Management of Pain in Terminally Ill Patients: Physician Reports of Knowledge, Attitudes, and Behavior

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Abstract

Physician knowledge, attitudes, and reported prescribing behaviors toward pain management in terminally ill patients was surveyed among primary care physicians (PCPs) and oncologists in a southern urban county. Response rates were 64% for PCPs and 100% for oncologists. The effects of knowledge and attitudes on reported behavior were analyzed after accounting for physician demographics, training, and experiences.

Oncologists' knowledge and attitudes were close to ideal and behaviors less so. PCPs' knowledge was worse than oncologists, and attitudes and behaviors were even less optimal. Reported behaviors among PCPs correlated somewhat with attitudes, less with background factors, and rarely with knowledge.

In multivariate analysis, demographic and experiential factors explained more of selected behaviors than attitudes or knowledge. However, all variables combined left the majority of variation in behaviors unexplained. Physician continuing education will not effect significant behavioral changes in the care of terminally ill patients solely by the traditional approach of attempting to modify knowledge and attitudes. J Pain Symptom Manage 1998;15:27–40. © U.S. Cancer Pain Relief Committee, 1998.

Key Words
Terminal care; palliative care trends; medical education; knowledge, attitudes, practice; attitudes of health personnel

Introduction

The problem of undertreated cancer pain remains one of the most frustrating and persistent challenges to the medical profession.

Beginning more than 20 years ago, undertreatment of pain has been identified, analyzed, editorialized, and lamented.1-12 Enormous resources and much attention in the form of the World Health Organization Cancer Pain Relief Program,13-15 the U.S. Department of Health and Human Services Clinical Practice Guidelines on Cancer Pain Management,16 State Cancer Pain Initiatives,17,18 numerous Continuing Medical Education programs, and volumes of excellent educational materials19-28
have focused on this very topic. And yet, the question remains: “Why are our patients still in pain?”

In an attempt to answer this question, multiple surveys of physicians have explored the discrepancy between medical knowledge and physician practices with a variety of definitions and methodologies. Surveys have examined physician knowledge, attitudes, and reported behaviors relating to cancer pain management using multiple choice or open-ended questions, patient scenarios, and Likert-scale attitudinal questions. Although differences in methodologies make comparisons difficult, some commonalities and trends emerge.

A chronological review of the results reveals much progress in the form of increased physician knowledge and more appropriate attitudes, but frustratingly small improvements in actual practice. The now famous study by Marks and Sachar was the first to document undertreatment of cancer pain. Seventy-three percent of medical inpatients in their institution reported severe to moderate distress despite being placed on an analgesic regimen. Meperidine (Demerol®), given “as needed,” was the most frequent analgesic ordered. A questionnaire assessing attitudes concerning, and knowledge of, the pharmacology of opioid analgesics was administered to 102 house staff physicians. The stated goal of most respondents was to alleviate the patient’s pain to the point where they experienced “no distress.” However, most physicians underestimated analgesic doses, overestimated dosage intervals, and harbored unfounded fears of the addictive potential of these agents. In a prophetic statement, the authors predicted that the undertreatment documented was more complex than simple deficiencies in knowledge. They stated that “…for many physicians these drugs have a special emotional significance that interferes with their rational use” (p. 181) and that any educational intervention would have to take this into account.

Three subsequent studies have surveyed medical students and house officers regarding pain management. In 1978, Charap’s survey of surgery and oncology housestaff showed a profound lack of knowledge of basic opioid pharmacology and gross overestimation of the risks of addiction to opioids. In addition, respondents thought that most patients were overmedicated. Although meperidine was still the favored opioid, morphine usage was increasing. Respondents stated that the majority of their analgesic knowledge was acquired at the bedside, and most were content with their own perceived level of knowledge. Charap was also one of the first authors to identify and describe the basic morphine “myths” that since have been repeatedly discussed in the literature. Grossman and Sheidler addressed the ability of medical students and house officers to calculate the equianalgesic doses of various opioids. Only 8% of answers were within the acceptable range even though appropriate references were supplied. In a third study, first-year medical students in Wisconsin displayed many negative attitudes towards cancer pain, indicating the need for deliberate educational efforts in this area.

Several studies have examined the most recent state of knowledge, attitudes and some behaviors of practicing physicians in regards to cancer pain management. In 1986, Cleeland et al. surveyed physician members of a statewide oncology research and continuing education group. Using cluster analysis, they were able to identify two subtypes of physician behavior regarding pain management practices. The more “liberal” Cluster I physicians were younger and had more specialized oncology experience than their more “conservative” Cluster II colleagues. Cluster I physicians were more likely to believe that patients were undermedicated for pain, to give patients more control over their analgesic regimens, to use analgesics “around the clock” instead of “as needed,” to use adjunctive therapies, and to prefer potent oral opioids.

