery methods utilized. The results are displayed in Table 5. It can be seen from this analysis that most education services are transmitted through lecture. Lectures are supplemented with pamphlets or other written material, and videotape programs. Very few activities include elements of social interaction.

Nutrition education services were categorized as primary or secondary preventive activities. The goal of primary prevention is to prevent the occurrence of disease risk factors. The goal of secondary prevention is to identify symptoms at an early stage and treat them thereby preventing serious illness (Vanderschmidt et al. 1987). Nutrition education services offered at DACH are classified in Table 6.

Requirement	Source	Nutrition Clinic Service
1. Dietary counseling to patients.	AR40-2	a. All classes. b. Individual counseling sessions.
2. Nutrition education for military community	AR40-2	a. Lectures to units and community groups. b. Basic Nutrition Class to Cdr's Total Fitness Course. c. Newspaper articles. d. National Nutrition Month. e. Commissary Shopping Tours. f. Health Fairs.
3. Support of Army Wt. Control Program.	AR600-9	a. Calorie Restricted Class. b. Lectures to units. c. Low Fat/Calorie Food Preparation Class to dining facility personnel.
4. Support of Army Health Promotion Program.	AR600-63	a. Calorie Restricted Class. b. Basic Nutrition to Cdr's Total Fitness Course. c. Lectures to units. d. Low Fat/Calorie Food Preparation Class to dining facility personnel. e. Newspaper articles. f. Dietary counseling.
5. Prevention of iron deficiency anemia of pregnancy.	DHHS	a. Prenatal Nutrition Class. b. Individual counseling.
6. Prevention of child growth abnormalities.	DHHS	a. Well Baby Nutrition Class. b. Individual counseling.
7. Dietary treatment of obesity.	DHHS	a. Calorie Restricted Class. b. Individual counseling.
8. Diet modification to reduce serum cholesterol.	DHHS	a. Cholesterol and Triglyceride Reduction Class. b. Individual counseling.
9. Dietary sodium reduction.	DHHS	a. Individual counseling. b. In conjunction with Calorie Restricted, Cholesterol and Triglyceride, and Diabetic Classes.
10. Promotion of USDA/DHHS guidelines by cafeteria managers.	DHHS	Low Fat/Calorie Food Preparation Class to dining facility personnel.

Requirement	Source	Nutrition Clinic Service
11. Inclusion of nutrition education/ diet counseling in routing health professional contacts.	DHHS	This initiative is pursued in an administrative mode and will not be included in the discussion.
12. Diet modification for lowering cancer risk.	NRC	a. Basic Nutrition Class to Cdr's Total Fitness Course, units, and community groups. b. Included as general recommendations in Calorie Restricted, Cholesterol & Triglyceride Reduction, and Diabetic Classes. c. Newspaper articles.

Table 4: Nutrition Education Service Requirements and Activities Provided to Support Them.

Educational Activity	INSTRUCTIONAL MODE					
	Lecture Int'pers or Media	Indiv One on One	Inter-active Strategy	Written Material	Audio-Visual	Video-Tape
Cal Restr Cl Initial	X	X		X		X
F-up	X			X		
Chol/Tri Red'n Initial	X	X		X		
F-up	X			X		
Diabetic Cl Initial	X	X		X		
F-up	X		X	X		
Pre-Natal Initial Questionnaire	X	X		X X		
F-up		X		X		
Well Baby	X			X		
Individual		X		X		
Community	X			X		

Table 5: Modes of Education Currently Utilized

<u>Primary Nutrition Education Services</u>	
	Well-Baby
	Prenatal
	Community Lectures
	Basic Nutrition
	Low Fat and Calorie Food Preparation
	Newspaper Articles
<u>Secondary Nutrition Education Services</u>	
	Calorie Restricted Class
	Cholesterol and Triglyceride Reduction Class
	Diabetic Class
	Other Individual Counselings

Table 6: Primary and Secondary Nutrition Education Services

Workload Analysis

Daily Nutrition Clinic sign-in sheets for calendar year 1987 were used to analyze workload. Results are depicted in Table 7. Each nutrition education activity was subdivided as appropriate into individual or group initial and/or follow-up sessions. For each of these categories the numbers of patients seen were calculated. Next, the number of classes conducted during the year was determined so that the average number of patients per class could be calculated. It was found that class sizes ranged from four for initial diabetic classes to 25 for follow-up calorie restricted classes.

The number of follow-up classes attended per initial attendee was calculated for activities with programmed follow-up sessions.

Educational Activity	# Ptn CY 87	# of Classes	# Ptn/ Class	# F-U/ initial	A.D.	# AD F-U/ AD initial	Total
Cal Restr Cl							7613
Initial Indiv	38	-	-				
Initial Class	1807	146	12		1399		1845
F-up Indiv	503	-	-				
F-up Class	3383	97	35	2.7*	2679	1.9	3886
Weight Check	1882	-	-		1558		1882
Well Baby	6195	429	14	-			6195
Pre-Natal							5375
Initial Indiv	1185	-	-				
Grp Quest'n	3365	94	36				
Initial Class	480(est)	2	20				5030
F-up Indiv	345	-	-	-			345
Diabetic Cl							792
Initial Indiv	10	-	-				
Initial Class	185	47	4				195
F-up Indiv	165	-	-				
F-up Class	432	47	9	3.0			597
Basic Nutritn	513	26	20	-			513
Other							371
Class	Unk	24	Unk				Unk
Initial	236	-	-				236
F-up	135	-	-	-			135
Chol/Tri Red'n							320
Initial Indiv	9	-	-				
Initial Class	250	42	6				259
F-up Indiv	9	-	-				
F-up Class	52	9	6	.24			61
DFAC-Lo Cal	Unk	5	Unk	-			Unk
Ptn visits '87							21,179
Indiv							4,517
Class							16,662

* Other than active duty.

Table 7: Workload Calendar Year 1987

It was found that the average non-active duty weight control client attended nearly three out of six follow-up sessions while the active duty attended less than two. The explanation for this could be duty constraints such as lack of support by the unit or training requirements. It is also possible that once the soldier meets his or her maximum allowable weight, he or she is no longer obligated to attend the classes. Another explanation could be that the soldier is not internally motivated to lose weight and, therefore, makes no great effort to attend classes. The follow-up session for the Cholesterol and Triglyceride Reduction Class was poorly attended with less than 25% of clients attending. Patients seen for instruction in dietary management of diabetes attended an average of three of the six follow-up sessions. This statistic may actually be higher because many patients receive individual instruction from the medical and nursing staff making attendance at some of the follow-up sessions unnecessary.

Over 78% of all patients are seen in groups; the rest individually. Included in the statistics is a Prenatal Nutrition Class given twice monthly. Patients are not entered in on the Nutrition Clinic sign-in sheet so the number of patients seen is an estimate by the Chief of the Clinical Dietetics Branch.

