Clinical Decision Making in Pain Management: Contributions of Physician and Patient Characteristics to Variations in Practice

Carmen R. Green,* John R. C. Wheeler,† and Frankie LaPorte*

Abstract: Differences in the quality of pain management may very well be due to physician characteristics and their treatment goals based on the type of pain or patient demographics. This study was done to (1) determine the role of physician characteristics in their goals and treatment of acute, cancer, and chronic pain and (2) provide an evaluation of the differences in physician pain management decision making due to patient characteristics and the type of pain being treated. A prospective cohort study of 368 Michigan physicians was done to determine their pain management knowledge, attitudes, and prescribing habits via study-specific multi-item mail survey. Nine clinical vignettes were used to examine potential differences in the physician’s pain management based on the type of pain and patient demographic characteristics. The responses of the study group varied on the basis of the type of pain and gender of the patient. They were more likely to provide optimal treatment for men with acute postoperative or cancer pain. The physicians also reported lesser goals for relief of chronic pain when compared to acute and cancer pain. Lower goals for chronic pain relief may lead to the undertreatment of chronic pain. This study demonstrates that the provision of adequate pain management may be influenced by patient characteristics and physician variability.

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Key words: Physician variability; pain management; patient characteristics; decision making; attitudes, knowledge, perceptions; barriers to treatment.

There is increasing appreciation among the public, healthcare providers, and scientific communities regarding the importance of adequate pain management.14,41 Much of the focus of pain management has been directed at the establishment of guidelines for the management of acute and cancer pain.1,3,12,13,17,43,67,68 Despite guidelines that have advocated for adequate cancer pain management, an estimated 500,000 patients will have cancer pain. Seventy percent of the patients who die of cancer will have unrelied cancer pain.26,29 Many other Americans will experience acute pain or suffer with chronic pain as a result of inadequate treatment based on knowledge deficits and misperceptions.78,38,72,74,75 Inadequacies in the management of pain and barriers to appropriate pain management persist despite the fact that pain is one of the most frequent reasons for which a patient consults a physician.26 Discussions regarding pain management outcomes have centered on the current state of the healthcare professional’s education, knowledge, and decision making regarding pain treatment.8,15,38,70-72 The importance of the adequate assessment and optimal management of pain has received a great deal of attention, as have the attitudes of healthcare professionals toward pain management.13,15,16,33,70,71 These factors have prompted several national organizations to call for the designation of pain as the “fifth vital sign.”60,65 To improve the assessment and management of pain, it is of critical importance to understand the physician characteristics associated with optimal pain management.

Although we might wish it otherwise, considerable variability has been noted in access to medical services.5,6,16 Differences have also been noted in the outcomes of therapeutic interventions, as well as surgical and medical treatment based on the patient’s race, ethnicity, age, gender, and socioeconomic status.2,5,6,19,24,27,44,47,61,77 Much of this literature has focused on cardiovascular, primary, and cancer care.18,23,25,27,30,32,42,44,47,49-51,54,61 However, the role of physician variability in access to pain treatment and management of pain has not been adequately addressed. In addition, minimal attention has been paid to the effect of the physician’s demographic profile on their care of patients with pain.16,71,72 To the best of our knowledge, no studies have evaluated the role of physician variability in the management of pain. Furthermore, studies directed at physician pain management knowledge have generally focused on only 1 type of pain.16,72 Other studies have focused on 1 group of physicians from a single discipline or those with presumed familiarity and knowl-
edge of pain management. The literature shows that physician and patient characteristics affect the adequacy of cancer pain management, whereas most studies of chronic and acute postoperative pain have not looked at how these physician or patient variables influence adequate pain management.

Differences in the quality of the management of acute pain, chronic pain, cancer pain, and the pain due to terminal illness may very well be due to physician characteristics as well as their goals for pain management. Patient demographic characteristics and the type of pain being treated may also contribute to differences in the management of all types of pain. These speculations led us to hypothesize that physician demographic characteristics also contribute to physician variability in pain management. Toward this end we designed a survey of Michigan physicians to examine the role of the physician variable (eg, age, ethnicity, gender), patient characteristics (eg, age, ethnicity, gender), and type of pain (eg, acute, chronic, cancer) on the physician’s decision making regarding pain. The aims of this study were to (1) describe approaches to pain management decision making by using a series of clinical vignettes, (2) compare the quality of pain management by the type of pain, (3) investigate differences in care by patient characteristics, and (4) identify the relationship between physician characteristics, their goals, and the quality of the pain management they provided as assessed by the vignettes.

### Material and Methods

#### Survey Instrument

The investigators developed a 4-page survey instrument to determine physician knowledge, attitudes, and prescribing habits for pain management. Faculty members in the Department of Anesthesiology and 14 University of Michigan physicians who provide outpatient care were enlisted to critique the survey instrument. Those questions that were ambiguous or lacked clarity were revised, and content areas that were overlooked were added to enhance the value of the questionnaire.

The Physician Pain Management Survey included 9 clinical vignettes developed by the investigators to examine the physician’s management of common clinical problems: acute, chronic, and cancer pain. Each vignette included pain symptoms for each type of pain and asked respondents to select a treatment option. To evaluate potential differences in pain management decision making by physicians on the basis of the patient’s gender or race, different clinical vignettes were developed and matched to evaluate each of these variables. Table 1 summarizes the patient demographic characteristics and types of pain reflected in the vignettes, and Table 2 demonstrates the factor structure of the vignettes. The 3 acute postoperative pain vignettes included pain after cesarean section (CS), myomectomy (MYO), and prostatectomy (PRO).

### Table 1. Summary of Pain Vignettes, Distribution of Responses by the Type of Pain and Summary Statistics

<table>
<thead>
<tr>
<th>VIGNETTE RESPONSE, N (%)</th>
<th>SUMMARY STATISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN ± SD</td>
</tr>
<tr>
<td><strong>WORST</strong></td>
<td><strong>POOR</strong></td>
</tr>
<tr>
<td>Prostatectomy* (44/M)</td>
<td>28 (8.3)</td>
</tr>
<tr>
<td>Cesarean section* (24/F)</td>
<td>9 (2.7)</td>
</tr>
<tr>
<td>Joint pain due to sickle cell anemia†,§ (24/F)</td>
<td>37 (11.0)</td>
</tr>
<tr>
<td>Joint pain due to rheumatoid arthritis†,§ (35/F)</td>
<td>9 (2.6)</td>
</tr>
<tr>
<td>Low back pain due to chronic pain‡ (68/M)</td>
<td>16 (4.9)</td>
</tr>
<tr>
<td>Low back pain due to arachnoiditis‡ (74/F)</td>
<td>10 (2.9)</td>
</tr>
<tr>
<td>Generalized and bone pain due to prostate cancer with bone metastasis§ (54/M)</td>
<td>18 (5.5)</td>
</tr>
<tr>
<td>Generalized and bone pain due to breast cancer with bone metastasis§ (57/F)</td>
<td>1 (0.3)</td>
</tr>
</tbody>
</table>

Gender equivalent pain problems by type of pain: *acute postoperative pain.

NOTE. 1, optimal response; 5, worst response.

Gender equivalent pain problems by type of pain: †chronic pain.

‡Race assumed to be black due to its prevalence in African Americans.

§Age equivalent chronic pain problems.

Gender equivalent pain problems by type of pain: §cancer pain.
tectomy (PRO). Pain due to sickle cell anemia (SCA), rheumatoid arthritis (RA), arachnoiditis (ARC), and degenerative joint disease (DJD) were the 4 chronic pain management vignettes. The 2 cancer pain management vignettes were metastatic breast (MB) and prostate (MP) cancer. Gender equivalents for acute pain were MYO and PRO. Chronic pain gender equivalents were ARC and DJD, and cancer pain gender equivalents included MB and MP. Two matches for chronic pain were included as 4 chronic conditions: (1) SCA and RA and (2) ARC and DJD. SCA and RA were considered to be ethnic equivalent chronic pain problems because both involve joint pain, but SCA has a predisposition in blacks. Age equivalent chronic pain problems were ARC (in a 74-year-old woman) and RA (in a 35-year-old woman).

Identical treatment options for the matched vignettes were developed by the principal investigator and were provided to the participants in a multiple choice best answer format. A choice of “refer to a pain management specialist” was included. Other treatment options included (1) a clear improvement in the analgesic regimen (ie, optimal), (2) a slight improvement in the analgesic regimen (ie, fair), (3) no improvement in the analgesic regimen (ie, poor), and (4) an analgesic regimen that was worse than the current regimen (ie, optimal). Pain management fellows and attending pain management physicians at the University of Michigan Health System (UMHS) were asked to grade the treatment options for the vignettes, ie, age, ethnicity, education, gender, prescribing frequency, treating frequency, and goals for pain relief by type of pain.

**Survey Distribution and Study Subjects**

The UMHS Institutional Review Board granted approval of this study. Randomly selected licensed Michigan physicians who provided clinical care were included in the sample frame. Eligible Michigan physicians (n = 1773) were mailed the survey and an accompanying cover letter encouraging their participation. Survey distribution included 3 mailings of the survey with return US postage paid envelopes and reminder postcards during a 2-month period. No incentives were offered for participation. An abbreviated nonresponder questionnaire was sent to determine reasons for nonparticipation.

**Data Analysis**

All data analysis was performed with the SPSS/PC+ statistical package (SPSS, Inc, Chicago, IL). Descriptive statistics were used to characterize the study group. The Student t-test and confidence intervals were used to evaluate physician education, goals, and attitudes. Analysis of variance (ANOVA) was used to characterize the relationship between the attitudes and frequency of prescribing opioids by type of practice, ie, specialty or primary care.

Principal components analysis and factor analysis with varimax rotation were done to determine whether the physician’s vignette responses were comparable within the same type of pain (Table 2). Pearson’s correlations and kappa statistics were computed to compare agreement between responses or vignettes that differed in the patient’s race, gender, or age as well as type of pain. McNemar’s test was used to evaluate the proportion of optimal versus worst treatment choices in each pair of vignettes because each respondent provided an answer for each vignette. When it was appropriate to control for a Type I error, Bonferroni corrections and 2 degrees of freedom were used to account for physician responses to the vignettes, ie, age, ethnicity, education, gender, prescribing frequency, treating frequency, and goals for pain relief by type of pain.

<table>
<thead>
<tr>
<th>VIGNETTE</th>
<th>FACTOR 1</th>
<th>FACTOR 2</th>
<th>FACTOR 3</th>
<th>FACTOR 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sickle cell anemia</td>
<td>.05784</td>
<td>.74237</td>
<td>.26372</td>
<td>−.01015</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>−.09531</td>
<td>.18758</td>
<td>−.00926</td>
<td>.80548</td>
</tr>
<tr>
<td>Arachnoiditis</td>
<td>−.07083</td>
<td>.12331</td>
<td>.81090</td>
<td>−.13166</td>
</tr>
<tr>
<td>Myomectomy</td>
<td>.81334</td>
<td>.08069</td>
<td>.01884</td>
<td>−.05077</td>
</tr>
<tr>
<td>Cesarean section</td>
<td>.82142</td>
<td>−.00928</td>
<td>.02486</td>
<td>.05839</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>.05803</td>
<td>.84437</td>
<td>.02429</td>
<td>.04378</td>
</tr>
<tr>
<td>Degenerative joint disease</td>
<td>.06124</td>
<td>.12836</td>
<td>.78401</td>
<td>.18418</td>
</tr>
<tr>
<td>Prostatectomy</td>
<td>.79826</td>
<td>.05758</td>
<td>−.04993</td>
<td>.08676</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>.17926</td>
<td>−.14844</td>
<td>.05130</td>
<td>.77107</td>
</tr>
<tr>
<td>Type of pain (variable tested)</td>
<td>Acute</td>
<td>Chronic</td>
<td>Chronic</td>
<td>Cancer</td>
</tr>
</tbody>
</table>

### Table 2. Results of Factor Analysis
freedom were used. When comparing the results of McNemar’s tests, each 5 by 5 contingency table was collapsed into three 2 by 2 contingency tables for comparisons. Stepwise linear and logistic regression models were used to determine whether the variables of age, race, ethnicity, gender, education, frequency of treatment, frequency of prescription, or physician attitudes could predict their treatment responses for the clinical vignette presented.

Results

Seven of the 1553 questionnaires that were successfully delivered were excluded because the physicians did not provide clinical care. Complete responses were obtained from 368 Michigan physicians. The final sample consisted of 63% primary care (n = 292) and 36% specialty physicians (n = 72) based on the clinical care provided and whether a referral is typically required. The response rate for completion of the entire survey was 24%. Analysis of the 72 responses obtained from the abbreviated nonresponder questionnaire (8%) showed no substantive differences by age, race, or practice. They reported that time constraints prevented their participation. The majority of the respondents were white, and their average age was 45 ± 13 years (mean ± standard deviation [SD]). Table 3 illustrates the characteristics of the physician nonrespondents and characteristics of other Michigan physicians as provided by the American Medical Association.56,58

Physician Goals for Pain Management

As shown in Table 4, more than 75% of the physicians identified their goals for pain relief as absolute or complete or adequate pain relief without distress regardless of the type of pain. For terminally ill patients, nearly 40% of the physicians reported a goal of absolute and complete pain relief, and nearly 25% of the physicians reported this goal for patients with cancer. Only 5% of the physicians reported a goal of complete pain relief for chronic pain. A shift in the physicians’ goals for chronic pain was statistically significant (P = .05) when compared to other types of pain.

Physician Management of Clinical Scenarios by Patient Characteristics

Table 1 also summarizes the responses to the clinical scenarios and confidence intervals. Respondent physicians were most likely to choose optimal treatment for acute pain after PRO (56.2%). They were also most likely to prescribe the worst treatment option for acute pain after CS. Figs 1, 2, and 3 provide an illustration of the distribution of physician responses to the acute, chronic, and cancer pain vignettes and statistically significant differences when the responses are collapsed into 3 categories. Table 2 provides factor analysis data for each vignette. The minimal variability in the factor analysis data suggests that the vignettes were consistent across the different types of pain and the variables of interest were being measured, ie, age, ethnicity, gender (Table 2).

<table>
<thead>
<tr>
<th>Table 3. Race, Gender, and Age Distribution of Physician Study Population, Nonresponders, and AMA Statistics of Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>% Male</td>
</tr>
<tr>
<td>% Female</td>
</tr>
<tr>
<td>Race</td>
</tr>
<tr>
<td>% White</td>
</tr>
<tr>
<td>% Black</td>
</tr>
<tr>
<td>% Hispanic/Latino</td>
</tr>
<tr>
<td>% Asian/Pacific Islander</td>
</tr>
<tr>
<td>% Other</td>
</tr>
<tr>
<td>Mean age (±SD)</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Practice type</td>
</tr>
<tr>
<td>% Specialty</td>
</tr>
<tr>
<td>% Primary care</td>
</tr>
</tbody>
</table>

Abbreviations: AMA, American Medical Association; SD, standard deviation; NA, not applicable.

*Data not available from AMA.

Gender

Analysis of the ARC (in a woman) and DJD (in a man) chronic pain vignettes showed that 11.5% of the respondent physicians chose the optimal treatment option for the woman, whereas only 7.1% did so for the man. The paired surgical procedures resulting in acute postoperative pain, MYO (in a woman) and PRO (in a man), indicated that the man was significantly (P < .001) more likely to receive fair or optimal treatment (74% vs 51.1%) and the woman was more likely to receive poor or the worst treatment (46% vs 20.7%). Evaluation of the confidence intervals (CIs) for management of MB cancer 2.4 (95% CI, 2.3 to 2.5) showed a positive shift for the man (Table 1). For cancer pain (MP in a man and MB in a woman), the man was significantly (P = .011) more likely to receive optimal treatment or referral (81.4% vs 59.2%) and the woman more likely to receive poor or the worst treatment option (7.8% vs 1.8%). Notable differences were found in the referral rates. The pain due to MP cancer was more likely to generate a referral to a specialist for treatment than was pain due to MB cancer (65% vs 49%; P = .001). Evaluation of the CIs for management of MB cancer 2.4 (95% CI, 2.3 to 2.5) and MP cancer 2.0 (95% CI, 2.0 to 2.1) showed significant differences (P < .05).

Ethnicity

The paired vignettes describing SCA (presumably in a black woman) and RA (in a white woman) were used to test for the association of the patient’s ethnicity and the
physician’s management of pain. There did not appear to be any substantive differences in the quality of the physician’s treatment decisions between SCA 2.8 (95% CI, 2.7 to 2.9) and RA 3.0 (95% CI, 2.9 to 3.1).

**Age**

The paired vignettes describing ARC (in a 74-year-old woman) and RA (in a 35-year-old woman) were used to test for an association of the patient’s age and the physician’s management of pain. Cross tab analysis of these 2 vignettes demonstrated notable differences in the physicians’ choice of treatment ($P < .0005$). Specifically, the RA patient received a higher percentage of poor or worse answers. Physicians chose to generate a referral for pain due to ARC more than for pain due to RA (70% vs 46%).

**Physician Characteristics**

Physicians were grouped by how well they responded to the clinical vignettes. Physician variables were classified into 5 categories: (1) physician demographic characteristics, (2) attitudes, (3) knowledge, (4) pain management, and (5) frequency of treating and prescribing for different types of pain (never to very often).

With stepwise linear regression analysis, only a few physician characteristics were found to predict how well the physicians responded to the vignettes. Physician goals for pain relief was the best predictor overall for how well the primary care physicians responded to all of the vignettes, ie, acute, chronic, and cancer pain ($R^2 = .41; P = .048$). The best predictor for acute pain was the frequency of treating acute postoperative pain. For chronic pain, the frequency of prescribing triplicate drugs was found to be the best predictor. Table 5 shows other physician characteristics that predicted the best responses to the clinical vignettes. A summary of the physician’s opinions (1, strongly disagree; 5, strongly agree) that were independent of the type of pain is shown in Table 6. Overall they tended to agree that a person’s ethnicity or culture affected their ability to deal with pain 3.7 (95% CI, 3.6 to 3.7) but were neutral on the impact of gender on an individual’s ability to deal with pain 3.1 (95% CI, 3.0 to 3.2). Physicians tended to disagree that good patients avoid talking about pain 1.7 (95% CI, 1.6 to 1.8) and that pain medicine should be saved in case the pain gets worse 2.0 (95% CI, 1.9 to 2.0).

**Discussion**

This article has presented 3 related sets of results regarding the approach to pain management taken by practicing physicians. Most basically, we looked at physicians’ goals for the management of pain associated with acute and chronic conditions, cancer, and terminal illness. Through the use of clinical vignettes, we investigated the manner in which physicians tend to treat
acute, chronic, and cancer pain of specific origin. The vignettes permit some consideration of whether physicians’ treatment approaches are related to patient gender, ethnicity, and age. Finally, we presented some findings on the characteristics of physicians most likely to prescribe the best approach to the management of pain. Taken together these results allow us to draw some conclusions about the state of pain management while stimulating important questions meriting further consideration in the future.

Considering the significant socioeconomic and personal implications of pain, the adequate management of pain is of critical importance. Identification of physician variables that contribute to inadequate pain management may allow for strategies specifically designed to optimize pain management. For all of the vignettes a large part (greater than 40%) of the average vignette score could be attributed to primary care physicians’ goals for pain relief and their prescribing frequency. The limited predictors for acute pain as well as the absence of common predictors for cancer and chronic pain among the 2 groups of physicians supports physician variability in the management of pain (Table 5). Although this survey study was done in Michigan, these results can potentially be extrapolated to physicians practicing in other states.

Discrepancies were noted in the physician goals for pain relief based on the type of pain (Table 4). Our data show lower pain relief goals for chronic pain than for other types of pain. Understanding these dramatic differences in pain relief goals by type of pain is essential. We surmised that not only physician attitudes but also their demographics could contribute to their goals for pain management. This study of physicians did not include enough ethnic minorities or women to detect the potential impact of the physician’s ethnicity or gender on the pain care they provided. In retrospect, to provide worthwhile answers regarding the impact of physician demographic variables on pain management, future studies may require oversampling of women and ethnic minority physicians.

Clinical vignettes were used in this study to determine the physician’s management of different types of pain and to prevent a presentation bias. However, vignettes may not represent real world clinical scenarios because they lack details regarding the patient’s insurance, medical history, social history, and socioeconomic status. The patient’s perspective of the adequacy of their pain management or their response to treatment was also not addressed in this study. Real world case management is much more challenging, and patients are much more complicated than vignettes. However, vignettes do provide valuable insights into decision making.

Overall, the physicians provided optimal management for cancer and acute pain. They reported more experience with acute pain but had the highest percentage of worst responses for the management of acute pain after CS. It is unclear whether their responses were modified by the potential interaction of a breast-feeding mother. Nonetheless, the management of acute postoperative pain after PRO had a higher percentage of correct answers and the highest percentage overall. This was consistent with a higher percentage of referral of MP cancer to a pain management specialist.

Our data indicate that the physicians agree that good patients should talk about their pain concerns. We also

Table 5. Results of Stepwise Linear Regression: Physician Characteristics that Predict Better Response to Clinical Vignettes

<table>
<thead>
<tr>
<th>TYPE OF PHYSICIAN</th>
<th>TYPE OF PAIN</th>
<th>PREDICTOR</th>
<th>R²</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary care physicians</td>
<td>Acute</td>
<td>Frequency of treating acute post operative pain</td>
<td>.41</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Cancer</td>
<td>None</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Chronic</td>
<td>Frequency of prescribing triplicate drugs</td>
<td>.45</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>All vignettes</td>
<td>Goals for pain relief</td>
<td>.41</td>
<td>.048</td>
<td></td>
</tr>
<tr>
<td>Frequency of treating acute post operative pain</td>
<td>.45</td>
<td>.037</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty physicians</td>
<td>Acute</td>
<td>Education</td>
<td>.22</td>
<td>.047</td>
</tr>
<tr>
<td>Cancer</td>
<td>None</td>
<td>Frequency of treating acute post operative pain</td>
<td>.22</td>
<td>.021</td>
</tr>
<tr>
<td>Chronic</td>
<td>None</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>All vignettes</td>
<td>None</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
found that the physicians were neutral in their belief that complaints of pain were distracting. These findings suggest that patients should be more forthcoming about their pain complaints. The physicians supported the use of nonpharmacologic methods for pain management and the importance of the role of cultural or ethnic factors that may influence an individual’s ability to deal with pain. Physician prescribing frequency appears to be associated with the best management of acute pain. The finding that pain education was only associated with the best acute pain management among specialty physicians was surprising (Table 5). It was also surprising to find that although the physicians reported an increased frequency of treating chronic pain, overall they also chose a lower percentage of optimal treatment strategies for its management. This is counterintuitive to the generally accepted notion that increased experience yields increased proficiency. Thus it follows that educational efforts alone may not be sufficient to increase proficiency, which may reflect inherent complexities in the complex nature of these patients.

Link and Zabar48 and Lurie et al49 discussed the influence of physician gender on the provision of routine health screening. Comparing responses to the sets of paired vignettes for differences in treatment of pain by the patient’s age, ethnicity, and gender yielded several interesting patterns. The physicians were neutral in their belief of whether a patient’s gender affected their ability to deal with pain. In fact, on evaluation of the chronic pain scenarios, the physicians had a higher percentage of optimal responses for the woman with ARC than for the man with DJD. However, it was interesting to note that they referred the man with DJD more frequently than the woman with ARC to a pain management specialist. Further analysis of these 2 cases showed that the physician’s choice of pain management might very well have been influenced by the patient’s gender, suggesting that a patient’s gender plays a role in the adequacy of chronic pain management. Similar results were found for cancer pain management. Although we did not find that the physician’s cancer pain decision making was influenced by the patient’s gender, the physicians more frequently referred the man with MP cancer than the women with MB cancer for pain management. The reasons for these findings are unclear but emphasize the importance of further study to elucidate the causes for these differences.

The literature supports that differences in the provision and outcomes of healthcare may be influenced by the patient’s age, ethnicity, and gender.2,9,27,42,44,45,51 Schulman et al61 used a series of videos and actors to look at potential differences based on patient demographics and found that a patient’s race and gender independently influenced how physicians managed chest pain. In this study, the physicians endorsed that ethnicity and culture affected an individual’s ability to deal with pain. However, the physicians in this study frequently tended to refer patients with RA and SCA to pain specialists, but no differences were seen in their management. Although we did not find treatment differences based on ethnicity in this study, others have.10,22,44,47,61,69 Refinement of our tool and more study are required to evaluate whether a patient’s ethnicity has an influence on how physicians manage pain.

Three mail follow-ups were used in this anonymous survey of physicians.4,20,21 Monetary incentives were not used because they may introduce a selection bias.62 Overall, we believe that the total number of respondents to this survey was substantial for a group of busy physicians from multiple disciplines.4 Furthermore, analysis of the demographic data of the respondents did not show significant differences from other surveys of Michigan physicians.58 The small number of women and ethnic minority physicians prevents analysis of any potential pain treatment differences that could be attributed to physician gender or ethnicity. It is possible, however, that our findings could be biased by an over-representation of respondents who were more knowledgeable about pain management, thereby yielding a more positive interpretation of our results than what is currently real world practice.

In conclusion, this study serves as a platform for future
outcome studies on physician characteristics that contribute to the management of different types of pain. New expectations from the Joint Commission on Accreditation of Healthcare Organizations have been developed to ensure the adequate assessment and treatment of all types of pain. Yet, we have shown the consistent undertreatment of chronic pain, as well as lower goals for its relief. In this study in which few characteristics were found to be predictive of best practice, physician variability was seen for all types of pain management. Despite discrepancies in their stated goals and management of different types of pain (especially chronic pain), the physicians universally expressed a desire for patients to tell them of their pain management concerns. Our findings suggest the need for continuing study of the relationship between physician variability and patient characteristics as important influences on the adequacy of the management of pain, especially as it relates to chronic pain management.

Acknowledgments

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Appendix

From “The Physician Pain Management Survey” vignettes:

1. A 24-year-old female with sickle cell anemia presents to clinic with joint pain. In the past, she used hydrocodone with variable control of her pain. She reports that her pain intensity is severe. She now complains of increasing chronic pain. The most appropriate regimen for her chronic pain would be:
   a. Start chronic opioid therapy with methadone or oral morphine
   b. Continue her current regimen and add tramadol for breakthrough pain
   c. Place her on oxycodone
   d. Use acetaminophen with codeine
   e. Refer to pain management specialist

2. A 54-year-old male with metastatic prostate cancer complains of bone and generalized pain. His life expectancy is no more than 6 months. No new surgical procedures are planned. He reports severe pain despite a morphine PCA [patient-controlled analgesia] at 20 mg/hr with a bolus of 5 mg available every 6 minutes. He obtains some additional relief with 75 mg IV [intravenous] meperidine q [every] 6 hours prn [as required]. On physical examination he is drowsy, but awakens easily. He appears uncomfortable and is in moderate acute distress. Prior to his admission, he reported extreme pain despite oxycodone at 120 mg po [by mouth] bid [twice a day] with hydromorphone 6 mg po q 4-6 hours prn for breakthrough pain. The most appropriate management of his pain would be:
   a. Discharge him home on his previous home regimen
   b. Add oxycodone and acetaminophen to his home regimen
   c. Consider an IV home PCA
   d. Consider a trial of intrathecal opioids
   e. Refer to pain management specialist

3. A 74-year-old female presents to clinic with chronic low back pain due to arachnoiditis. She has used hydrocodone with minimal relief of her pain. Her quality of life has decreased and she reports severe pain...
daily. She received no relief from epidural steroids. The most appropriate management would be:
   a. Start methadone or oral morphine for chronic opioid therapy
   b. Administer tramadol for breakthrough pain
   c. Start oxycodone with acetaminophen
   d. Repeat caudal epidural steroids
   e. Refer to pain management specialist

4. A 44-year-old female complains of incisional pain following a myomectomy. The most appropriate management for her acute postoperative pain would be:
   a. Acetaminophen hydrocodone
   b. Start intravenous PCA
   c. Ibuprofen
   d. Management with an epidural for postoperative pain
   e. Refer to pain management specialist

5. A 24-year-old female complains of incisional pain immediately following a cesarean section. She denies a prior history of pain. The most appropriate management would be:
   a. Acetaminophen with codeine
   b. Hydrocodone
   c. Ibuprofen
   d. Start an IV PCA
   e. Refer to pain management specialist

6. A 35-year-old female with severe rheumatoid arthritis presents to clinic with chronic pain. In the past, her pain had been controlled with hydrocodone. She now complains of constant and increasingly severe pain. The most appropriate management for her chronic pain would be:
   a. Start chronic opioid therapy with methadone or oral morphine
   b. Continue her current regimen and add tramadol for breakthrough pain
   c. Place her on oxycodone
   d. Use acetaminophen with codeine
   e. Refer to pain management specialist

7. A 68-year-old male presents with severe pain due to degenerative joint disease and low back pain. Nerve blocks have not been helpful for his pain. The most appropriate management for his pain would be:
   a. Start methadone or oral morphine for chronic opioid therapy
   b. Administer tramadol for breakthrough pain
   c. Start oxycodone with acetaminophen
   d. Repeat caudal epidural steroids
   e. Refer to pain management specialist

8. A 44-year-old male complains of incisional pain immediately following radical retropubic prostatectomy. The most appropriate regimen for his acute postoperative pain would be:
   a. Acetaminophen with hydrocodone
   b. Start an intravenous PCA
   c. Ibuprofen
   d. Management with an epidural for postoperative pain
   e. Refer to pain management specialist

9. A 57-year-old female with breast cancer with metastases to the bone is currently on a hydromorphone PCA. She complains of generalized and back pain. Her life expectancy is 3 to 6 months. She receives 2 mg of hydromorphone an hour continuously and has the ability to bolus herself with 0.5 mg of hydromorphone every 6 minutes. She occasionally requires 10 mg IV boluses of morphine q 4 to 6 hours prn. Physical examination reveals an alert female in acute distress. Prior to her hospitalization for intractable pain, she utilized a fentanyl patch at 150 μg/hr and hydromorphone 6 mg po q 4 to 6 hours prn for breakthrough pain. It is her desire to return home with a visiting nurse. An appropriate home regimen would be:
   a. Discharge her home on her previous home regimen
   b. Add oxycodone and acetaminophen to her home regimen
   c. Consider an IV home PCA
   d. Consider a trial of intrathecal opioids
   e. Refer to pain management specialist

### Table A1.

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NOTE: Pairs: 1 and 6, females with chronic pain; 2 and 9, male and female with cancer pain; 3 and 7, female and male with chronic low back pain; 4 and 8, female and male with acute postoperative pain.

Singleton: 5, female acute pain following cesarean section.