Four recent studies, although using varied methodologies, show some positive trends in U.S. physician knowledge and attitudes towards cancer pain management while highlighting areas that are still problematic. In the only study to ask this question directly, Elliott and Elliott found that only 10% of primary care physicians still did not recognize morphine as the opioid of choice for cancer pain. This is in marked contrast to earlier reports of almost universal use of meperidine. In two of these studies, a vast majority of respondents (76% and 86%, respectively) agreed that most patients were undermedicated for cancer pain. In addition, fear of
addiction had decreased and ranged from 2% of oncology specialists\(^3\) to 24%-25% of primary care physicians;\(^4\) this change followed the demonstration that addiction to opioids rarely occurs in the medical setting.\(^5\) In a recent multi-site telephone study by Elliott et al.,\(^6\) physicians showed desirable attitudes on seven of nine items. However, 17%-3% to 51%-8\(^4\) of physicians continue to believe that drug tolerance, instead of worsening pathology, is the reason for patients requesting more analgesic.

On average, one-quarter to one-third of physicians\(^4\) still link use of strong analgesics to prognosis and only 11%-use adjuvants as often as recommended in the literature.\(^5\) Thirty-nine percent\(^4\) to 65%-8\(^5\) agree that managing medication side effects is most difficult for them, but few use prophylactic measures to prevent side effects. Most physicians report that they base their pain management on previous experience, yet few report specific training in this area and many are not satisfied with that training.\(^3,5,8\)

In this physician survey, administered just prior to the publication of the U.S. Department of Health and Human Services Clinical Practice Guidelines for Cancer Pain Management in 1993, we focused on primary care physicians in an urban county in North Carolina. Our joint experience and a focused chart review performed at our hospice identified problems in pain management in homebound terminally ill patients. We noted non-oncology physicians to be reluctant to use sufficient doses and appropriate routes of administration for opioids; to fail to add indicated adjuvant medications and to anticipate and treat common side effects; and to overuse meperidine.

The studies we reviewed explicitly\(^3,6\) or implicitly assumed that physicians’ behavior in the management of cancer pain is primarily a function of their knowledge and attitudes. As this assumption guides efforts to improve such behaviors, educational interventions have been targeted at individual physician’s knowledge and attitudes. In our review of the literature, we have found no analysis to test this fundamental assumption. Our main purpose here is to do so.

Many social psychologists continue to organize their research around the hypothesis that behavior follows consistently from attitudes\(^8\) despite decades of findings to the contrary.\(^4\)

The widespread and longstanding belief in attitude-behavior consistency rests first on the conception of attitudes as stable predispositions and second on the value placed on consistency between attitudes and behavior, at least in Western culture.\(^1\)\(^2\) Explanations for the failure to demonstrate consistency between attitudes and behavior emphasize important non-attitudinal factors. These include habits, experiences, motivations, social norms, and the expectations of others, especially those in the immediate social context.\(^3,5,12\) For example, in the field of prescription drugs, physicians report that they prescribe according to their residency training and their perceptions of how their peers prescribe.\(^4,8\) In light of social psychological research, we do not expect to find a regular pattern of consistency between attitudes favorable to alleviating chronic pain and behavior to achieve that end. We are, therefore, not oriented primarily toward changing chronic pain and behavior to achieve that end. We are, therefore, not oriented primarily toward changing attitudes as the way to change pain management behaviors. Instead, we pay special attention to knowledge of relevant information and the social context of behavior change efforts.

Our objectives were as follows:

1. To describe the knowledge, attitudes, and reported behaviors of a well-defined primary care physician population as they relate to the treatment of pain in the terminally ill patient.
2. To compare the knowledge, attitudes and reported behaviors of the local practicing oncologists, as the community standard, with those of the primary care physicians.
3. To identify specific areas for educational intervention among the primary care physicians.
4. To analyze the effect of pain management knowledge and attitude on reported behavior after taking account of physicians’ demographic, medical training, medical practice, and personal experience characteristics.

We hypothesized that the oncologists’ scores on the survey would be appropriately high and would therefore be the desired community standard. We believed we could then identify specific areas in which the primary care physi-
cians, divided by specialty groupings, substantially differed from the oncologists, thus enabling us to better target our educational efforts. We did not anticipate a strong direct effect of attitudes on reported behavior.

**Methods**

**Survey Procedure**

A 69-item survey assessing physician knowledge, attitudes, and stated behaviors in managing pain in terminally ill patients was developed and distributed in 1993 to all oncologists and primary care physicians in a southern urban county. A sociologist consulted on questionnaire development, survey administration, and analysis. The questionnaire was pretested on 18 primary care physicians and three oncologists who resided outside the study area. The consistency of items to be indexed was examined statistically and plans for indices were revised accordingly. Two additional physicians were interviewed in person using the survey instrument to identify problematic questions and wording. Typical time to complete the questionnaire ranged from 10 to 15 min. After pretesting, the questionnaire was substantially revised.

Next, the 11 practicing oncologists in the study county were surveyed using the revised questionnaire. A personalized letter was sent with the questionnaire and the majority were hand-delivered with a personal explanation. Eight were returned shortly, one after a follow-up letter, and the last two after phone call prompts for a response rate of 100%. One problematic question was rewritten.

The slightly revised questionnaire was then sent to all 310 primary care physicians in the study county. The mailing list was compiled from the mailing lists of the local hospice and the county medical society and the yellow pages of the telephone book. Physicians in the ten subspecialties that have contact in our community with terminally ill patients requiring pain management were surveyed. They were general surgeons, urologists and otolaryngologists; internists, gastroenterologists, pulmonologists and infectious disease specialists; family practitioners; gynecologists; and neurologists. Survey administration followed the Total Design Method with special attention to the problems of surveying physicians. Anonymity was guaranteed through use of a numbered coding system. A personalized letter accompanied each questionnaire and the initial mailing was timed for optimal receipt that avoided weekend and holiday rush. Reminder postcards and additional copies of the questionnaire were sent on a predetermined schedule. Physicians were offered the option of responding to the survey in written form or giving their responses by telephone at a time of their choosing; only one physician chose the phone option. All but two completed questionnaires were received within 2 1/2 months of the initial mailing.

**Response Rate**

Response rate was 100% for oncologists and 64% for primary care physicians. Response rate did not vary substantially by specialty (see Table 1). Distribution of respondents did not vary substantially from the total survey population by specialty type, gender (15.8% female for population and 15.6% for respondents), or percent in private practice (87.1% for population and 85.4% for respondents).

Data collection for the oncologists included more personal contact than for the PCPs. This may have increased the oncologists' response rate, but we have no reason to think it influenced their answers.

**Questionnaire**

An initial section of the questionnaire included personal and practice demographics, personal pain experiences, pain management training, and numbers of patients with pain problems seen. Knowledge, attitudes, and reported behaviors were all framed in reference to terminally ill patients. Some questions were modified from other surveys, such as the Wisconsin Pain Initiative (personal communication, D. Weissman, MD); most were written de novo based on published reviews of appropriate pain management literature. See Table 2 for details of variable operationalization.

Knowledge in several categories was assessed with three questions per category (two for opioid side effects) with each question covering a different facet of that knowledge category. Knowledge questions were answered by “agree,” “disagree,” or “don’t know.” (Don’t know responses were deemed to be intermediate
Table 1

Background Characteristics by Specialty Type

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Oncology</th>
<th>Internal medicine</th>
<th>Family practice</th>
<th>Surgery</th>
<th>Gynecology</th>
<th>Neurology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent female</td>
<td>27.3</td>
<td>13.6</td>
<td>11.7</td>
<td>7.3</td>
<td>2.3</td>
<td>36.2</td>
</tr>
<tr>
<td>Median age (years)</td>
<td>41</td>
<td>43</td>
<td>41</td>
<td>44</td>
<td>45</td>
<td>42</td>
</tr>
<tr>
<td>Medical training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent receiving formal training in pain management</td>
<td>90.9</td>
<td>37.4</td>
<td>35.0</td>
<td>58.5</td>
<td>39.5</td>
<td>19.6</td>
</tr>
<tr>
<td>Medical practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent in private practice</td>
<td>81.8</td>
<td>85.4</td>
<td>85.0</td>
<td>82.9</td>
<td>90.7</td>
<td>83.0</td>
</tr>
<tr>
<td>Median number of physicians in practice group</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Median number of patients each month with: acute, self-limited pain</td>
<td>7.5</td>
<td>25</td>
<td>20</td>
<td>35.1</td>
<td>27.5</td>
<td>17.1</td>
</tr>
<tr>
<td>on-going or persistent pain, 2&quot; to malignancy or non-malignant terminal illness</td>
<td>20</td>
<td>2</td>
<td>4</td>
<td>3.5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>chronic pain of benign origin</td>
<td>3.5</td>
<td>6</td>
<td>10</td>
<td>10</td>
<td>2.5</td>
<td>4</td>
</tr>
<tr>
<td>Median number of hospice referrals in 1992</td>
<td>20</td>
<td>1.5</td>
<td>3.5</td>
<td>3</td>
<td>1.8</td>
<td>0</td>
</tr>
<tr>
<td>Relevant personal experiences</td>
<td>(Percent with)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family member or close friend who has experienced severe pain due to cancer or terminal illness</td>
<td>63.6</td>
<td>37.5</td>
<td>25.9</td>
<td>47.5</td>
<td>35.7</td>
<td>44.4</td>
</tr>
<tr>
<td>Anyone close who has had drug dependency</td>
<td>36.4</td>
<td>15.1</td>
<td>13.8</td>
<td>29.0</td>
<td>16.7</td>
<td>11.1</td>
</tr>
<tr>
<td>Personal experience of any type of pain longer than 1 month</td>
<td>18.2</td>
<td>28.1</td>
<td>37.9</td>
<td>10.0</td>
<td>21.4</td>
<td>31.1</td>
</tr>
<tr>
<td>Response Rate</td>
<td>100%</td>
<td>64%</td>
<td>59%</td>
<td>61%</td>
<td>72%</td>
<td>67%</td>
</tr>
<tr>
<td>Number</td>
<td>11</td>
<td>199</td>
<td>60</td>
<td>41</td>
<td>43</td>
<td>47</td>
</tr>
</tbody>
</table>

between right and wrong answers.) Knowledge scores are reported as percent correct for each category. Because items within a category assessed different aspects of knowledge, no internal consistency test was performed for the knowledge indices.

Attitudinal indices were developed from three items each. Two additional attitudes were assessed using single items. Responses on attitude items fell on a five-point Likert scale from strongly agree to strongly disagree.

Behavior was assessed by physician reports of frequency of various behaviors and experiences regarding terminally ill patients with ongoing pain. A single index of obstacles to proper care measured problems previously experienced. Other behaviors assessed included overall prescribing patterns and specific medication types and routes used. Responses fell along a four-point scale from never to always.

For multi-item attitude and behavior indices, internal consistency of items was assessed using Cronbach's alpha for three-item indices and the inter-item correlation for two-item indices. These statistics, computed for the entire PCP sample, are reported in Table 2. They indicate acceptable levels of internal consistency except for the major oral opioids, mild rectal analgesics, and major rectal opioids indices. These are reported because of their conceptual logic but should be interpreted with caution.

Analysis Plan

Oncologists were considered to represent ideal local standards of care and were therefore analyzed separately. Primary care physicians were analyzed as a whole and by five specialty groupings (internal medicine and subspecialties; family practice; surgery and subspecialties; gynecologists; and neurologists) and then compared to oncologists.
### Operationalization of Pain Management Knowledge, Attitude, and Reported Behavior Variables

#### Pain Management Knowledge

Index value is percent of items with correct answer (don’t know gets half credit). True and false statements indicated by T and F in parentheses.

**Morphine facts**
- Morphine is the standard opioid used to treat cancer pain. (T)
- All malignant pain, regardless of origin, responds to morphine. (F)
- Pain due to bony metastases is best relieved by a combination of an opioid and a nonsteroidal anti-inflammatory agent. (T)

**Factual basis for assessment**
- Patients with severe chronic malignant pain will have observable changes in vital signs. (F)
- A patient who is able to sleep cannot be experiencing severe pain. (F)
- Unrelieved pain results in symptoms, such as anxiety, depression, and insomnia. (T)

**Patient role in pain assessment**
- Severity of pain is best assessed by an MD or RN. (F)
- The patient should have input about dosing intervals for pain medication. (T)
- The patient with severe chronic malignant pain is the best judge of whether their pain is well controlled. (T)

**Opioid dosing**
- For chronic malignant pain opioids should be dosed on an around-the-clock basis, not on an “as needed” basis. (T)
- Short-acting morphine is the drug of choice when ordering an opioid for breakthrough pain. (T)
- For opioid-responsive pain, there is no ceiling dose of morphine (that is, no dose beyond which additional pain relief is not obtained). (T)

**Opioid equivalences**
- When changing a patient from one opioid to another, it is necessary to start with the lowest dose of the new opioid and titrate to achieve pain relief. (F)
- Thirty mg of oral morphine produces the same analgesia as 10 mg of parenteral morphine. (T)
- Intramuscular (IM) morphine 10 mg is equivalent in analgesic potency to meperidine (Demerol®) 80 mg given IM. (T)

**Opioid side effects**
- When meperidine is given repeatedly by any route, the active metabolite normeperidine may cause central nervous system excitation resulting in tremors, myoclonus, or seizures. (T)
- Constipation due to opioids often responds to the combination of a stool softener and an irritant cathartic. (T)

#### Pain Management Attitudes

Index score is mean across items. Response categories: 0 = strongly agree; 1 = somewhat agree; 2 = neither agree nor disagree; 3 = somewhat disagree; 4 = strongly disagree.

**Salience of pain management; Cronbach’s alpha = 0.65**
- Adequate management of severe pain is not much of a problem for me.
- Most new patients I see have been under-medicated for their pain in the past. (reversed)
- The skilled management of severe pain has a high priority for me. (reversed)

**Lack of fear of addiction; Cronbach’s alpha = 0.80**
- My management of severe pain has been influenced by my experiences with patients with psychologic addiction to drugs.
- My management of severe pain is influenced by my fear of leading to physical dependence on opioids in these patients.
- I would be very concerned about psychologic drug addiction if someone in my immediate family was treated for cancer pain with morphine.

**Lack of fear of drug regulation:** My fear of being investigated by narcotic regulatory agencies influences my decisions about prescribing opioids.

**Willingness to prescribe unrelated to prognosis:** Maximum doses of opioids should be used for pain control only if the patient’s prognosis is 6 months or less.

#### Reported Pain Management Behavior

Index values: 0 = never; 1 = occasionally; 2 = usually; 3 = always.

**Obstacles to proper care experienced. Mean of:**
- How often have you experienced difficulties in treating this type of patient?
- How often have problems with analgesic side effects hindered your efforts to treat?
- How often do the patients you treat with opioids become addicted to these agents?

**Frequency of performance:** When seeing this kind of patient (i.e., patients with pain related to a malignancy or a non-malignant terminal illness), how often do you perform pain assessments (that is, ask patient about location, intensity, duration)?

**Frequency of use of formal tool:** How often do you use a formalized pain assessment tool, such as the one enclosed?

**Frequency of prescribing adjuvants:** How often do you add adjuvant medication, such as NSAIDs or antidepressants, to the pain regimen?
Frequency of prescribing breakthroughs: When using sustained-release opioids, how often do you prescribe an immediate release product, such as morphine sulfate elixir or hydromorphone (Dilaudid®) for "breakthrough" pain?

Fine points of prescribing. Formed from frequencies of prescribing adjuvants and breakthroughs (see two previous variables) as follows: 0 = usually or always on neither; 1 = usually or always on one but not both; 2 = usually or always on both.

Nonopioid oral analgesics. Mean of frequencies of prescribing of aspirin and acetaminophen. Cronbach’s alpha = 0.86.

Moderate oral opioids. Mean of frequencies of prescribing of codeine, hydrocodone, and oxycodone. Cronbach’s alpha = 0.47.

Mild rectal analgesics. Mean of prescribing rectal ASA and rectal acetaminophen. Cronbach’s alpha = 0.47.

Morphine congeners. Mean of frequencies of prescribing of morphine and hydromorphone. Cronbach’s alpha = 0.47.

Meperidine. Frequency of prescribing of meperidine.

Mild rectal analgesics. Mean of prescribing rectal ASA and rectal acetaminophen. Inter-item correlation = 0.31.

Moderate rectal opioids. Mean of prescribing rectal morphine and rectal hydromorphone. Inter-item correlation = 0.18.

Transdermal fentanyl. Frequency of prescribing transdermal fentanyl.

Subcutaneous opioids. Mean of frequencies of prescribing subcutaneous morphine or hydromorphone by bolus injections and by constant infusion pump. Inter-item correlation = 0.48.

Intravenous opioids. Mean of frequencies of prescribing intravenous morphine or hydromorphone by bolus injections, constant infusion pump, and patient-controlled analgesia pump. Cronbach’s alpha = 0.87.

Epidural opioids. Frequency of prescribing epidural hydromorphone or morphine.

SAS was used to perform univariate, bivariate and multivariate analyses. We present the univariate analysis in Tables 1 and 3 and report the highlights of the bivariate analysis. The multivariate analysis, presented in Table 4, summarizes a series of ordinary least squares regressions. These regress selected reported behaviors on all knowledge, attitude, and background variables. Specific behaviors chosen for the regression analysis were, first, those found to contrast most between oncologists and primary care physicians and, second, those we deemed most relevant to patient care to target through educational interventions. Table 4 presents proportions of variance explained (R²) by three classes of variables: (a) demographic, training, practice, and personal experience variables; (b) knowledge variables; and (c) attitude variables.

This is a survey of the entire populations of oncologists and primary care physicians in the study county rather than a sample survey. Therefore, we emphasize substantive rather than statistical significance. Statistical significance deals with the risk of sampling error, which does not apply to this study. Of course, the thresholds for substantive significance are not set by convention as are those for statistical significance.

Results

Background Characteristics

Table 1 presents variables that serve as background to our main focus on the impact of knowledge and attitudes on reported behavior. Background variables include selected demographics, medical training, and practice characteristics, and relevant personal experiences.

Table 1 further delineates background characteristics by specialty type. Primary care respondents had a median age of 43 years with little variation among specialty types. Both primary care physicians and oncologists were overwhelmingly male and worked predominantly in private practice in small group settings. Women physicians had a greater representation in gynecology and neurology and a smaller representation in family practice and surgery.

Only 37% of primary care physicians versus 91% of oncologists had received formal training in pain management. Many more family practitioners and many fewer gynecologists had undergone some sort of formal training. Oncologists saw many more patients with ongoing pain thought secondary to a terminal illness and referred many more patients to the local hospice. Primary care physicians, especially family practitioners and neurologists, reported seeing more patients with acute, self-limited pain, than oncologists. The numbers of patients with chronic pain thought to be of nonmalignant origin did not vary greatly among oncologists and primary care physicians, with the exception of neurologists who reported seeing large numbers of these patients. Oncologists also reported more personal experience among their friends and families with terminal illness pain and with drug dependency. Only neurologists had significantly more frequent personal pain experience of longer than one month’s duration than oncologists.

Knowledge

Table 3 presents univariate findings for knowledge, attitudes and reported behaviors.
Table 3
Pain Management Knowledge, Behavior, and Attitudes by Physician Type

<table>
<thead>
<tr>
<th>Knowledge (mean percent right)</th>
<th>Oncology</th>
<th>Primary care</th>
<th>Internal medicine</th>
<th>Family practice</th>
<th>Surgery</th>
<th>Gynecology</th>
<th>Neurology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine facts</td>
<td>93.9</td>
<td>84.8</td>
<td>88.0</td>
<td>88.3</td>
<td>81.7</td>
<td>83.3</td>
<td>69.0</td>
</tr>
<tr>
<td>Factual basis for assessment</td>
<td>87.9</td>
<td>85.3</td>
<td>83.9</td>
<td>90.1</td>
<td>86.9</td>
<td>75.5</td>
<td>88.9</td>
</tr>
<tr>
<td>Patient role in pain assessment</td>
<td>95.5</td>
<td>86.7</td>
<td>89.9</td>
<td>84.2</td>
<td>83.7</td>
<td>85.7</td>
<td>90.5</td>
</tr>
<tr>
<td>Opioid dosing</td>
<td>89.4</td>
<td>72.1</td>
<td>71.8</td>
<td>75.0</td>
<td>70.3</td>
<td>76.2</td>
<td>54.8</td>
</tr>
<tr>
<td>Opioid equivalences</td>
<td>84.8</td>
<td>63.6</td>
<td>69.4</td>
<td>66.7</td>
<td>56.0</td>
<td>57.6</td>
<td>78.6</td>
</tr>
<tr>
<td>Opioid side effects</td>
<td>90.9</td>
<td>78.4</td>
<td>79.1</td>
<td>83.8</td>
<td>76.8</td>
<td>74.3</td>
<td>71.4</td>
</tr>
</tbody>
</table>

Attitudes (mean on scale from 0 to 4)

| Salience of pain management        | 2.97  | 2.26  | 2.49  | 2.16  | 2.14  | 2.07  | 2.22  |
| Lack of fear of addiction          | 3.70  | 2.79  | 2.72  | 2.61  | 2.91  | 2.74  | 2.14  |
| Lack of fear of drug regulation    | 3.55  | 2.61  | 2.77  | 2.16  | 2.71  | 2.91  | 1.86  |
| Willingness to prescribe unrelated to prognosis | 3.82  | 2.51  | 2.64  | 2.39  | 2.49  | 2.53  | 2.00  |

Reported behavior (mean on a scale from 0 to 3)

| Pain assessment Frequency of performance | 2.36  | 2.12  | 2.18  | 2.13  | 2.15  | 1.84  | 2.50  |
| Frequency of use of formal tool        | 1.18  | 1.10  | 1.09  | 1.14  | 1.08  | 1.05  | 1.00  |
| Obstacles to proper care experienced   | 0.88  | 1.06  | 1.15  | 1.07  | 0.95  | 1.00  | 1.17  |
| Final points of prescribing            | 1.55  | 0.95  | 1.05  | 1.18  | 0.68  | 0.75  | 1.00  |
| Frequency of prescribing adjuvants     | 1.73  | 1.79  | 1.86  | 1.32  | 1.41  | 1.96  | 2.17  |
| Frequency of prescribing breakthroughs | 2.73  | 0.99  | 1.18  | 1.22  | 0.95  | 0.41  | 0.40  |

Specific aspects of prescribing

| Nonopioid oral analgesics            | 0.91  | 1.11  | 1.16  | 1.33  | 0.59  | 0.80  | 1.08  |
| Moderate oral opioids                | 1.39  | 1.19  | 1.43  | 1.29  | 1.48  | 1.36  | 1.22  |
| Major oral opioids                   | 1.91  | 1.30  | 1.35  | 1.33  | 1.35  | 1.15  | 0.83  |
| Morphine congeners                   | 1.73  | 0.99  | 1.05  | 0.91  | 1.22  | 0.66  | 0.13  |
| Meperidine                           | 0.73  | 1.03  | 1.05  | 0.78  | 1.33  | 1.00  | 0.67  |
| Mild rectal analgesics               | 0.50  | 0.54  | 0.66  | 0.58  | 0.44  | 0.33  | 0.50  |
| Major rectal opioids                 | 1.27  | 0.26  | 0.35  | 0.40  | 0.00  | 0.89  | 0.00  |
| Transdermal fentanyl                 | 1.64  | 0.53  | 0.76  | 0.72  | 0.21  | 0.34  | 0.38  |
| Subcutaneous opioids                 | 0.77  | 0.46  | 0.50  | 0.37  | 0.75  | 0.38  | 0.23  |
| Intravenous opioids                  | 1.15  | 0.86  | 0.96  | 0.76  | 0.92  | 0.69  | 0.50  |
| Epidural opioids                     | 0.45  | 0.37  | 0.31  | 0.18  | 0.56  | 0.72  | 0.25  |

Local oncologists’ knowledge of the basic facts needed to manage pain in terminally ill patients was very good overall and excellent (mean score > 90% right) in most categories. Knowledge of opioid equivalences, however, was not as good; only 55% knew all three answers here.

In contrast, knowledge scores for primary care physicians were worse for each category in comparison to oncologists. Primary care physicians knew most about morphine facts and the two categories concerning pain assessment. Opioid side effect knowledge was slightly worse. Knowledge of opioid pharmacology was poorest. Only 31% of primary care physicians knew all three opioid dosing answers, and just 19% knew all three opioid equivalence questions.

Specific knowledge, as assessed by individual questions (see Table 3), that was lacking among primary care physicians (mean score ≤ 70%) included: the absence of observable vital sign changes with chronic pain, the role of the patient in assessing pain severity, use of short-acting morphine as the drug of choice for breakthrough pain, the absence of a ceiling dose for morphine, morphine oral/parenteral ratios, and conversion from one opioid to another.

Attitudes

Oncologists agreed about the importance of pain management in terminally ill patients and strongly agreed that they were not concerned about physical dependence or psychological addiction. Oncologists also strongly agreed that they were not influenced by fear of regulatory agency investigation in their prescribing practices and that use of maximum

...
Table 4

Explained Variance for Regressions of Selected Reported Pain Management Behaviors on Background, Knowledge, and Attitude Variable Clusters, Primary Care Physicians Only

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Full model</th>
<th>Demographic, training, practice, and personal experience variables</th>
<th>Knowledge variables</th>
<th>Attitude variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All three clusters</td>
<td>Gross effect</td>
<td>Net effect</td>
<td>Gross effect</td>
</tr>
<tr>
<td>Frequency of pain assessment</td>
<td>0.1917</td>
<td>0.1289</td>
<td>0.1045</td>
<td>0.0606</td>
</tr>
<tr>
<td>Obstacles to proper care experienced</td>
<td>0.3193</td>
<td>0.1724</td>
<td>0.1827</td>
<td>0.0513</td>
</tr>
<tr>
<td>Frequency of prescribing:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjuvants</td>
<td>0.2253</td>
<td>0.1314</td>
<td>0.1447</td>
<td>0.0344</td>
</tr>
<tr>
<td>Breakthroughs</td>
<td>0.3144</td>
<td>0.1093</td>
<td>0.1987</td>
<td>0.0717</td>
</tr>
<tr>
<td>Morphine congeners</td>
<td>0.3974</td>
<td>0.2279</td>
<td>0.1954</td>
<td>0.1146</td>
</tr>
<tr>
<td>Meperidine</td>
<td>0.3215</td>
<td>0.2243</td>
<td>0.2512</td>
<td>0.0492</td>
</tr>
<tr>
<td>Major rectal opioids</td>
<td>0.3525</td>
<td>0.2328</td>
<td>0.2901</td>
<td>0.1148</td>
</tr>
<tr>
<td>Transdermal fentanyl</td>
<td>0.3406</td>
<td>0.2138</td>
<td>0.2075</td>
<td>0.0933</td>
</tr>
</tbody>
</table>

doses of opioids was unrelated to a limited (6 months or less) prognosis.

Primary care physicians reported more moderate attitudes in all these areas than oncologists. Their willingness to prescribe maximum opioid doses regardless of prognosis was the most dissimilar from the oncologists. By specialty groups, family practitioners and neurologists, on average, were more fearful of regulatory agency investigation and neurologists (a small group in the overall population and among respondents) were more fearful of physical dependence and addiction and were less willing to prescribe maximum opioid doses for patients with a prognosis of greater than 6 months.

**Reported Behaviors**

Both oncologists and primary care physicians (overall and by specialty groups) only occasionally had encountered such obstacles to proper care as patients becoming addicted or experiencing side effects. Both groups reported usually doing pain assessments on average, but a formal pain assessment tool was only occasionally used.

Fine points of prescribing behaviors were investigated further through the frequencies of prescribing adjuvants and prescribing breakthrough medications. Both oncologists and primary care physicians reported usually prescribing adjuvant medications (although somewhat less among surgeons). Oncologists on average said they always used breakthrough medication, but primary care physicians reported doing so only occasionally (with gynecologists and neurologists reporting closer to never).

Table 3 depicts specific drug and route prescribing behaviors in detail. Oncologists, as expected, reported usually prescribing oral morphine congeners and transdermal fentanyl and occasionally using non-opioid oral analgesics, moderate oral opioids, major rectal opioids and intravenous opioids. They reported only occasional meperidine usage overall. Indeed, 55% said they never used it, and only 18% reported using meperidine usually and none always. Primary care physicians reported using oral morphine congeners and transdermal fentanyl less often than oncologists; neurologists' reported usage of oral morphine congeners was essentially never. Usage of major rectal opioids was negligible (with the exception of the gynecologists). Reported usages of meperidine and other medications and routes were similar between oncologists and primary care physicians.

**Bivariate Relationships**

Given the assumption in the literature that pain management behavior is a function of knowledge and attitudes, substantial bivariate relationships between behaviors and all the independent variables were surprisingly rare. Specialty classification was substantively related to the prescribing behaviors of using adjuvants and breakthrough medications and the majority of the specific medication usages.

Taking a correlation of 0.20 or greater as substantively noteworthy, we found no such correlations of behaviors with the categories of
demographics, medical training or relevant personal experience. Among medical practice variables, reported behaviors were occasionally correlated significantly with the number of hospice referrals, numbers of patients with ongoing pain secondary to terminal illness, and numbers of patients with chronic benign pain. Surprisingly, correlations of reported behaviors with knowledge variables were quite scattered.

The attitude variables were only somewhat more regularly correlated with the stated behaviors. Salience of pain management showed a weak positive correlation (0.23) with the behavior construct of obstacles to proper care, while lack of fear of addiction correlated negatively (and appropriately) with this same behavior construct (−0.21). Lack of fear of addiction also showed weak correlations with other general and specific reported behaviors as did the willingness to prescribe unrelated to prognosis. (Tables reporting all the bivariate relationships are available from the authors upon request.)

Regressions

Table 4 reports regressions of selected behaviors to determine which clusters of independent variables made large net contributions (that is, after taking account of all other variables) to explaining the variation in the reported behavior. Most of the variation in the behaviors remained unexplained despite all the information gathered in this study. R² did not exceed 0.40 for any behavior analyzed. The independent variables did, however, explain substantial portions of the variance in each reported behavior. The demographic, training, medical practice, and personal experience variable cluster had by far the greatest gross effect (that is, before taking account of other variables) and the greatest net effect on each stated behavior. The knowledge and attitude clusters made little net contributions to explaining reported behavior. This was not due to multicollinearity since the gross effects of these clusters were also small. The pattern of effects suggests possible interactions or suppressor effects to be explored in future analyses.

Discussion

Study Strengths

This study of practicing community physicians is one of only a few to survey reported pain management practices. Physicians are a particularly difficult population to survey. By following standard survey methodology, we obtained an unusually high response rate for a survey of physicians. This response is acceptable even for populations less difficult to survey. In addition, we pretested our instrument carefully in order to assure ourselves that physicians would understand the questions in the sense we meant them. Both the high response rate and the pretest give us confidence in the validity of our findings.

The questionnaire included multiple items for key constructs. The internal consistency of the indices constructed from these items was assessed at both the pretest and final survey stages.

The survey focused on pain management in all the terminally ill, not just in cancer patients as has been common in the pain management literature. In addition, we targeted all physician groups known to provide primary care for terminally ill patients in our community, yielding an unusually inclusive physician data base.

The study made detailed assessments of knowledge, attitudes, and reported general behaviors. It is the only study to our knowledge to document reports of specific prescribing behaviors. The survey allowed respondents to make finer distinctions than has been typical in reporting their attitudes and behaviors. Administered just prior to the publication by the U.S. Department of Health and Human Services of the Clinical Practice Guideline on the Management of Cancer Pain, the survey could serve as a baseline for future assessment of the effects of the guidelines. Knowledge, preferred attitudes, and ideal behaviors assessed in this survey are identical to those supported by the Clinical Practice Guidelines.

Study Limitations

We have not measured actual behaviors. Given the overall similarity of general prescribing behaviors here between oncologists and primary care physicians, one would expect pain control to be quite good in our community. Our experience at the local hospice con-
firms recent literature, however, that some patients’ pain is poorly controlled. This conflict between reported and verified behaviors may be explained in part by respondents’ tendency to report socially desired behaviors rather than actual practices. To this extent, reported behaviors function like attitudes. Forty per cent of the primary care physicians surveyed here do not refer to the local hospice. This limits what we can say about actual behavior among the primary care physicians. We have no reason to think, however, that behavior is more desirable among those who do not refer to hospice.

Also, knowledge and attitudes may have changed within the last year due to two events: the publication of the Cancer Pain Management Guidelines, which a few local continuing medical education efforts have tried to disseminate, and the opening of a Palliative Care Unit in one of the two large local hospitals. These may have changed the levels of knowledge, desirable attitudes, and behavior, and the relationships among them. A second wave survey would clarify changes engendered by these new guidelines and the Palliative Care Unit.

Last, the local physicians surveyed are clearly as knowledgeable as other primary care physicians recently surveyed. In addition, one-half are only 13 years out of residency training and 90% less than 27 years out. The majority, moreover, practice at two large hospitals offering services equivalent (except for transplantation) to those at nearby university medical centers. Therefore, although limited to one geographic area, we should not expect this population to be poorly informed in comparison to physicians nationwide.

Summary and Interpretation of Results

Local oncologists have good to excellent knowledge, ideal attitudes and close to ideal behaviors. One exception is the infrequent use of a pain assessment tool, a practice which is just now gaining acceptance in local hospitals. In comparison, primary care physician knowledge about pain management in the terminally ill is more deficient, especially in areas of dosing and equivalences. This is not unexpected given the infrequency with which such physicians prescribe strong opioids in the outpatient population. However, their lack of knowledge concerning vital points of pain assessment and the use of breakthrough medication is surprising. The fact that 40% of these primary care physicians thought there was a ceiling dose of morphine is of even greater concern. These ongoing knowledge deficits among practicing physicians of basic facts taught to current medical students raises questions about the effectiveness of traditional continuing medical education methods.

Attitudes reported by primary care physicians are less ideal than those of oncologists. Notably, the salience of pain management is somewhat less ideal for primary care physicians. This may have affected other attitudes. The largest attitudinal gap, and perhaps the most problematic, concerns willingness to prescribe opioids without regard to prognosis. Although measured differently, our result recalls that reported in other recent studies.

General behaviors reported by primary care physicians are not greatly different from those of oncologists with the important exception of the frequency of prescribing breakthrough medications. Palliative care specialists and oncologists recognize the central importance of prescribing breakthrough medications to patient comfort and ongoing pain control.

Examination of specific prescribing behaviors reveals definite patterns. Oncologists and primary care physicians reported using such advanced medical technology as subcutaneous, intravenous and epidural infusions in similar frequencies. