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**13. ABSTRACT** ***(Maximum 200 Words)***

This project developed patient educational materials for lower-income African American and Hispanic women with breast cancer and cancer-related pain. The development of the materials was guided by the results of studies designed to establish the educational needs of women of each ethnic heritage. A manuscript describing the results of our baseline studies has been published in *Cancer*, and three book chapters have been written using project data. The results of the baseline studies indicated that over half of the minority women were experiencing severe pain and that their physicians underestimated pain severity. The second study found that the women's health care providers demonstrated conservative pain management practices. They reported inadequate pain assessment and patient reluctance to report pain as top barriers to optimal pain treatment. The patient educational materials are designed to teach women how to communicate with their providers about their pain. The materials also discuss effective pain management and dispel myths about opioid medications. The educational materials are being tested in a randomized clinical trial at sites that serve minority patients. Patient recruitment and accrual have been slow but are gradually increasing. An additional one year unfunded extension has been requested to finish the clinical trial.

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## INTRODUCTION

Improving pain control for patients with metastatic breast cancer will significantly reduce the morbidity of this disease. It is estimated that 178,700 women are newly diagnosed with breast cancer in the U.S. each year (Landis et al., 1998). Approximately 70% of these women are diagnosed in the early stages of the disease, due mainly to progress in screening and diagnosis. Despite improvements in cancer care for patients with early stage disease, a large number of patients will still develop metastatic disease, and mortality rates for these patients remain relatively constant. Minority women are more likely than white women to have advanced disease at diagnosis, and treatment outcomes are worse for minority women (Freeman & Wasfie, 1989). Improving the quality of life of patients who will die of their disease, especially controlling their pain, should be as much a priority for these patients as improving the therapeutic approaches for their disease.

Women with metastatic breast cancer, especially those from minority populations, are not receiving optimum pain control. While it is estimated that pain could be well controlled in over 90% of patients with cancer (Foley, 1985), data from a recent national study indicate that 43% of women with metastatic breast cancer and pain are not adequately treated by the standards of the World Health Organization (Cleeland et al., 1994). Compared with other patients who have pain due to metastatic disease, women are more likely to be undertreated than men, and patients from sites treating primarily African American or Hispanic patients are three times as likely to receive inadequate analgesics. Minority patients recognize that they are undertreated for cancer-related pain. They report more frequently than majority patients that they need more medication for pain, that they have limited pain relief from pain treatment, and that their medications provide a short duration of relief (Cleeland et al., 1997). Minority patients also report more pain-related impairment of function than majority patients.

Poor cancer pain control is a function of patient, health care professional, and health care system factors (Cleeland, 1984; Ward et al., 1993). Our project addresses patient factors that are amenable to change through educational intervention. These patient-related factors include the belief that pain is inevitable, fears of addiction to analgesics, fears of building tolerance to analgesics, and fear of reporting pain to health care providers.

This project developed patient educational materials on cancer pain management, both video and written, for African American women and Hispanic women. The project began with studies designed to establish the specific educational needs of women of each ethnic heritage. In consultation with medical experts of both African American and Hispanic descent, video scripts were written that covered the perceived barriers to good pain control in both groups. These scripts were reviewed by separate focus groups of women with breast cancer and pain from each group to determine the best presentation style for the educational materials. Specific educational materials developed for each group, African American and Hispanic, are being tested in a randomized clinical trial, entering women with breast cancer from each heritage group.

This project is based on the premise that patients who expect pain relief and are able to communicate their distress are liable to promote more responsive pain management from their health care providers. Identifying patient concerns and behaviors that limit effective pain management and providing gender and heritage-specific information and skills training to modify these concerns and behaviors may present the most effective way, at least in the short term, to reduce the percentages of

patients whose functioning is impaired by pain. The skills training for minority patients is predicated on our assessment of the specific information and skills they need to manage their pain.

## BODY

The first task in our statement of work was to assess the needs of minority breast cancer outpatients for information and skills needed to manage pain. The second task was to develop multi-media education and training materials that are linguistically and culturally appropriate for low socioeconomic status (SES) Hispanic and African American populations. The final task is to test the effectiveness of these materials in a randomized clinical trial. To accomplish these tasks, we established a multi-disciplinary team to meet project goals. Using the results of baseline studies that assessed the educational needs of our patient populations (see 1998 progress report), we produced and edited the educational materials. We are evaluating the effectiveness of the educational tools in a randomized, controlled clinical trial for low SES African American and Hispanic outpatients with metastatic breast cancer and disease-related pain. If this program is effective, it can easily be introduced by other care centers where these patients are treated.

Prior to the implementation of the clinical trial, the production of the two videotapes was completed. The scripts for the videos were finalized after analysis of focus group data and consultation with project consultants. The printed materials, booklets on pain management for African American and Hispanic women, were developed after consultation with experts on minority health education and pain management.

A pilot study was conducted at several sites before the full clinical trial began. Sites participating in the pilot study included Jackson Memorial Hospital in Miami, Los Angeles County Medical Center in California, LBJ General Hospital in Houston, and the University of Texas M. D. Anderson Cancer Center (UTMDACC) in Houston. The purpose of the pilot study was to train the site research nurses and data managers in patient identification, recruitment, data management and data transfer procedures that would be employed in the trial. We are now conducting the full clinical trial in multiple sites that serve minority populations.

In our previous report we listed the sites where the clinical trial would be conducted: 1) Jackson Memorial Hospital in Miami, Florida, 2) Ben Taub General Hospital in Houston, Texas, 3) LBJ General Hospital in Houston, Texas, 4) UTMDACC, Houston, Texas, and the Veterans Affairs Medical Center-Houston. Recruitment and accrual of minority patients who are eligible for the clinical trial has been an ongoing challenge. In an effort to improve accrual, we have added one additional study site: the San Juan Community Clinical Oncology Program (CCOP) that includes three hospitals in San Juan, Puerto Rico.

In addition to the above efforts to improve accrual, we have contacted numerous oncology programs that provide services to African American and Hispanic women with breast cancer. These programs include: Memorial Sloan Kettering/Harlem Hospital in New York City, Jefferson Medical College in Philadelphia, Pennsylvania, University of Medicine and Dentistry of New Jersey, University of Maryland, Emory University and Grady Memorial Hospital in Atlanta, Louisiana State University Medical Center and Tulane University in New Orleans, University of Illinois at Chicago, University of

Chicago, East Texas Medical Center, University of Texas Medical Branch in Galveston, Spohn Memorial Hospital in Corpus Christi, Martin Luther King Hospital in Los Angeles, Kansas University Medical Center, and Wayne State University in Detroit. Many investigators at these institutions are interested in issues related to the treatment of minority women with breast cancer. However, the investigators also were experiencing difficulty recruiting minority patients for clinical studies and were not willing to add a protocol that might compete with existing studies. Also, many clinicians we spoke with who work with minority patients were enthusiastic about our study but lacked sufficient time to devote to clinical research.

We are continuing to work with the staff from the Intercultural Cancer Council and The Diversity Programs department at UTMDACC in order to address the recruitment and retention issues. Data management for the project is directed by the Community Oncology Program at UTMDACC, the data management center for the M.D. Anderson NCI-funded CCOP (Community Clinical Oncology Program) research base. A data base and a system for quality control of project data for the clinical trial are being utilized.

## SUMMARY OF RESEARCH ACTIVITY IN THE LAST YEAR:

### Clinical Trial of Pain Management Skills for Outpatient with Breast Cancer (Task 3)

The clinical trial began in October 1998. At that time the clinical trial was initiated at the following sites under the direction of the site investigators in parenthesis: 1) Jackson Memorial Hospital (Stephen Richman, M.D.), 2) LBJ General Hospital, (Vicente Valero, M.D.), 3) UTMDACC, (Vicente Valero, M.D.).

Due to slow accrual at the three sites, we added three additional sites: Ben Taub General Hospital in Houston (Garrett Lynch, M.D., site investigator), the Veteran Administration Medical Center, Houston (Shirley Laday Smith, R. N., site investigator), and the San Juan CCOP (Luis Baez, M.D., site investigator) in Puerto Rico. Ben Taub General Hospital is a large county hospital that serves low socioeconomic status patients. The women's health clinic at the VA Medical Center follows women with metastatic breast cancer. The San Juan CCOP consists of three institutions where recruitment and enrollment began during the past year: San Juan City Hospital, Veterans Affairs Medical Center-San Juan, and the San Juan-Gonzales Martinez Oncology Hospital.

*Methods*: The patient eligibility criteria for the clinical trial include: (1) outpatients with recurrent or metastatic breast cancer, (2) African American or Hispanic, (3) 18 years of age or older, (4) pain due to cancer with a pain worst score of 4 or greater on a 0-10 scale, (5) ECOG performance status of 0, 1, or 2, (6) no current major psychiatric illness, (7) no major surgery within the past 30 days, (8) no current palliative radiotherapy to the site of pain, and (9) lower socioeconomic status.

Patients who agree to participate in the study and provide written informed consent are randomly assigned to either the pain management educational intervention or the control condition. Patients in the pain management group are shown the videotaped presentation on cancer pain treatment specifically tailored to their ethnicity and receive a handbook on cancer pain management. The research nurse/data manager meets with the patient to discuss any questions and to stress the

importance of reporting pain and lack of pain relief to the health care team. The patients who are randomly assigned to the control condition are shown a videotaped presentation on nutrition for cancer patients and receive a booklet on nutrition during cancer treatment. The research nurse/data manager meets with the patient to discuss any questions related to nutrition.

The physicians of patients in both groups continue to treat the patients' pain at their discretion. Patient assessments are scheduled at baseline (day one) and during weeks 2, 6-7, and 8-10. The outcome measures include the Brief Pain Inventory, SF-12 Health Survey, Pain Control Scale, and the Physician Pain Assessment Survey.

*Accrual:* Twenty women with metastatic or recurrent breast cancer have been registered in the study. Accrual was interrupted at the Houston and Miami study sites when the bilingual research nurses enrolling patients left their positions (for reasons unrelated to the project). We now have hired bilingual research nurses at the Houston and Miami sites who are recruiting patients for the study. The nurses are culturally competent and have received extensive training in recruiting minority patients for clinical trials.

| Institution | African-American | Hispanic | Total |
|---|---|---|---|
| Ben Taub Hospital | 1 | 2 | 3 |
| LBJ General Hospital | 2 | 1 | 3 |
| M.D. Anderson | 2 | 2 | 4 |
| Jackson Memorial Hospital | 4 | 6 | 10 |
| San Juan Puerto Rico CCOP | 0 | 0 | |
| TOTAL | 9 | 11 | 20 |

## KEY RESEARCH ACCOMPLISHMENTS

- Additional site recruited for the clinical trial (San Juan CCOP, Puerto Rico)

- Results from the preliminary studies published in *Cancer.*

- Bilingual research nurses recruited for the Houston and Miami sites, following the departure of previous research nurses working on the project.

## REPORTABLE OUTCOMES

### *1. List of abstracts and manuscripts:*

#### *Abstract:*

Karen O. Anderson, Tito R. Mendoza, Cynthia DeLeon, Guadalupe Palos, Patricia Washington, Charles S. Cleeland. Multi-Symptom Assessment in Minority Women with Breast Cancer. Presented at the Era of Hope Meeting for the Department of Defense Breast Cancer Research Program, Atlanta, GA, June 8-11, 2000.

Cynthia M. DeLeon, Karen O. Anderson, Tito R. Mendoza, Charles S. Cleeland. Use of a Daily Postcard Diary to Assess Pain in Underserved Outpatients with Cancer-Related Pain. Presented at the American Pain Society Annual Meeting, Orlando, FL, October 20-24, 1999.

#### *Papers:*

Anderson KO, Mendoza TR, Valero V, Richman SP, Russell C, Hurley J, DeLeon C, Washington P, Palos G, Payne R, Cleeland CS. (2000). Minority cancer patients and their providers: Pain management attitudes and practice. *Cancer*, 88: 1929-38.

#### *Book Chapters:*

Anderson KO, Syrjala KL. How to assess cancer pain. In DC Turk, R Melzack (Eds). Handbook of Pain Assessment, Guildford, in press.

Anderson KO, Cleeland CS. Assessment of cancer-related symptoms. In K Nelson (Ed). Palliative Care for the Oncologist, in press.

### *2. Funding applied for based on work supported by this award*

In July 1998 we submitted an application to the Texas Medical Center in Houston with the intent of applying the same model we used in this research to develop the pain education materials for Chinese Americans with cancer. Dr. Charles Cleeland and Dr. Shelley Wang received a Fleming Davenport Award from the Texas Medical Center, and the first phase of the study opened in March 1999. The first phase of this project is nearing completion. The pain management needs and concerns of Chinese American cancer patients have been assessed through a series of structured interviews and psychometric assessment. Planning and production of relevant patient education materials is scheduled to begin in the next year.

### *3. Employment or research opportunities applied for and/or received on experiences/training supported by this award*

In September 1999 Patricia J. Washington, a recent graduate from the doctoral program at The University of Texas School of Nursing, applied for an NIH research supplement for underrepresented minorities. Dr. Washington worked in the Pain Research Group on our minority studies under Dr. Cleeland's direction for three years. The initial supplement application was not funded, but Dr. Washington was invited to revise the application and resubmit. The resubmitted application was approved and funded. Due to a delay in funding, Dr. Washington accepted a position with a pharmaceutical company and will not accept the research supplement funding. However, she remains a consultant to our project on minority recruitment and culturally sensitive patient education.

## CONCLUSIONS

The results from our initial needs assessment studies (see 1998 progress report) documented that the majority of Hispanic and African American women were not receiving analgesics of an appropriate strength for their pain, and that physicians underestimated pain severity in these minority breast cancer patients by as much as 77%. Improving patient-health care professional communication about pain should be associated with more appropriate analgesic prescriptions. Underestimation of pain severity can be due to inadequate assessment of pain and pain relief, and patient reluctance to report pain, all of which were reported by the health professionals as major barriers to pain management in our project sites. Critical goals of the educational materials are to encourage patients to report pain and to give them the skills to describe their pain and the adequacy of their pain relief. Our educational and video materials address the reluctance of minority breast cancer patients to report pain and encourage them to do so before pain becomes very severe. In addition, the training materials provide information about how to take analgesics and how to manage side effects.

Our educational materials address the ethnic-/specific educational needs of African American and Hispanic women with breast cancer who are experiencing pain. In addition to the obvious requirement for both English and Spanish versions of the materials, the specific content receives differential emphasis. Hispanics often are more concerned with becoming addicted to medication and worrying about using "too much." They also have more concerns about whether analgesics really relieve pain. The Hispanic materials include a greater emphasis on the family as involved in the pain treatment, with ways of reassuring family members about the minimal risk of addiction to opioids used for pain control. African American breast cancer patients may tend to be more isolated in negotiating their pain treatment. Their educational materials include special reinforcement for being their own advocates for pain relief. African Americans are also more likely to take their medications only when needed rather than as prescribed. The pharmacologic rationale for around-the-clock analgesics receives special emphasis in their educational material.

The effectiveness of the educational materials is being evaluated in the clinical trial. Patient recruitment and accrual have continued to be slow and were interrupted by the departure of two bilingual research nurses working on the project. However, we believe that the addition of the Puerto Rico CCOP site and the recent addition of two bilingual research nurses will significantly improve our accrual for the clinical trial.

As mentioned in previous reports, along with the accrual issues, Dr. Cleeland's relocation and the interruption in available research funds resulted in major delays in research activity. As mentioned in the previous progress reports, at the time of the original award Dr. Cleeland was a Professor of Neurology at the University of Wisconsin - Madison. In September of 1996, Dr. Cleeland and the Pain Research Group relocated to the University of Texas M.D. Anderson Cancer Center (UTMDACC) in Houston. Because of Department of Defense policy, the awarded home of the project remains at the University of Wisconsin. We experienced difficulty in locating a replacement PI at the University of Wisconsin. Dr. Kurt Hecox, Professor of Neurology at the University of Wisconsin, agreed to be the project PI. In the fall of 1997 Dr. Hecox and the University of Wisconsin Medical School submitted a request to the Department of the Army to name Dr. Hecox as the replacement PI and to subcontract the project work to UTMDACC, with Dr. Cleeland as the subcontract PI. This request was approved, and the subcontract funds became available in February 1998. Thus, the project did not have any available research funds for approximately 18 months. This interruption in support for the project is another reason that we are behind schedule in the clinical trial. We have requested approval of an additional one-year unfunded extension of the grant in order to allow completion of the clinical trial.

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# Appendix 1

## Minority Cancer Patients and Their Providers: Pain Management Attitudes and Practices

# Minority Cancer Patients and Their Providers

## *Pain Management Attitudes and Practice*

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Presented as a poster at the 1998 Annual Meeting of the American Pain Society, San Diego, California, November 5–8, 1998.

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**BACKGROUND.** The goals of the current studies were: 1) to determine the pain treatment needs of socioeconomically disadvantaged African-American and Hispanic patients with recurrent or metastatic cancer and 2) to assess the attitudes of health care professionals who treat them.

**METHODS.** In the first study 108 African-American and Hispanic patients with metastatic or recurrent cancer and pain completed a survey about their pain intensity, pain interference, and attitudes toward analgesic medications. Physicians also rated their patients' pain and the adequacy of the patients' current analgesic prescriptions was assessed. In the second study 55 physicians and nurses who treat these patients completed a questionnaire regarding cancer pain and its management in their practice settings.

**RESULTS.** Approximately 28% of the Hispanic and 31% of the African-American patients received analgesics of insufficient strength to manage their pain. Although the majority of patients received appropriate analgesics, 65% reported severe pain. Physicians underestimated pain severity for 64% of the Hispanic and 74% of the African-American patients. Physicians were more likely to underestimate the pain severity of female patients than male patients. Inadequate pain assessment, patient reluctance to report pain, and lack of staff time were perceived as barriers to pain management.

**CONCLUSIONS.** Although the data suggest recent improvements in analgesic prescribing practices for African-American and Hispanic cancer patients, the majority of patients reported high levels of pain and limited pain relief from analgesic medications. Inadequate pain assessment remains a major barrier to optimal cancer pain treatment. ***Cancer* 2000;88:1929–38.**



**KEYWORDS: attitudes, cancer pain, pain management, minority, Hispanic, African-American.**

It is estimated that > 1 million patients were newly diagnosed with cancer in the U.S. in 1999.[1] The two largest ethnic minority groups with cancer in the U.S. are African-Americans and Hispanics. Minority patients, particularly underserved patients of lower socioeconomic status, tend to present with later stages of disease than nonminority patients.[2,3] Thus, they are at risk for the development of pain that often is associated with metastatic or recurrent disease.

Data from a recent national study defined the prevalence and severity of pain in cancer outpatients and documented significant undertreatment of pain.[4] Forty-two percent of the patients with pain were prescribed analgesics that were less potent than those recommended by the World Health Organization guidelines for cancer pain treatment.[5] Cleeland et al. examined factors that might be predictive of inadequate pain management.[4] There was no significant difference

in the percentage of undermedicated patients being treated at university cancer centers (42%) and the percentage being treated at community clinics (38%). However, 62% of those patients being treated in settings seeing predominately minority patients (African-Americans and Hispanics) were undertreated by the World Health Organization standard. Patients treated in minority settings were three times more likely to be undermedicated than patients seen in nonminority settings.

A follow-up study examined pain treatment in minority outpatients with recurrent or metastatic cancer.[6] The patients were receiving treatment at several types of institutions: university cancer centers, community-based hospitals, oncology practices, and oncology centers seeing primarily minority patients. Sixty-five percent of the minority patients with pain did not receive the World Health Organization-recommended analgesics for their pain, compared with 38% of patients from nonminority settings in the previous study. The minority patients reported less pain relief and were less likely to be assessed adequately for their pain than nonminority patients. The socioeconomic status of the patients was not determined. Given the diversity in treatment sites, the patients most likely represented a wide range of socioeconomic levels.

A survey of pain management practices among physician members of the Eastern Cooperative Oncology Group (ECOG)[7] found that half of the respondents believed that pain management in their practice setting was only fair, poor, or very poor. Inadequate assessment of patients' pain was identified as the top barrier to good pain management. Additional barriers to good pain control identified by these respondents were patient reluctance to report pain and patient reluctance to take pain medications. The results of this study suggest that patients can benefit from education in pain management and learning how to discuss their pain with their health care providers.

Patients who expect pain relief and are not reluctant to take appropriate analgesics should promote more responsive pain management from their health care providers. Evidence from several studies suggests that pain management education for patients can improve pain treatment.[8,9]

Prior to developing a pain management intervention designed specifically for underserved, socioeconomically disadvantaged African-American and Hispanic patients, it is necessary to assess the pain-related educational needs of these patient groups. The literature concerning patient education suggests that interventions tailored specifically for a minority group are more effective than interventions designed for the general population.[10,11]

The current article is an extension of our previous work on pain treatment for minority patients. Our previous study of minority patients did not include data on health professionals' perceptions, attitudes, and knowledge of pain management.[6] In the current article we present data regarding minority patients' pain severity and treatment along with data concerning the attitudes of the health professionals who treat them.

The goals of Study One were: 1) to determine the adequacy of pain treatment among underserved African-American and Hispanic patients with metastatic or recurrent cancer receiving treatment in large public hospitals and 2) to determine the pain-related educational needs of these two patient groups. The aims of Study Two were 1) to determine knowledge of cancer pain and its treatment among physicians and nurses treating the patients in Study One, 2) to assess the providers' perceptions of the current pain management practices at these sites, and 3) to determine the health professionals' attitudes regarding pain management. To our knowledge these two studies are the first to link minority patients and providers to assess pain management practice, attitudes, and behaviors.

## STUDY ONE

### PATIENTS AND METHODS

The subjects were 108 patients (44 African-American and 64 Hispanic patients) with a pathologic diagnosis of cancer and cancer-related pain. Forty-seven percent of the subjects were female. Eligible patients were at least 18 years of age, were ambulatory outpatients who had metastatic or recurrent cancer and disease-related pain, were members of African-American or Hispanic minority group categories, and had an ECOG performance status of 0, 1, 2, or 3.[12] The subjects were recruited between 1995–1997 in the oncology clinics of four large public hospitals that serve primarily underserved, socioeconomically disadvantaged patients. The hospitals are located in Houston and Fort Worth, Texas; Miami, Florida; and Los Angeles, California. The subjects were defined as underserved based on their enrollment for medical services in these hospitals. Their underserved status was confirmed by their health insurance, which was categorized as Medicaid, Medicare, or no insurance. The current study was approved by the Institutional Review Boards of The University of Texas M. D. Anderson Cancer Center and each participating institution.

Research nurses were culturally competent, reflected the ethnicity of patients, and conducted interactions in the patient's language of choice. Consecutive patients who met the eligibility criteria and agreed

to participate in the study were asked to complete the Brief Pain Inventory (BPI)[13] during a scheduled visit to an outpatient oncology clinic. Informed consent was obtained from each patient who participated in the study. The patients completed either the English or Spanish version of the BPI, depending on their preferred language. The BPI asks patients to rate their pain "now," and at its "worst," "least," and "average" during the past week on scales of 0–10. These scales are anchored by "no pain" at the "0" end and "pain as bad as you can imagine" at the "10" end. Using the same type of scales, patients also are asked to rate how their pain interferes with several quality of life domains including general activity, walking ability, mood, sleep, normal work, and relations with others. The scales for the pain interference items are anchored by "does not interfere" at the "0" end and "interferes completely" at the "10" end. The patients also were asked to estimate the amount of pain relief they were receiving from their pain treatment (in percent) and to report concerns regarding taking analgesic medications. Issues of validity and reliability of the English and Spanish language versions of the BPI have been examined in detail.[13,14]

Each patient's physician was asked to complete the Physician Pain Assessment Survey.[4] This instrument asks the physician to rate on a scale of 0–10 the patient's worst pain during the past week, the level of the patient's current pain control, and the degree to which pain interferes with the patient's activities and also with sleep. These data were collected after the patients completed their office visits to include any analgesic adjustments for the status of their pain at the time they completed the BPI. The physician attested to filling out the form without reading the patient's responses on the BPI.

Because poor pain assessment has been identified as a factor in poor pain management,[4] the degree of concordance between physician and patient was indexed by the discrepancy between the patient's and physician's ratings of the patient's worst pain, the extent to which pain was interfering with the patient's activities, and the extent to which the pain was interfering with the patient's sleep. The physician-patient rating discrepancy score (physician rating − patient rating) could range from −10 (physician rating of 0, patient rating of 10) to +10 (physician rating of 10, patient raging of 0).

The research nurse recorded all types and dosages of the patient's current analgesic medications and assessed the patient's ECOG performance status.[12] These data were used to estimate the adequacy of analgesic prescription by computing a Pain Management Index (PMI) for each patient.[15] The PMI is based on guidelines for treating cancer pain from the World Health Organization[5] and the Agency for Health Care Policy and Research.[16] Pain management is considered adequate when there is congruence between the patient's reported level of pain and the appropriateness of the prescribed analgesic drug. The PMI provides a comparison of the most potent analgesic prescribed for a patient relative to the level of that patient's reported pain. To determine the PMI, we classified the most potent analgesic prescribed (for chronic or breakthrough pain) as one of four levels (0 = no analgesic, 1 = nonopioid, 2 = weak opioid, and 3 = strong opioid), and the patient's "pain worst" score from the BPI was classified as mild (1–4), moderate (5–6), or severe (7–10).[15] The PMI is computed by subtracting the pain level from the analgesic level.

Negative PMI scores are considered to be an indicator of undermedication with analgesics, and scores of $\geq 0$ are considered to be a very conservative indicator of acceptable treatment. The PMI score does not include assessment of the medication dosage, schedule, or the patient's adherence to the prescribed medication regimen. The PMI also does not differentiate between immediate-release and sustained-release medications. Thus, a negative PMI score cannot be explained by nonadherence, dosage, schedule, or the use of sustained-release or immediate-release medications. Because the PMI is a conservative measure of the adequacy of pain treatment, we also reported the numbers of patients receiving each level of analgesic whose "pain worst" rating on the BPI was classified as mild, moderate, or severe.[15] Patients who are prescribed appropriate analgesics but continue to report severe pain may not be receiving appropriate dosages or schedules of analgesics or may not be taking their pain medications as prescribed.

### Statistical Analysis

The Fisher exact test[17] was used to compare differences in the proportions of African-American and Hispanic patients with regard to the demographic, disease, and pain-related variables shown in Table 1. Two-sample Student $t$ tests, with the Type I error rate adjusted accordingly, were used to compare mean group scores on the BPI pain severity and interference items in Table 2. Confidence intervals with their appropriately adjusted confidence levels also were reported. The Fisher exact test[18] was used to compare Hispanic and African-American patients with regard to attitudes related to pain treatment (Table 3). All tests were two-sided.

TABLE 1
Demographic, Disease, and Pain-Related Variables among African-American and Hispanic Patients with Cancer[a]

| | African-American patients (n = 44) | Hispanic patients (n = 64) |
|---|---|---|
| Mean age (SD) (yrs) | 55.4 (10.6) | 53.1 (12.6) |
| Percent of patients with good ECOG performance status[b] | 54% | 67% |
| Percent of patients with ≥ 12 years of education | 18% | 5% |
| Percent of patients with negative Pain Management Index[c] | 31% | 28% |
| Percent of patients with severe pain[d] | 72% | 57% |
| Percent of patients whose physicians underestimated their pain | 74% | 64% |
| Percent of patients whose physicians underestimated interference with activities due to pain | 69% | 64% |
| Percent of patients whose physicians underestimated interference with sleep due to pain | 58% | 64% |
| Percent of pain relief from analgesics | 51% | 61% |

SD: standard deviation; ECOG: Eastern Cooperative Oncology Group.
[a] No significant differences observed between African-American and Hispanic patients with regard to any of these variables.
[b] Good Eastern Cooperative Oncology Group performance status is defined as a score of 0–2 on the 5-point scale, in which 0 is fully active and 4 is completely disabled.
[c] A negative Pain Management Index indicates that the patient was not prescribed an analgesic appropriate for her or his pain severity.
[d] Severe pain intensity is defined as a "pain worst" score on the Brief Pain Inventory in the severe range (7–10).

## RESULTS

Demographic data and data on disease and pain-related treatment variables for African-American and Hispanic cancer patients are presented in Table 1. There were no significant differences between the ethnic groups with regard to these variables (Table 1). The African-American and Hispanic patients were comparable with regard to age, ECOG performance status, and reported pain relief from their current analgesic medications. The majority of the patients in both ethnic groups had less than a high school education. Forty-five percent of the patient sample had Medicaid health insurance, 30% had no health insurance, and 9% had Medicare. Health insurance information was not available for 17% of the patients. The health insurance data confirmed the underserved, low socioeconomic status of the patients. The most frequent disease sites for the total patient sample were the breast (28%), colorectum (23%), lung (15%), and prostate (10%). A majority of the patients in each ethnic group demonstrated good ECOG performance status.[12]

TABLE 2
BPI Scores on Pain Severity and Interference Items for African-American and Hispanic Patients with Cancer

| | African-American patients (n = 44) | Hispanic patients (n = 64) | CI of the mean difference |
|---|---|---|---|
| BPI item[a] | Mean (SD) | Mean (SD) | |
| Pain Average | 6.3 (2.4) | 5.1 (2.6) | −2.5, 0.2[b] |
| Pain Least | 4.2 (2.8) | 3.0 (2.6) | −2.5, 0.3[b] |
| Pain Now | 5.2 (3.3) | 4.3 (3.3) | −2.6, 0.9[b] |
| Pain Worst | 7.8 (2.2) | 7.0 (2.8) | −2.2, 0.5[b] |
| Normal Work | 6.5 (3.3) | 5.5 (3.5) | −2.9, 1.0[c] |
| Relations with Other People | 4.2 (3.8) | 3.8 (3.5) | −2.5, 1.7[c] |
| Walking Ability | 5.1 (4.2) | 4.6 (3.4) | −2.6, 1.7[c] |
| Mood | 5.5 (3.7) | 5.4 (3.4) | −2.1, 2.0[c] |
| Enjoyment of Life | 6.6 (3.6) | 5.3 (3.7) | −3.4, 0.8[c] |
| General Activity | 6.8 (3.0) | 6.2 (3.0) | −2.3, 1.1[c] |
| Sleep | 6.5 (3.5) | 5.2 (3.7) | −3.4, 0.7[c] |

BPI: Brief Pain Inventory; SD: standard deviation; CI: confidence interval.
[a] Each Brief Pain Inventory item is rated on a 0–10 scale. The pain severity items are anchored by "no pain" and "pain as bad as you can imagine." The pain interference items are anchored by "does not interfere" and "completely interferes."
[b] 98.75% confidence interval.
[c] 99.28% confidence interval.

TABLE 3
Pain Treatment Attitudes of African-American and Hispanic Patients with Cancer[a]

| Item | African-American patients (n = 44) | Hispanic patients (n = 64) |
|---|---|---|
| Need more information about pain medication | 43% | 55% |
| Need more of current analgesic medication | 33% | 28% |
| Need stronger analgesic medication | 47% | 39% |
| Concerned about using too much medication | 22% | 36% |
| Problems with side effects from medication | 29% | 26% |
| Taking analgesic medication ≤ 2 times/day | 83% | 80% |
| Taking analgesic medication on as needed basis | 66% | 62% |

[a] No significant differences were observed between African-American and Hispanic patients with regard to any of these variables.

The African-American patients reported that only 51% of their pain was relieved by their analgesic medications, whereas the Hispanic patients reported that 61% of their pain was relieved by their medications. To explore this issue further, the PMI was computed for all patients. Thirty-one percent of the African-American patients and 28% percent of the Hispanic patients had negative PMI scores. The majority of the African-American patients (69%) and Hispanic patients (72%) were receiving appropriate analgesics given the intensity of their pain.

To explore possible differences in pain management practice across institutions, the percentage of patients with negative PMI scores was computed for each study site. The percentages ranged from 17% of patients with negative PMI scores at one site to 41% with negative PMI scores at another site. The two remaining study sites had 26% and 31%, respectively, of patients with negative PMI scores.

Table 2 presents the mean BPI scores on the pain severity and pain interference items for the African-American and Hispanic patients. Because there were no significant differences between the two ethnic groups with regard to any of the BPI pain interference or pain severity items, confidence intervals were reported to provide an estimate of the magnitude of differences between the two groups. The mean scores and standard deviations on the pain severity items for both groups indicated moderate to severe pain intensity.[15] Not surprisingly, the patients reported significant interference due to pain in their activities of daily living.

Although the majority of the patients were prescribed appropriate analgesics, 65% of the total patient sample reported "pain worst" scores on the BPI that indicated severe pain. Among the patients with severe pain, 63% were prescribed strong opioid medications (e.g., morphine), 29% were prescribed weak opioids (e.g., codeine), 7% were prescribed nonopioid analgesics (e.g., acetaminophen or nonsteroidal anti-inflammatory drugs), and 1% had no analgesics prescribed. Nineteen percent of the total patient sample reported "pain worst" scores that indicated moderate pain. Among the patients with moderate pain, 24% were prescribed strong opioids, 47% were prescribed weak opioids, 18% were prescribed nonopioid analgesics, and 12%were prescribed no analgesics. Fifteen percent of the total patient sample reported "pain worst" scores that indicated mild pain. Among the patients with mild pain, 29% were prescribed strong opioids, 57% were prescribed codeine-type opioids, and 14% were prescribed nonopioid analgesics.

The frequency of inadequate assessment of pain was indexed by the discrepancies between patients' and physicians' ratings of: 1) the patient's "worst" pain, 2) the patient's level of pain-related interference with activities, and 3) the patient's level of pain-related interference with sleep. Table 1 shows that the physicians underestimated the pain severity of 74% of the African-American patients and 64% of the Hispanic patients. Moreover, 82% of the patients who reported severe pain on the BPI had their pain underestimated by their physicians. The physicians also underestimated the level of pain-related interference with activities and sleep for more than half of the patients in each ethnic group. In addition, the physicians underestimated the pain severity of 79% of female patients compared with 59% of male patients ($P < 0.05$). The physicians also were more likely to underestimate the level of sleep disturbance due to pain in female patients (72%) compared with male patients (51%) ($P < 0.05$).

Table 3 presents the attitudes related to pain treatment of the African-American and Hispanic patients. There were no significant differences between the two ethnic groups with regard to their attitudes. A majority of the patients in both ethnic groups were taking their analgesics on an "as needed" basis as opposed to the "around the clock" schedule recommended by the published guidelines for cancer pain management.[5,16] Eighty percent of the Hispanic patients and 83% of the African-American patients reported taking their analgesics $\leq$ 2 times per day. It should be noted that only 14% of the patients were taking sustained-release analgesics, which require fewer doses than immediate-release analgesics.

Table 3 shows that 55% of the Hispanic and 43% of the African-American patients reported that they needed more information regarding pain management. Approximately one-third of the patients in each ethnic group reported needing more of their current analgesic medication, and more than one-third of patients in each group expressed a need for stronger analgesic medication. More Hispanic patients (36%) than African-American patients (22%) were concerned about using too much medication, but this difference was not significant. Less than one-third of the patients in both groups reported problems with side effects from their pain medications.

## STUDY TWO

Study Two was comprised of a survey of the health care professionals who treated the minority cancer patients who participated in Study One. After determining the adequacy of pain management for the patients, we were interested in assessing the pain-related attitudes of the physicians and nurses providing the pain treatment.

## METHODS

A Cancer Pain Questionnaire[19] was completed by the physicians and nurses with patient care responsibilities for the minority cancer patients from Study One in the oncology clinics at the four study sites. The study was approved by the Institutional Review Boards of The University of Texas M. D. Anderson Cancer Center and each participating institution. The questionnaire was distributed to 48 nurses and 44 physicians. Informed consent was obtained from the respondents by their completion of the questionnaire. The respondents included 29 physicians and 28 nurses. The response rates by profession were 66% for physicians and 58% for nurses.

The survey assessed the health professionals' knowledge and attitudes regarding cancer pain and its treatment, their current pain management practices, and their perceptions of barriers to optimal pain management at their sites. In addition, the health professionals were asked to provide treatment recommendations for a patient presented in a scenario format:

> A 40-year-old male cancer patient is hospitalized with severe untreated back pain of more than 1 month's duration, attributable to bone metastases without vertebral collapse. He weighs 70 kg, has no cardiovascular or respiratory problems, and has a disease prognosis of more than 24 months. He has no history of medication allergies and is opiate naive. What would be your recommendation for initial pain management regimen for this patient?

In a continuation of the scenario, the patient continues to report back pain after a course of radiation therapy:

> The patient's disease status remains stable. There are no signs of complication, and he is having no side effects from the medication. What is the most aggressive analgesic drug regimen that you would recommend?

Information also was gathered with regard to the health professionals' practice setting, their professional training, and their experience with caring for patients with cancer pain. The survey took approximately 20 minutes to complete. Study data were identified only by staff category and study site to insure anonymity and confidentiality.

### Statistical Analysis

Descriptive statistics (frequencies, percents, ranks, or means) for each response were reported. Not all respondents answered each question completely; therefore, the numbers that constituted the basis for the analysis of each item were included with the reported responses.

## RESULTS

A total of 55 questionnaires were completed: 12 from the Houston site, 9 from Fort Worth, 20 from Miami, and 14 from Los Angeles. The response rates were 52%, 73%, 61%, and 67%, respectively, for the Houston, Fort Worth, Miami, and Los Angeles sites. The mean age of the respondents was 39.7 years (standard deviation = 9.9). The health care professionals were 63% female, 14% Hispanic, and 86% of non-Hispanic origin. The racial distribution of the subjects was 68% white, 17% African-American, 11% Asian or Pacific Islander, and 4% other.

A majority of the health professionals (58%; n = 53) reported caring for more than 100 cancer patients during the past 6 months. Ninety-one percent of the health care professionals reported that the majority of the cancer patients they treat are members of an ethnic or racial minority group. A majority of the professionals (62%; n = 53) estimated that 50% or more of the cancer patients they treat have pain that lasts for more than 1 month. Moreover, 94% of the respondents (n = 54) indicated that the majority of cancer patients in general have pain for longer than 1 month.

Although more than half of the health professionals (60%; n = 53) described pain control treatment in their own practice setting as good or very good, 32% rated it as fair, and 8% rated it as poor or very poor. When asked to describe the use of analgesic medication for cancer pain in their practice setting, 71% of the staff (n = 55) reported that patients in their setting receive adequate pain treatment. Moreover, 67% of the health care professionals (n = 55) described themselves as more liberal than their peers concerning the use of analgesics for cancer pain.

### Evaluation of Pain Management Practices

Table 4 presents the respondents' recommendations for the initial pain management regimen for the cancer patient described in the scenario. The majority of the health professionals (96%; n = 49) stated that they would prescribe an opioid analgesic, with 73% of the respondents recommending a "strong" opioid (morphine or a similar drug). However, 22% of the health professionals chose a "weak" opioid (codeine or an equivalent). Only one staff member chose a nonopioid medication as the strongest analgesic to be used. Twelve percent of the respondents chose an opioid regimen that included a nonsteroidal antiinflammatory medication as an adjuvant medication. Although 66% of the staff would administer the recommended medication regimen around the clock, 34% would administer the medication only as needed. The oral route of administration was recommended by 69% of

TABLE 4
Response to Scenario: A 40-year-old male cancer patient is hospitalized with severe untreated back pain of more than 1 month's duration, attributable to bone metastases without vertebral collapse. He weighs 70 kg, has no cardiovascular or respiratory problems, and has a disease prognosis of more than 24 months. He has no history of medication allergies and is opiate naive. What would be your recommendation for the initial pain management regimen for this patient?

| Analgesic regimen | Percent for each response (no. of responses/no. of respondents) |
|---|---|
| Strong opioid | 73% (36/49) |
| Mild opioid | 22% (11/49) |
| NSAID | 2% (1/49) |
| Around the clock | 66% (29/44) |
| PO | 69% (34/49) |

NSAID: nonsteroidal antiinflammatory drug; PO: oral administration.

the respondents. Twenty-nine percent of the respondents recommended an intravenous route of administration of the opioid analgesic. Only one respondent recommended intramuscular administration alone. Compared with the previous survey of ECOG physicians,[7] the health care professionals in the current study were more willing to prescribe a strong opioid (73% vs. 41%) for the patient in the scenario.

In the continuation of the scenario, the patient does not benefit from palliative radiotherapy to treat the pain. The professionals were asked to describe the most aggressive analgesic regimen that they would recommend. Given this scenario, 89% of the respondents (n = 46) included a potent opioid (morphine or equivalent) in their pain treatment recommendations. The oral or transdermal route of analgesic administration was chosen by 80% of the respondents. Twenty percent suggested intravenous administration.

The health care providers were asked to indicate their primary reason for not prescribing more medication than indicated for the patient in the scenario. Of the 43 respondents to this question, 51% reported concerns regarding possible side effects as their reason for not prescribing more analgesics. None of the respondents believed that larger doses would not be more effective whereas 37% were concerned that the patient would build tolerance too rapidly. Twelve percent were hesitant to prescribe more medication due to the possibility of addiction. In the previous survey of ECOG physicians, only 2% of the respondents reported hesitation due to concerns regarding possible addiction.[7]

The professionals treating the minority patients also were asked: "At what disease stage (in terms of prognosis) would you recommend maximum-tolerated narcotic analgesic therapy for treatment of this patient's severe pain?" As shown in Table 5, 48% of the health care professionals (n = 46) would prescribe maximum analgesia if the patient had less than 24 months to live, which was the longest prognosis of the possible responses. However, 48% of the professionals would wait until the patient had less than 6 months to live before recommending maximum analgesia. In the previous ECOG study, 31% of the respondents reported that they would wait until the patient had a prognosis of less than 6 months before prescribing maximum analgesia.[7]

TABLE 5
Response to the Question: "At What Disease Stage (Prognosis) Would You Recommend Maximum Tolerated Analgesia for Treatment of the Cancer Patient's Severe Pain?"

| Prognosis | Frequency | Percent |
|---|---|---|
| <24 months | 22 | 48 |
| <12 months | 2 | 4 |
| <6 months | 8 | 18 |
| <3 months | 6 | 13 |
| <1 month | 6 | 13 |
| <1 week | 2 | 4 |

A large majority of the health care professionals (87%; n = 52) stated that the most likely reason that a terminal cancer patient would request greatly increased doses of pain medication was that the patient was experiencing increased pain. The health care professionals were asked to rank a list of analgesic medications in terms of their preference for the treatment of prolonged moderate to severe cancer pain, based on their knowledge and experience. A large majority (94%; n = 55) rated a strong opioid as their first choice. In the previous survey of ECOG physicians, 62% of the respondents rated a strong opioid as their first choice of analgesic medications.[7]

### Barriers to Pain Control

The health professionals were asked to rank a list of potential barriers to optimal cancer pain management in terms of how they might impede cancer pain treatment in their own setting. Table 6 portrays the percent of respondents (n = 55) ranking each item as 1 of the top 4 barriers. Inadequate pain assessment, patient reluctance to report pain, and inadequate staff knowledge regarding pain management were reported as top barriers by more than half of the health care professionals. Medical staff reluctance to prescribe opiates was ranked as a top barrier by 40% of the professionals.

The responses of the health care professionals were compared with the results of the previous ECOG study of physicians from primarily nonminority clinics.[7] As with the large physician sample, the majority

TABLE 6
Barriers to Optimal Cancer Pain Management Reported by Health Care Professionals Treating Minority Cancer Patients

| Barrier | Percent[a] |
|---|---|
| Inadequate pain assessment | 71 |
| Patient reluctance to report pain | 56 |
| Inadequate staff knowledge regarding pain management | 54 |
| Medical staff reluctance to prescribe opiates | 40 |
| Patient reluctance to take opiates | 36 |
| Lack of staff time to attend to the patients' pain | 34 |
| Nursing staff reluctance to administer opiates | 21 |
| Lack of access to a wide range of analgesics | 19 |
| Excessive state regulation of prescribing analgesics | 17 |
| Lack of psychologic support | 16 |
| Patient inability to pay for analgesics | 14 |
| Lack of access to professionals who practice specialized methods | 13 |
| Lack of available neurodestructive procedures | 13 |
| Too much paperwork | 12 |
| Lack of equipment or skills | 12 |

[a] Percent of respondents who selected the item as one of the top 4 barriers in the survey (n = 55).

of the health care professionals in the minority settings regarded poor pain assessment, patient reluctance to report pain, and inadequate staff knowledge as major barriers. However, some differences in the rankings of the two professional samples were noted. Although the ECOG physicians from nonminority clinics did not rate lack of staff time as a significant barrier, 34% of the health professionals in the current study sample believed that lack of staff time for pain treatment was a major barrier in their settings. In addition, higher percentages of the health care professionals treating primarily minority patients ranked lack of access to a wide range of analgesics (19% vs. 3%) as an important barrier.

### Education in Pain Management

Nearly half (47%; n = 53) of the health professionals reported fair or poor training in cancer pain management. The remainder (53%) of the health professionals reported good or excellent training in cancer pain management. In the previous ECOG survey of physicians, only 12% of the sample reported medical school training in cancer pain management as excellent or good. In the current study, 58% of the professionals (n = 53) correctly identified constipation as the one side effect of opioid medication that does not decrease after repeated administration of the opioid. Thirteen percent of the respondents reported that they did not know which side effect would not decrease.

## DISCUSSION

The results of Study One documented that the majority of both Hispanic and African-American socioeconomically disadvantaged patients receiving treatment for cancer at large public hospitals were prescribed analgesics that were appropriate for the severity of their pain. Approximately 30% of the minority patients were undermedicated for pain. Although the majority of patients were prescribed appropriate analgesics, 65% continued to report severe pain. The patients also reported that their pain medications relieved only 50–60% of their pain. The reason for the discrepancy between their PMI data and perceived pain intensity and pain relief may be due to several factors. The patients may not have received an adequate dose or regimen of their medication. It is possible that the physicians were conservative in their prescribed dosages of analgesics. One limitation of the current study is that we did not assess actual dosages of analgesics.

The current study did assess whether patients receiving sustained-release analgesics also were prescribed immediate-release medications for episodes of breakthrough pain. Patients with severe pain who received sustained-release oral morphine would have a PMI indicating adequate pain treatment. However, if these patients were not also prescribed immediate-release analgesics for breakthrough pain, then their pain management was not optimal. Of the 15 patients who received a sustained-release analgesic, only 2 did not receive an immediate-release analgesic for episodes of breakthrough pain. Thus, inadequate treatment of breakthrough pain does not appear to explain the mean pain severity levels and limited pain relief of the patients in the current study sample.

Another possible reason for the discrepancy between the PMI data and perceived pain intensity is that the patients were not adhering to their prescribed regimens. Although the physicians reported that they generally recommended prescribing analgesics on an "around the clock" basis as recommended by pain treatment guidelines,[5,16] the patients reported that they usually took their pain medications on an "as needed" basis. Thus, if the patients were not adhering to the prescribed schedule of medications, they could not receive the maximum benefit from their pain medications.

There was considerable variability in the adequacy of prescribed analgesics across the study sites, with the percentage of negative PMI scores ranging from 17 to 41%. This variability may be related to several factors. First, the attitudes of the health care providers toward cancer pain treatment also varied across the study sites. The providers with more conservative approaches to pain management probably were less likely to recommend adequate analgesics for the patients. Second, the ethnic background of the providers may influence their ability to communicate with their patients and assess their pain intensity and

pain interference. Finally, the study sites varied with regard to the number of cancer patients typically seen per day in the outpatient clinics. The site with the largest number of patients also had the highest percentage of patients with a negative PMI score. Thus, lack of staff time may hinder adequate pain management. This hypothesis is supported by the results of Study Two. More than one-third of the physicians and nurses rated lack of staff time to attend to patients' pain as a major barrier to optimal pain management.

The results of previous studies have demonstrated that inadequate pain assessment by health care professionals is a major predictor of undertreatment of cancer pain.[4,6] The physicians treating the patients in Study One typically underestimated the pain severity and interference in general activity and sleep due to pain that the patients were experiencing. Inadequate pain assessment was significantly more likely for female compared with male patients in both ethnic groups. This gender difference also was found in our previous study of outpatients with metastatic cancer.[4] Accurate appraisal of pain and pain interference may be more difficult for patients who are not of the same gender or ethnic background as the treating physicians. The majority of the physicians treating the patients in Study One were white males.

In spite of the variability across treatment sites, the overall results suggest recent changes in physician willingness to prescribe strong analgesics for minority patients compared with our previous study, which found that 65% of African-American and Hispanic patients were undermedicated for cancer pain.[6] The reason for this improvement in pain management practice may be related to the timing of the data collection. The data for the ECOG survey of minority patients[6] were collected between 1991–1994. The patients in the current study were surveyed between 1995–1997. It is likely that the pain management practice of health care professionals treating oncology patients changed during the interval between 1991 and 1997. The practice change may have resulted from several factors, including the publication of the Agency for Health Care Policy and Research guidelines for cancer pain treatment.[16] In addition, professional organizations such as the American Society of Clinical Oncologists and the American Pain Society have developed continuing education programs designed to improve cancer pain treatment. Also, the research nurses collecting data for the current study and the oncologist coinvestigators may have served as role models for pain management practice in their settings.[20]

The assessment of attitudes toward pain and pain treatment did not reveal any significant differences between the African-American and Hispanic patients. Our previous study of minority patients found that Hispanic patients were more concerned about taking too much pain medication and reported more problems with side effects and a greater need for information regarding pain management than African-American patients.[6] The smaller sample size in the current study may account for the discrepancy in the results. In addition, the improvement in pain management practices since the previous study may explain the lack of attitudinal differences between the two minority groups. However, patient educational materials need to emphasize barriers to optimal pain management that are specific to minority groups. Our previous study of minority cancer patients found that the African-American and Hispanic patients were more likely than nonminority patients to report a need for stronger pain medication and the need to take more of their current analgesic medication than prescribed.[6] In the current study the majority of patients in both ethnic groups reported taking their pain medication on an "as needed" basis. This behavior suggests nonadherence to the physicians' prescribed analgesic regimens and a need for patient education concerning the importance of "around the clock" analgesic schedules.

The results of Study Two indicated that inadequate pain assessment, patient reluctance to report pain, inadequate staff knowledge regarding pain management, and medical staff reluctance to prescribe opiates were the top barriers to optimal pain management in the outpatient clinics. In addition, the health professionals' lack of time to attend to patients' pain was a major barrier that was not identified in the previous study of ECOG physicians in nonminority clinics.[7] The health care professionals in the current study were more willing than the ECOG physicians to prescribe a strong opioid (73% vs. 41%). This difference may reflect improvements in pain management practices in oncology settings during the time period from 1991–1997. The majority of the health care professionals reported a willingness to prescribe strong opioids for severe cancer pain using an "around the clock" regimen as recommended by the World Health Organization and the Agency for Health Care Policy and Research. Unfortunately, approximately half of the respondents would wait until a cancer patient had less than 6 months to live before prescribing maximum analgesia. The health care providers were more conservative in this regard than the ECOG physicians in the previous study. The providers also were more concerned regarding the possibility of addiction to opioid medication than the physicians in the previous study. In spite of this conservatism, the majority of the health care providers believed that their settings were doing a good or very good job of relieving cancer pain.

The results of Study Two suggest some recent improvements in training in cancer pain management for physicians and nurses. However, the survey results also indicate some content targets for education. Very few respondents considered the use of adjuvant medications. Although pain due to bone metastases often responds to adjuvant antiinflammatory medications, only 12% of the health care providers considered the use of antiinflammatory medications as part of their initial treatment regimen for the patient in the scenario. More information regarding opioid side effect management and the pharmacology of opioid analgesics also is needed. Nearly half of the health care providers did not know that constipation is the one side effect that typically does not decrease after repeated administration of opioids. In addition, many providers expressed concerns regarding side effects that limited their prescribing opioids. Other providers reported concerns about the development of rapid tolerance to opioids and the possibility of addiction. Thus, many health care professionals could benefit from additional education regarding the pharmacology of opioid medications.

The data indicate recent improvements in analgesic prescribing practices for African-American and Hispanic cancer patients with pain. Thirty percent of the patients were receiving inadequate analgesics given the severity of their pain, compared with 65% of minority cancer patients in our previous study.[6] Despite this improvement, a majority of the patients reported high levels of pain and less than optimal pain relief from analgesic medications. Inadequate dosages of pain medication or a lack of patient adherence to prescribed regimens may explain the patients' high pain intensity and limited pain relief. Although the health care providers in the current study recognized that poor pain assessment is a major barrier to optimal pain treatment, they underestimated pain severity in both ethnic groups. Patient education regarding pain management should focus on teaching patients how to communicate with health care providers regarding pain severity and pain interference. Educational interventions also need to emphasize the importance of adhering to regular medication schedules to achieve optimal pain control.

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# Appendix 2

## Abstracts:

Multi-Symptom Assessment in Minority Women with Breast Cancer

Use of Daily Postcard Diary to Assess Pain in Underserved Outpatients with Cancer-Related Symptoms

# MULTI-SYMPTOM ASSESSMENT IN MINORITY WOMEN WITH BREAST CANCER

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Our research has shown that minority women with breast cancer are at risk for under treatment of cancer-related pain. It is possible that minority cancer patients also are at risk for under treatment of other symptoms related to cancer or cancer treatment. The aim of the present study is to explore the frequency and intensity of multiple cancer-related symptoms in minority and non-minority breast cancer patients.

*Methods*: The subjects were African American, Hispanic, and Caucasian women with breast cancer who were receiving treatment in an oncology clinic at M.D. Anderson Cancer Center or LBJ General Hospital in Houston. The subjects were asked to complete the M.D. Anderson Symptom Inventory (MDASI) to measure the intensity of physical, affective, and cognitive symptoms related to cancer or cancer treatment. The MDASI also assesses symptom-related interference in general activity, walking, work, mood, relations with others, and enjoyment of life. Demographic and clinical data were collected..

*Results*: Our preliminary results indicate that symptoms with the highest mean intensities for the minority women are fatigue, sleep disturbance, worry, pain, not being able to get things done, and drowsiness. The symptoms with the highest intensities for the non-minority women are fatigue, not being able to get things done, worry, weakness, sleep disturbance, and emotional distress. The minority women reported significantly higher pain intensity ratings than the non-minority women, and their total symptom distress scores tended to be greater than those of the non-minority women. Across both groups of women, factors that were significantly associated with high levels of symptom distress were disease severity, current chemotherapy, and opioid medications. Women reporting severe or moderate pain had higher symptom distress levels than women with mild or no pain. Both groups of women reported considerable interference in their lives due to symptoms.

*Conclusions*: Our preliminary results suggest that minority women may experience higher pain levels and greater symptom distress than non-minority women. Additional subjects will be recruited to investigate further this possibility. Factors that are associated with symptom distress for minority and non-minority women are disease severity, chemotherapy, severe pain levels, and opioid medications.

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### (781) Use of A Daily Postcard Diary to Assess Pain in Underserved Outpatients with Cancer-Related Pain

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**Theme:**
#33 Pain assessment

Purpose:The successful management of pain requires communication between the patient and the health care provider.This communication can occur through the use of a pain diary. However, patient diaries may not be completed for various reasons such as excessive length or patient forgetfulness.With the underserved population, illiteracy or complicated instructions can prevent the successful completion of a pain diary.The purpose of this study is to test an alternative to the pain diary in underserved outpatients. Methods:As part of a pilot study on pain management education for the underserved, stamped postcards assessed the patient's worst and average pain ratings for the day and the number of times pain medications were taken. The postcards and instructions were given by the research nurse. Postcards and instructions in Spanish were also provided for the Spanish-speaking patients.A total of 14 postcards were issued to each patient.The patient was asked to complete a postcard on a daily basis and drop it in the mailbox on the following day. Each postcard was labeled with the day, date, and medications the patient was currently taking for pain control. Results: Preliminary results demonstrated a high compliance rate with the use of the postcard method of monitoring pain.A larger sample of underserved patients will be recruited to test whether the postcard method is a better alternative to the pain diary. Conclusion:The postcard method for monitoring daily pain levels appears to be a valuable assessment tool for underserved outpatients.

### (782) A Multidimensional Model Describing Factors that Influence Optimal Pain Management Outcomes in Persons with Acute and Chronic Pain

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**Theme:**
#33 Pain assessment

Pain is universal, multidimensional, and not adequately managed despite the availability of evidence based guidelines.The purpose of this study was to understand the pain experience in surveyed hospitalized patients and to determine if patient demographics, patients' knowledge, beliefs, and attitudes, and health care environment explain variance in patients' outcomes of pain intensity and satisfaction with pain management. Recognizing the complexities associated with optimal pain management, a multivariate structural equation model (SEM) was conceptualized, derived from research literature and this researcher's preliminary studies and experience, and tested using data from a heterogenous, random sample of hospitalized patients (n = 386) to identify and clarify the interrelationships of the theoretical constructs encompassing the pain experience. Patients completed a fifteen item survey developed by this researcher; a purposive sample of patients' caregivers, nurses, physicians, and family/significant others completed a two item scale rating the patient's pain and their satisfaction with pain management. Patients' medical records were audited for nurse/physician documentation of pain assessment.A medication quantification score was calculated for analgesic medications administered. Factor analysis, reliability (Theta = .7237), and validity testing of the University of Colorado Patient Pain Instrument (CUPPI) was accomplished. Data analysis using AMOS resulted in the inability to confirm or disconfim the SEM. Statistically significant findings from exploratory data analysis with corroboration of the literature informed the model respecification process.Analysis of a simplified, respecified model lend support to the viability of the model. Findings from multiple regression of the specific aims provided recommendations for future SEM pain research.While SEM did not yield desired results, contributions to the science of pain management were made. SEM is a useful methodology to identify salient variables and constructs leading to a comprehensive theory for understanding patients' pain expereince. Recommendations for future pain research using SEM will be presented.