When total amount of time spent in presentation of nutrition education services by dietitians was calculated, it was found that prenatal and calorie restricted activities consumed the most time (see Table 8). An explanation of the time factors used in

Educational Activity	GROUP			INDIVIDUAL			Total
	Factor	Classes	Hours	Factor	# Ptns	Hours	
<u>Pre-Natal</u>							
Initial	.5	24	12	1	1185	1185	1197
Questionnaire	1.5	94	141				141
F-up				.2	345	69	69
Total							1407
<u>Cal Restr Cl</u>							
Initial	4	146	584	1	38	38	622
F-up	.17	97	16	.2	503	101	117
Weight Check				.2	1882	376	376
Total							1115
<u>Other</u>							
Initial	2	24	48	1	236	236	284
F-up				.2	135	27	27
Total							311
<u>Diabetic Cl</u>							
Initial	2	47	94	1	10	10	104
F-up	.17	47	8	.2	165	33	41
Total							145
<u>Well Baby</u>	.25	429	107				107
<u>Chol/Tri Red'n</u>							
Initial	2	42	84	1	9	9	93
F-up	1	9	9	.2	9	2	11
Total							104
<u>Basic Nutritn</u>	2	26	52				52
<u>DFAC-Lo Cal</u>	2	5	10				10
Total hours '87							3251

Table 8: Dietitians Time Spent in Presentation of Nutrition Education Services

conversion of visits to hours can be found at Appendix B. Converting these hours into manyears can be accomplished by dividing the total number of hours by productive time per person per year which is 1744 hours per person. This figure was obtained from the Resource Management Division Force Development Branch. The result is 1.86 manyears. Caution must be used in the interpretation of this number. Not included in the calculation are many activities of the dietitians such as attendance at meetings, presentation of inservice classes, time spent in preparation of articles for the newspaper, presentation of commissary classes, participation in National Nutrition Month activities, professional development, and administrative duties.

The Chief of the Clinical Dietetics Branch was asked to prioritize nutrition education services, first, according to their importance and second, according to the amount of professional time that should be allocated to each. The results are shown in Tables 9 and 10.

Calorie Restricted Class
Diabetic Class
Cholesterol & Triglyceride Reduction
Prenatal Class
Well-Baby Class
Community Nutrition Activities

Table 9: Nutrition Education Activities Prioritized as to Importance.

Calorie Restricted Class Cholesterol & Triglyceride Reduction Prenatal Class Community Nutrition Activities Diabetic Class Well-Baby Class

Table 10: Nutrition Education Activities Prioritized as to Allocation of Professional Time.

Commenting that all of the nutrition education activities listed were important, the Chief of the Clinical Dietetics Branch used Army initiatives and medical significance as the criteria in prioritizing activities according to importance.

The same criteria were applied when prioritizing activities for allocation of professional time. In addition, those activities that could be taught via media, or where there was a low demand for services were given low priority.

It is apparent from this exercise that the Army weight control and health promotion initiatives are influencing the activities of the Nutrition Clinic. From the analysis of workload and utilization of professional time, the Chief of the Clinical Dietetics Branch can make adjustments in classes offered to meet her own identified initiatives.

The policy of the Central Appointment System is to give priority for appointments to active duty personnel. Family members of active duty personnel are given second priority and retirees, their family members, and survivors are given last priority for obtaining appointments. The Nutrition Clinic clerk/receptionist

schedules all appointments for the Nutrition Clinic. Because there is no backlog for appointments, no one is given priority. However, the population being served is not entirely representative of the demand for nutrition education services because some services are not provided on a demand basis, but rather on a professional perception of need (Jeffers 1971). This need is based on a number of studies which indicate that certain sub-populations are at nutritional risk. The nutrition education services provided based on perceived need are the prenatal class and questionnaire session, well baby nutrition classes, basic nutrition to the Commander's Total Fitness Course, and reduced fat and calorie food preparation classes to troop dining facility cooks. In addition, the active duty component of the calorie restricted class is provided based on an identified need by the Army.

Table 11 depicts numbers of patients seen on a demand versus need basis. It can be seen that more than three times as many clients are seen based on need, but the time invested by dietitians is heavily weighted toward demand services (see Table 12). The difference between services based on demand and need is that demand services are scheduled by request of the person requiring the service because of some internal motivator to learn about a particular diet modification. Services provided based on need are scheduled by the provider to a captive audience. They may or may not be receptive to the nutrition message depending on their receiver inputs as described by Gillespie (1987).

	<u>Demand</u>	<u>Need</u>
Calorie Restricted	1977	5636
Well Baby		6195
Prenatal	1530	3365
Diabetic	792	
Basic Nutrition		467
Other	371	
Chol/Trig Reduction	320	

Table 11: Numbers of demand versus need visits

	<u>Demand</u>	<u>Need</u>
Prenatal	1251	31
Calorie Restricted	803*	312
Other	329	
Diabetic	145	
Well Baby		107
Chol/Trig Reduction	104	
Basic Nutrition		42
* This figure includes some services provided on a need basis which cannot be factored out.		

Table 12: Time resources (in hours) utilized in demand versus need activities.

Development of Alternatives

Based on the literature review, three general categories of nutrition education methods will be analyzed for feasibility of implementation. These are interpersonal, mass media, and individual. The interpersonal methods evaluated will be cognitive, affective, behavioral, and interactive. Media methods discussed are newspapers, mailers, radio, and videotape. Individual methods of nutrition education evaluated will be videotape and

interactive videodisc. Explanation of the evaluation method used is located in Appendix C.

Interpersonal Education Methods

Advantages common to all four interpersonal education methods is that they do not require additional personnel or space to implement. No additional expertise is required to implement these educational strategies, in fact, attributes of the cognitive, affective, and behavioral approaches are present in the current delivery of nutrition education services. However, in order to effectively implement affective, behavioral, or interactive education strategies, additional skills would need to be acquired. This is merely a "start-up cost" rather than an expertise deficiency. Increased costs would also be minimal since the only additional cost might be that of program instruction materials.

The major disadvantage of the cognitive based approach is that it has not been found to be effective in promoting long term behavior change. Sufficient literature was not found to establish the effectiveness of the affective method and it was, therefore, not considered favorably. Although studies are inconsistent in their conclusions on the effectiveness of behavioral programs, it is clear that many have met with success. Extensive literature studies support the effectiveness of an interactive approach.

Efficiency among the cognitive, affective, and behavioral approaches is similar. All can be used in a clinician to client

or group situation. If patients are seen in groups it is generally necessary for the clinician to meet with each client individually to assess nutritional status and individualize a diet plan. With interactive strategies, clients develop their own goals, so there is no need for individual consultation. This strategy can only be utilized in a group situation.

The four interpersonal education methods were rated against the criteria identified in Chapter One and are ranked in Table 13. Based on analysis of the criteria, interactive and behavioral education methods are considered feasible for implementation.

	Personnel	Cost	Effectiveness	Efficiency	Total
Interactive	10	10	10	10	40
Behavioral	10	10	5	5	30
Cognitive	10	10	0	5	25
Affective	10	10	0	5	25

Table 13: Ranking of Interpersonal Education Methods

Mass Media

Of the five media that will be evaluated, mailers and radio have not been utilized by the Clinical Dietetics Branch dietitians. Lectures are provided to military and community groups as previously described. Darnall dietitians regularly publish articles on various nutrition topics in the Fort Hood Sentinel, a free weekly newspaper carrying stories about the activities of Fort Hood units and their soldiers. The paper has a circulation of greater

than 20,000 and is distributed to various supply points on Fort Hood and in Killeen, Harker Heights, Copperas Cove, Nolanville, Temple, and Belton. Samples of these articles are included in Appendix D. Videotapes are used as an adjunct to group diet instruction and are played while patients are waiting for all others to be interviewed.

Adequate personnel and expertise are available to implement any of the mass media techniques except for mailers and radio. In order to minimize costs, mailers could be sent through the military message center to active duty soldiers in their units. The addressing of mailers would be time consuming but would not require professional time of the dietitian. Sending mailers only to active duty soldiers would limit the versatility of this type of nutrition education dissemination. Producing radio spots requires time and expertise not readily available to the dietitians at Darnall Army Community Hospital.

Cost of most media techniques was either insignificant, or as in the case of videotapes or film strips, could easily be absorbed within the supply budget. There would be a cost involved in the printing and distribution of mailers, whether it came out of the Nutrition Care Division or the message center budget. Additionally, not all members of the target audience will receive or read the messages. Since the newspaper reaches essentially the same audience it is a much more cost efficient method of disseminating the information.

The effectiveness of all media techniques was inconclusive based on the variability of results in the studies reviewed. What has been suggested is that these strategies are most useful in arousing public awareness of health risks and of presenting information that can be used for prevention rather than treatment of them. Studies have also demonstrated the increased effectiveness of various techniques when combined.

Of the five types of media, newspapers and radio were felt to be the most efficient because of the targeted population of the newspaper and the potential audience of the radio. Lecture and videotape audiences would be limited to seating and visual capacity. Mailers would not be as efficient because the time required to address them would limit the usefulness of mailers as a medium.

Mass media education methods were rated according to their ability to meet the established criteria. They were then ranked (see Table 14). Newspapers, lectures, and videotapes were rated highest for feasibility of implementation at Darnall.

	Personnel	Cost	Effectiveness	Efficiency	Total
Newspapers	10	10	5	10	35
Lecture	10	10	5	5	30
Videotape	10	10	5	5	30
Radio	0	10	5	10	25
Mailers	5	5	5	5	20

Table 14: Ranking of Mass Media Education Methods

Individual Methods

Staff resources required for videotape or videodisc instruction are minimal since clients can operate the programs themselves. In fact, if maximum use of the equipment were attained, these instruction methods would actually decrease professional requirements. Expertise beyond present capabilities would be required to develop videodisc programs since there are very few readily available.

The cost of videotapes could be absorbed by the Nutrition Care Division supply budget, but additional equipment would have to be programmed. The cost of videodisc at this point in time is prohibitive especially when considered in relation to expected benefits.

Although not specifically included in the criteria, space would be required for the videotape or videodisc unit that is not currently available in the Nutrition Clinic. A separate room sufficiently large for two units in close proximity to the Nutrition Clinic would be optimal.

The effectiveness of videotape and disc instruction has been demonstrated, but again, results of studies are inconsistent.

The efficiency of these methods is that they can be used with minimal involvement of a dietitian, however, only one person can utilize the equipment at a time. Each videodisc is a 30 minute program if run from start to finish. Stopping the program to

answer questions or to review material would add to this time so that each unit could be scheduled every hour. Each system could then be scheduled over 48 hours per week. At that rate, all patients presently seen for calorie restricted, cholesterol and triglyceride reduction and diabetes classes could receive the initial instruction in this manner. Over 400 hours, or .24 manyears of professional time could be saved per fully operational unit. This statistic would have to be adjusted for professional assistance required by the patient and assessment of instruction understanding, and also for equipment down time. This figure has been adjusted for professional time required to evaluate each patient's nutritional status and individualize a meal plan.

Videotape and videodisc individual instruction methods were rated according to the established cirteria and ranked (see Table 15). Of the two methods, videotape was most feasible for implementation, with videodisc not being a viable alternative primarily because of cost and questionable appropriateness of the sophisticated technology.

	Personnel	Cost	Effectiveness	Efficiency	Total
Videotape	10	5	5	5	25
Videodisc	0	0	5	5	10

Table 15: Ranking of Individual Education Methods

Primary Preventive Nutrition Services

The nutrition education methods found most feasible for implementation at Darnall were assessed for appropriateness in the delivery of primary preventive nutrition services according to the identified criteria. The methods were ranked and are shown in Table 16. Those methods found most appropriate for the delivery of primary nutrition education services were newspaper, lecture, and videotapes.

	Efficiency	Cost	Flexibility	Total
Newspaper	10	10	10	30
Lecture (Media)	10	10	10	30
Video (Media)	5	10	10	25
Video (Ind)	0	5	10	15
Behavioral	5	10	0	15
Interactive	5	10	0	15

Table 16: Ranking of Education Methods for Primary Preventive Services

Secondary Preventive Nutrition Services

The nutrition education methods were then assessed for appropriateness in the delivery of secondary nutrition education services according to the identified criteria. The results are depicted in Table 17. Those methods found most appropriate for the delivery of secondary nutrition education services were interactive strategies, behavioral based programs, and individual operated videotape programs.

	Interaction	Follow-up	Effective	Efficient	Total
Interactive	10	10	5	10	35
Behavioral	10	10	5	10	35
Video (Ind)	5	5	5	10	25
Lecture (Media)	0	0	5	10	15
Newspaper	0	0	5	10	15
Video (Media)	0	0	5	10	15

Table 17: Ranking of Education Methods for Secondary Preventive Services

III. CONCLUSION AND RECOMMENDATIONS

A study was conducted to determine the best method of delivering nutrition education services at Darnall Army Community Hospital. It was found that there was more than one optimal method. Those methods of nutrition education that were found to be most feasible for implementation or continuation were interactive, behavioral, newspapers, community lectures, and videotape. Primary and secondary nutrition activities were determined to require different dissemination techniques.

Newspaper articles, community lectures, and videotapes were found to be most appropriate for primary preventive nutrition activities. This is in concert with the Chief, Clinical Dietetics Branch's priorities to reach a large number of people with the minimum of professional time investment. This is also logical when considering demand versus need services. Because primary preventive nutrition services are based on a professional assessment of need, fiscal and professional resources allocated to them should be minimized. These are, however, important initiatives, so that any method employed should also be efficient.

Behavioral based programs, interactive instructional strategies, and individual videotape programs were found to best meet the criteria for secondary nutrition preventive activities. As pointed out in the literature review, the effectiveness of these strategies are enhanced when used in conjunction with each other and other instructional media. Again, when considering

that secondary preventive nutrition activities are based on demand and are rated highest in importance by the Chief of the Clinical Dietetics Branch, this is where resources should be concentrated.

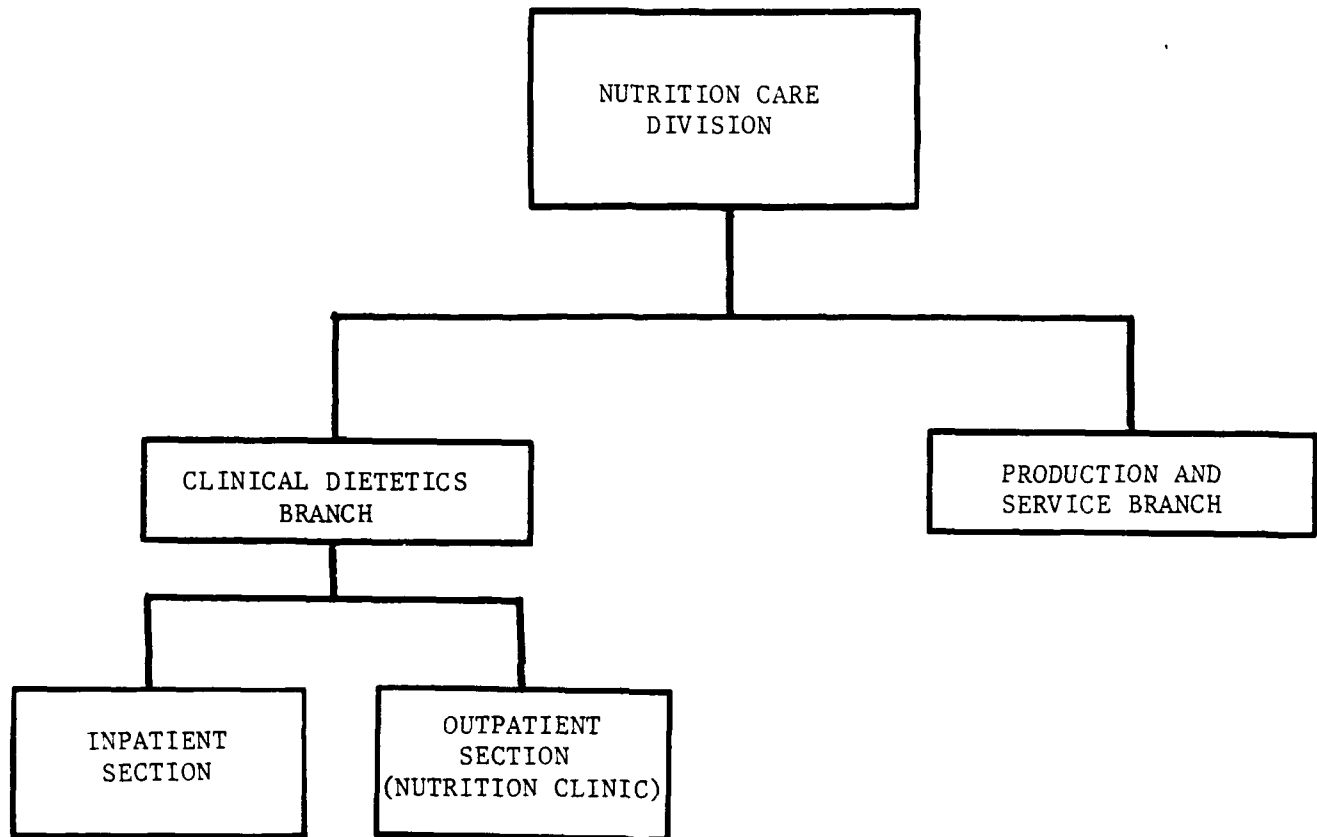
Specific suggestions for implementation of recommendations would be to first, incorporate interactive and behavioral techniques into the calorie restricted, cholesterol and triglyceride reduction, and diabetes classes. Second, calorie restricted classes could be segmented into active duty and non-active duty classes. A variety of instructional media should be utilized to illustrate or reinforce verbal instructions.

The acquisition of a video unit for use by individuals should be considered and researched. This medium could provide effective instruction while decreasing dietitian workload. Use of a videotape for well baby nutrition instruction could also be feasible if a video unit were readily available in the Pediatric Clinic. Although this would decrease countable workload, it would allow dietitians to spend time providing more essential services.

Continued or increased use of newspaper articles is recommended and should be based on the interests of the target audience. Surveys could be conducted to determine what these interests are.

APPENDIX A

ORGANIZATION CHART
NUTRITION CARE DIVISION



Source: MEDDAC Suppl 1 to HSC Reg 10-1

APPENDIX B

CONVERSION OF NUTRITION VISITS INTO TIME FACTORS

Conversion of Nutrition Visits Into Time Factors

Most initial classes were given a time factor of two hours. This is the time required to interview each patient and review their medical record for evaluation of nutritional status and make appropriate notes in the chart (approximately 15 minutes), and present the class (approximately one hour). The Calorie Restricted Class was given a time factor of four hours because it takes three dietitians each one hour to interview approximately four patients (average number of patients per class is 12 as depicted in Table 5). The Prenatal group was given a factor of .33 because it takes approximately 20 minutes to administer the questionnaire. Each Well Baby class takes 15 minutes to deliver, hence the factor of .25.

Follow-up classes for the Calorie Restricted and Diabetic Class were given a time factor of .17. There is a series of six follow-up classes for each of these programs but only one is taught by a dietitian. Patients are entered in on the Nutrition Clinic sign-in sheet because they are all weighed in by the clerk or a medical aide. Each follow-up class is one hour, so the time factor was calculated by the following formula:

$$(1 \text{ class by dietitian} - 6 \text{ follow-up series}) \times 1 \text{ hour/class} = .17$$

Total time spent in providing group instruction and classes was

calculated by multiplying the time factors by the number of classes provided during the year.

Factors used in converting individual visits into hours are taken from the Staffing Guide for US Army Medical Department Activities (DA Pam 570-557 C 4 1979) for the Nutrition Clinic. A factor of 1 is given to initial individual visits and a factor of .2 is given for all follow-up visits no matter what the actual time spent with the client. These factors are intended to include not only the time actually spent in consultation with the patient but also for preparation and for charting in the medical records.

APPENDIX C

EXPLANATION OF CRITERIA SCORING

Explanation of Criteria Scoring

Each nutrition education method was scored for the identified criteria: personnel, cost, effectiveness, and efficiency.

For the personnel criteria, if no additional personnel, expertise, or time was required to adopt the new method, a score of 10 was given. If the method required additional time, a score of five was given. Also, if the expertise was not available in the Nutrition Clinic but was available on Fort Hood, or could be obtained through a training course, a score of five was given. If the method required additional personnel, or the expertise was not available it was given a score of zero.

If no additional cost was required or the cost was minimal, such as for the purchase of teacher's manuals and pamphlets, a score of 10 was given. A score of five was given if items could be purchased with supply dollars or could be feasibly programmed under MEDCASE or CEEP. Zero was given if the cost would likely be considered unfavorably for purchase.

Nutrition education methods that were shown to be effective in studies were given a score of five. Those methods with insufficient information in the literature reviews and those that had been shown to be ineffective were given a score of zero. No method was given a score of 10 as the results of studies were consistently inconsistent.

Efficiency was rated on two factors: the ability to reach large numbers of people per education session or activity and the

ability to count the participants in workload accounting. Although the dietitian's primary concern should be to disseminate information, if the efforts are not credited to workload the effort tends to be thought of as optional. A rating of zero was given to methods that must be delivered on a one-to-one client to clinician ratio. A rating of five was given to methods capable of reaching groups of people but with no credit to workload. This rating was also given to group classes where participants also met individually with clinicians. A rating of 10 was given to methods capable of being implemented in groups with no requirement to meet individually with patients on a regularly scheduled basis. If a method was capable of replacing the dietitian effectively it was given a 10.

In the scoring of primary and secondary preventive activities several additional criteria were introduced: flexibility in message length, group interaction, and follow-up.

Message length in primary prevention is often a function of the medium used. If the medium was capable of flexibility in message length, it was given a score of 10. If the medium was partially capable of flexibility in message length, it was given a score of five and if the medium was incapable of flexibility it was given a zero.

Methods were given a score of 10 for group interaction if they were capable of introducing this instruction strategy. If the method was only partially able to introduce group interaction

activities, it was given a five. If the method was unable to introduce interactive strategies, it was given a zero.

If methods were conducive to planning follow-up sessions, the method was given a score of 10 for the follow-up criteria. If the method relied on clients to follow-up on their own initiative, a score of five was given, and if the method was not capable of effective follow-up a score of zero was given.

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APPENDIX D

FORT HOOD SENTINEL ARTICLES

Thursday, June 23, 1988, THE FT. HOOD SENTINEL

Heart disease**High cholesterol increases risks**Darnall Army
Community Hospital
NEWS RELEASE

Coronary heart disease (CHD) is the number one cause of death of American adults today. About 5 million Americans suffer from overt symptoms of CHD and many others have CHD, but do not know it. Often the first sign many people have of CHD, is a heart attack.

SCIENTIFIC RESEARCH has shown that people with a high blood cholesterol increase their risk of CHD. Cholesterol is a waxy substance produced in the liver and obtained in the diet. It is carried in the bloodstream in tiny droplets called lipoproteins. There are two major types of lipoproteins we need to be concerned about — low density lipoproteins, or LDLs and high density lipoproteins, or HDLs. LDLs are the major carriers of cholesterol in the blood and are often referred to as the "bad" cholesterol because they are the ones that are deposited on the blood vessel walls. HDL is considered the "good" cholesterol because it carries excess cholesterol back to the liver to be removed from the body. So, a high level of HDL is desirable to reduce the risk of heart disease.

Scientists have shown that the high fat (especially saturated fat), high cholesterol diet Americans consume, contributes to high levels of cholesterol. They have also shown that cholesterol levels can be reduced by following a diet low in all saturated fats and cholesterol.

According to the American Heart Association, the current American intake of saturated fats is 15-20 percent, while the recommended intake is 10 percent. The current intake of unsaturated fats is 20-25 percent, while the recommended intake is 20 percent. The current intake of cholesterol, MG per day is 450-500, while the recommended intake is 300 percent.

REDUCING TOTAL fat intake from 40 to 30% of total calo-

**HELP YOUR HEART
FIGHT CHOLESTEROL**

ries should be accomplished largely by reducing saturated fat intake.

What do these recommendations mean in terms of specific food changes? They mean cutting down on foods high in saturated fat and cholesterol. Saturated fats and cholesterol are found in foods of animal origin, such as meats, full fat dairy products and eggs. So, it is important not to totally eliminate these foods from the diet, just choose them less frequently, use smaller portions, select lowfat or skim varieties.

The following are tips for lowering saturated fat and cholesterol in your diet.

Select lean cuts of meat and trim all visible fat; remove skin and fat from poultry and eat all meats in moderate amounts.

Substitute lowfat or skim milk dairy products for full fat dairy products.

Eat less organ meats and fatty meats, such as bacon, sausage and luncheon meats.

Limit egg consumption to 3 per week; this includes eggs used in recipes.

Limit fried foods, especially those fried in animal fats or shortening. Commercial foods are fried in saturated fats.

AVOID TROPICAL vegetable oils, such as palm, palm kernel and coconut which are high in saturated fats.

Limit consumption of baked goods made with butter or shortening, such as croissants, doughnuts, and other pastries.

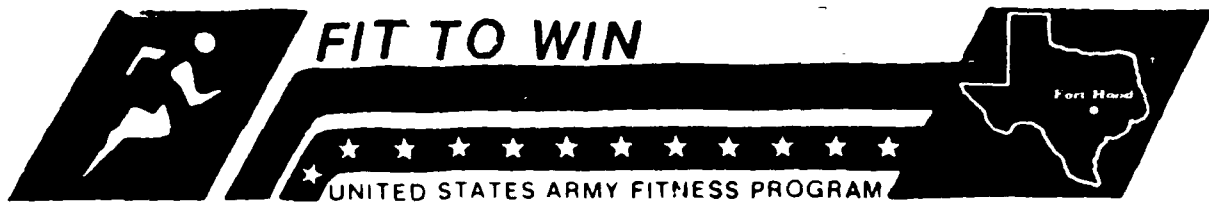
Limit consumption of ice cream and high fat desserts.

Eat more fruits, vegetables and whole grain breads and cereals.

Remember, there are other factors that effect HDL and LDL cholesterol in the blood. Exercise will help increase HDL cholesterol and help reduce obesity which contributes to elevated cholesterol levels and high blood pressure. Increasing dietary fiber can also help reduce the harmful effects of saturated fats in the diet.

The most important thing to remember about coronary heart disease is that we can do things to help reduce the risk of developing it. We have some important choices to make, choices which may affect the length and quality of our lives. By modifying our diet to be lower in fat and cholesterol, giving up smoking, exercising more, and controlling stress, we can reduce our risk of CHD.

Thursday, May 12, 1988, THE FT. HOOD SENTINEL



Sodium intake needs monitoring

Most consumers have heard that excessive salt intake may influence their health. Many have become interested in the salt content of their diet. Some may have already taken steps to reduce salt intake.

IN RESPONSE to this concern, many food manufacturers have started producing products with less salt. This sounds good, but keep in mind that some manufacturers may be more interested in selling their products than in your health. Often products with "less salt" are only so relative to their "more salt" counterparts. A "less of a lot" may not be "less enough."

Sodium is an essential mineral in our diet, but is so readily available in foods and water that a deficiency of sodium is rare. Table salt is 40 percent sodium.

The actual physiological requirement for sodium is 220 mg per day, the amount in only a tenth of a teaspoon of salt. The average American consumes 6,400 to 12,800 mg sodium or two to four teaspoons of salt daily in the foods and beverages they consume. The suggested RDA for adults is 1,100 to 3,300 mg of sodium per day.

Cutting down on the amount of salt used in cooking (using one-half called for in the recipe) and not adding any at the table is a good start to lowering sodium intake. Only 33 percent of total daily sodium intake comes from adding salt in cooking or at the table. The remaining 67 percent is "hidden" in a variety of sources and cannot be seen. Therefore, to become a professional sodium-seeker, one must become a label reader. Most consumers believe

they do not eat foods high in sodium, but too often they are misled.

WHEN READING product labels, including medications, look for the ingredients, the nutrition information per serving and servings per container. Ingredients are listed in relation to the amount per weight in the product — the largest ingredient being first.

Sodium will be disguised as monosodium glutamate (MSG), baking soda (sodium bicarbonate), baking powder, disodium phosphate, sodium benzoate, and other forms of sodium. Food items generally very high in sodium include meat tenderizers, seasoning salts, soy sauce, packaged salad dressings and all processed or convenience foods. Some medications also contain high amounts of sodium.

As mentioned, it is important to note the serving size and number of servings per container. For example, low salt water packed tuna contains 310 mg sodium per serving (a third less than the regular brand), but there are three servings per 6.5-ounce can, so if you ate the whole can, you would consume 930 mg and just about meet the RDA for sodium for the day.

There are many publications published to help consumers lower sodium intake. Contact your local American Heart Association or the Nutrition Clinic at Darnall Army Community Hospital for materials available.

IF YOU or your family have any questions related to nutrition, seek the advice of a Nutrition expert or a Registered Dietitian. For more information contact the Nutrition Clinic, DACH at 288-8860.



Thursday, April 7, 1988, THE FT. HOOD SENTINEL



Cereal brands vary sugar content

Some people seem to think that sugared cereals are more nutritious than candy and cookies. What they don't know is that some cereals have as much sugar as candy, cookies, and cake.

ADDING A few vitamins and advertising that the food is healthy and nutritious seems to make some parents feel safe enough not to bother providing the vegetables, fruits and fiber needed for good nutrition.

In fact "cereal" is not a proper term for presweetened cereals which contain 30-55 percent or more sugar. A serving of cereal is usually about 1 ounce and 1 tablespoon of sugar is 12 grams. Thus, a cereal which lists 12 grams of sugar per ounce contains 1 tablespoon sugar in a 1 ounce serving or about 43 percent sugar.

To find out how much of the cereal you buy is sugar, divide the total grams of sugar by 28 and multiply by 100 to get the percent of sugar.

Why is there a concern over sugar? Not only does sugar contribute to dental cares, a relationship has been found between high

sugar intake and obesity, high blood fat levels, and other forms of heart disease.

We also need to be careful not to let sugar replace the more nutritious foods like vegetables, fruits, lean meats, lowfat milk, and milk products in the diet.

Most of the cereals that have a lot of sugar also have added fat. This fat is usually in the form of coconut or palm oil - a saturated fat which contributes to high blood fats and heart disease. Fortunately the amount of fat is small. Do read nutrition labels and avoid those cereals that contain coconut or palm oil or partially hydrogenated cottonseed, soy, or peanut oils.

IN ADDITION, some cereals are low in fiber. Many cereals do not even list fiber content and that's a dead giveaway that the cereal has very little or no fiber. Although there is not a recommended daily allowance for fiber, a good rule of thumb is to include at least 1 gram of fiber per 100 calories.

Increasing fiber in the diet will help reduce the chance of intesti-

nal and stomach disorders, help lower blood cholesterol levels and help reduce constipation. Fiber will also help satisfy one's appetite because of its bulk and therefore may help in weight reduction or maintenance.

Whole grain cereals contain much more fiber than refined cereals. Bran cereals contain the most fiber of all cereals. But be careful of the many bran cereals that also contain added sugar and fat.

It is recommended that you select breakfast cereals with little or no added sugar: less than 30 percent or not more than 4 grams of sugar. Select cereals with no added fat and a good amount of fiber.

Remember, whole grain cereals are best and hot cereals generally have less added sugar or fat than cold cereals as long as you do not but the instant packets.

If you or your family have any questions related to nutrition, seek the advice of a nutrition expert, as a registered dietitian. For more information contact the Nutrition Clinic, Darnall Army Community Hospital at 258-8860.

Supplement vitamins not needed

Most of us know that the best way to obtain needed vitamins and minerals is to eat a so-called "balanced" diet. One that contains a variety of the basic four food groups.

INDEED, the average eater probably never needs supplemental vitamins. Many people, however, believe in being on the "safe side" and thus take extra vitamins as a form of insurance for good health. In fact, sales of supplements have more than doubled in the past ten years. Vitamin and mineral supplements are the fastest-growing over-the-counter pharmaceutical product according to industry statistics.

Vitamins are organic compounds necessary in small amounts in the diet for normal growth and maintenance. There is little or no scientific evidence to support claims that vitamins provide energy, improve appearance, give sex life a boost, reduce stress, prevent or cure diseases or lengthen life. Yet many consumers are attracted by the popularity of these myths and often take large doses of supplemental vitamins and minerals.

Not only is this practice usually a waste of money, but large doses of either single nutrients or

high-potency vitamin/mineral combinations may be harmful to one's health. Contrary to popular belief, there is no required approval of vitamin and mineral supplements so they should not all be assumed safe. Current laws do not allow the United States Food and Drug Administration to limit the amount of nutrients a single pill can contain.

NATIONAL DIETARY surveys show that the majority of Americans get almost all of the nutrients they need through food alone. Some food components such as calcium, iron and fiber, may require thoughtful food selection, but can be obtained easier in a varied diet. In addition to the pleasure of eating, our food provides a unique balance of nutrients which cannot be reproduced in a supplement.

Individuals who do have special needs and may benefit from supplementation, include the following:

- Pregnant or breast-feeding women may need additional iron, folic acid or calcium.

- Women with excessive menstrual bleeding may need to take iron supplements.

- People with very low calorie intakes (less than 1200 calories) may not meet their needs for all



nutrients.

- Some vegetarians may not receive adequate calcium, iron, zinc, and vitamin B-12.

IF YOU ARE concerned about your nutritional status and are thinking about taking a supplement, check with your doctor before taking an over-the-counter dietary supplement. Avoid taking doses of single vitamins or minerals (just zinc, iron, copper, etc...) unless they have been prescribed for a specific reason. Choose a multi-vitamin and mineral supplement that provides no more than 100 percent of the Recommended Daily Allowances

(R.D.A.) for any vitamin or mineral.

FINALLY, watch out for the expensive supplements advertised to be superior because they are "natural". Synthetic and even generic vitamin/mineral supplements are just as good and are cheaper. Your body does not know if a supplement is natural or is synthetic.

If you or your family have any questions related to nutrition, seek the advice of a nutrition expert, ask a Registered Dietitian. Please contact the Nutrition Clinic, Darnall Army Community Hospital at 288 8860.

Women's special nutrition requirements answered

It is important that nutritious selections be made for all family members. Women, in many American households, purchase and prepare the majority of the meals.

THIS MAKES a woman's knowledge of nutrition extremely important for her growing family and for herself. The following recommendations were developed by the American Dietetic Association Task force to help meet a healthy woman's special needs and also to help improve her eating habits and those of her family.

The 14 guidelines are as follows:

1. Eat a daily variety of foods from all major food groups:
2. 3 to 4 servings of dairy foods.
3. 2 low fat servings of meat/meat alternatives.
4. 1 serving of vegetables/fruits.
5. 1 serving of whole grain breads/cereals.
6. Maintain healthy body weight.
7. For adults to lose weight safely and effectively, DO NOT eat less than 1,000-1,200 calories per day and DO NOT skip meals. Increase physical activity (exercise).
8. To gain weight, increase caloric intake and exercise in moderation.
9. Exercise regularly.
10. At least 3 days per week for at least 20-30 minutes.
11. Limit total fat intake to less than 1/3 of daily calories.
12. Eat at least 1/2 of daily calories from carbohydrates.
13. Select complex carbohydrates,

such as beans, peas, pasta vegetables, nuts, seeds and whole grain breads and cereals.

6. Eat a variety of fiber rich foods.

7. Include 3-4 daily servings of calcium rich foods.

Consume low-fat milk, yogurt, cheese.

Increase milk in cooking.

Eat broccoli, sardines with bones, canned salmon with bones, and green, leafy vegetables.

8. Include plenty of iron-rich foods.

Make daily selections from lean meat, liver, prunes, pinto and kidney beans, spinach, leafy green vegetables, enriched and whole grain breads and cereals.

9. Limit intake of salt and sodium containing foods.

10. Rely on foods for necessary nutrients, using vitamin and mineral supplements only under specific circumstances.

11. If you drink alcohol, limit your intake to 1 to 2 drinks daily.

12. Avoid smoking.

13. Diet is only one risk factor so adjust diet, exercise and other health promotional behaviors to correspond with an individual's own identified risk factors.

Hereditry, lifestyle, environment are other risk factors.

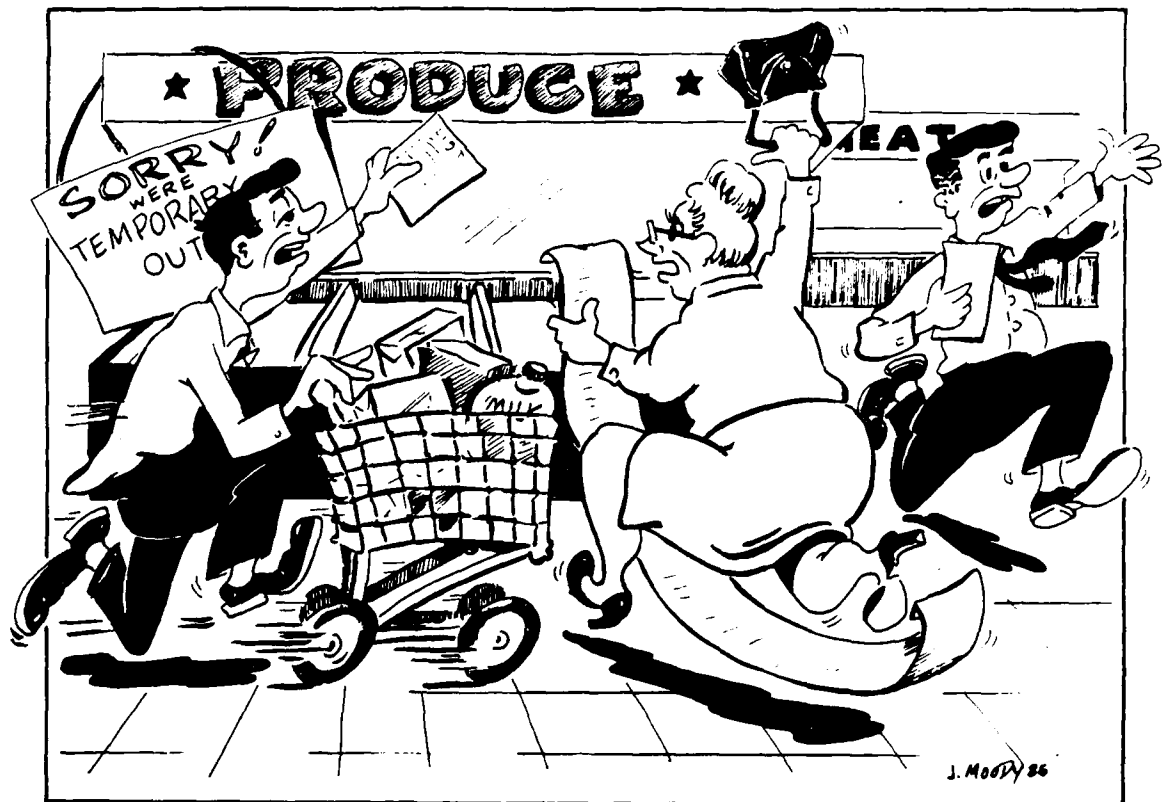
Consult an M.D. with risk factor questions.

14. If you have questions about the adequacy of your diet, consult a registered dietitian-your nutrition expert.

At Fort Hood call the Nutrition Clinic, Darnall Army Community Hospital, at 288-8860.



71 Ask the Dietitian



I've been told over and over again that it's a good idea to drink eight glasses of water every day. Does this mean that I should drink the water in addition to other liquids, or can I drink eight glasses of any liquid? Why is it important?

Water helps maintain body temperature and also works to eliminate waste from your body. Milk and fruit juices can help you meet your fluid needs. They contain nutrients, unlike water, but keep in mind that they also add calories. Drinks containing alcohol and caffeine actually stimulate the loss of fluids through urine. It is important to drink additional liquids if you exercise strenuously so that the fluid you lose through perspiration is replaced.

There has been a lot of talk in the media lately about getting enough calcium in your diet to prevent osteoporosis, the "brittle bone" disease. Can you name some good sources of calcium?

Osteoporosis literally means "porous bones" and can lead to serious injuries (such as bone fractures), when the skeleton becomes too fragile. This condition especially affects post menopausal women particularly in their later years of life. Having an adequate amount of calcium in your diet may help to strengthen your bones, thus preventing the development of osteoporosis. Good sources of calcium include dairy products, such as milk, yogurt, cheese and ice cream, and dark green leafy vegetables, such as broccoli and turnip greens. Canned salmon and sardines are

also a good source, as the soft bones contain calcium and can be eaten.

How can I increase fiber in my diet?

Eat fiber-rich foods throughout the day, such as oatmeal in the morning, a sandwich on whole wheat bread for dessert. If your usual diet is low in fiber, it is important to add fiber gradually and to increase your fluid intake as well.

I'm weight-lifting to build my muscles. Do I need extra protein in my diet since muscles are made of protein?

Exercise helps to tone and build muscles, however, excess dietary protein does not help to increase muscle size. Eat a well-balanced diet, including protein sources such as meat and dairy products, to maintain a high level of fitness.

How can I reduce the amount of salt in my diet?

Avoid using a salt shaker at the table, and use herbs and spices in place of salt in cooking. Avoid salty foods such as chips, cheese, processed meats, pickled foods, T.V. dinners and commercial soups. Use "fresh" foods instead and shop for "low salt" food items. The word "sodium" is often used in place of "salt" in ingredient lists, so be sure to check labels carefully when shopping for food. Try combining seasonings into a "salt free spice mixture" to sprinkle over your foods for extra flavoring.

As a mother I have been advised to sterilize the baby's bottle. How do I do this?

Sterilization kills bacteria and

germs. To sterilize, place the item in water and boil it for twenty minutes. However, sterilization is not necessary for bottles if you use your dishwasher or wash them in hot, soapy water and rinse them thoroughly. Remember, nipples should always be sterilized in boiling water since they tend to crack in the dishwasher.

Is alcohol fattening?

Alcoholic beverages contribute calories and very few nutrients to the diet. Alcohol has more calories per gram (seven cal/gram) than fruit or vegetable juices, and even soda pop (all of which contain 4 cal/gram). The "mixers" used in many alcoholic beverages also add calories.

My kids always ask for sweets and junk food for snacks. They are very active and not overweight. Is it okay to give them these foods?

It's important to develop good eating habits early in life so that the practice can be continued throughout life. A diet high in sweets can lead to dental cavities, poor health and conditions of being overweight. Encourage your children to snack on fresh fruits and vegetables, milk, and crackers with cheese instead of junk food. Make sure these foods are available for them after school and between meals.

I am a diabetic and try to shop carefully for foods, avoiding sugar and excess calories. Is it okay to use the so-called "dietetic" foods?

Be sure and read the labels carefully before selecting a product. The label "dietetic" does not al-

ways mean it is lower in calories or sugar free. Dietetic means a product that has been diet modified; it can be low sodium, low fat, low sugar, etc. Also beware of foods that say sugar-free but contain other sweeteners, such as honey, fructose, sorbitol, xylitol, dextrose, etc.

I've cut down on red meat in my diet and I'm wondering if I get enough protein. Can you offer some suggestions?

There are many good sources of protein, such as fish, poultry, eggs, dairy products and even dried beans and peas. Adults need no more than 5-7 ounces of meat, poultry or seafood daily. Be careful not to over do it though, the protein your body cannot use will be converted to fat.

Which elements in a person's diet has the most calories?

There are six nutrients needed by the human body. Vitamins, minerals and water do not contain any calories but are necessary to help the body use calories. Of the other three nutrients, fat contains nine calories per gram and protein and carbohydrates contain four calories per gram. Ounce for ounce, fats have more than twice as many calories as carbohydrates or protein. Alcohol also contains many calories. It has seven calories per gram and no nutrients.

If you have any questions or concerns related to nutrition, seek the advice of a nutrition expert, ask a Registered Dietitian. Please contact the Nutrition Clinic, Darnall Army Community Hospital at 288-8860.



The weeks between Thanksgiving and New Year's Eve are expensive times for most people, especially around the hips and waist. Thus the "season to be jolly" ends once the New Year arrives and we notice that the turkey was not the only thing stuffed during the holidays.

HOLIDAY celebrations and parties go hand-in-hand, or rather hand-to-mouth, with food and drink; usually a lot more of both than we would ordinarily eat. In addition, cooks put out their best all-too-tempting treats, but this does not mean that if you are watching your weight that you cannot also have those special foods.

To help you keep the holidays lite and avoid adding extra pounds, here are 10 hints. By remaining in control and sticking to your weight management plan you can have a merrier holiday season.

— Make weight maintenance your goal. Losing weight is difficult under the best conditions. A more realistic goal during the holidays may be to maintain your current weight.

— Plan ahead. Pre-plan what

you will eat at holiday dinners and parties. This makes you responsible and being responsible is a step toward changing your habits.

— Do not skip meals or starve yourself before celebrations. Eating two smaller meals during the day prevents overeating at the party.

— Avoid "wasting" calories. Stay away from fat-rich, high calorie foods like dips, sauces, gravies, cheese spreads, rich desserts, nuts, etc. Eat lean and fill up on fresh fruits, raw vegetables, lean meats, and low-fat, low-sugar starches such as rice or potato dishes.

— **THINK BEFORE** you drink. Alcoholic drinks, punches, eggnogs and sweetened drinks are loaded with calories. A few alcoholic drinks can quickly add up to 300-400 calories and also weaken your willpower and cause you to overeat. If you drink, stick to spirits or alternate an alcoholic drink with non-alcoholic drink with non-alcoholic, non-caloric beverages like sparkling mineral water. Take small sips and drink your beverage slowly.

— Choose small servings. Eat

small amounts of many foods rather than large portions of those high caloric favorites.

— Eat only special foods. If a food is not unique to the "holidays" like rolls, dips, etc., skip it and spend calories only on "special holiday" foods. Remember each chip has about 15 calories and a handful of nuts can have almost 500 calories.

— Eat only until you are full. This does not mean until you are stuffed. Allow yourself at least 20 minutes to eat because it takes that long before you will feel full. Remember your priority. Do you want to feel uncomfortable stuffed and risk a weight gain, or would you rather feel in control and comfortable?

— Increase exercise. Exercise three to four times per week. Take a walk and visit rather than sit in front of a plate of snacks. Get down on the

floor and play with the kids. Remember, as you move it, you lose it.

— **KEEP A** proper perspective. The holidays are a time when family and friends gather together to celebrate the joyous season. Focus on the people at celebrations instead of the food. Who knows what kind of interesting people you may meet?

Discover and enjoy the sights and sounds of the holiday season instead of concentrating on its tastes. As you celebrate with friends and relatives, make a commitment to yourself to stay in control of your weight management plan. If you are eligible for care at Darnall Army Community Hospital and would like some help in losing weight before or after the holidays, contact the Nutrition Clinic, 288-8860.

Have a happy, healthful, New Year.

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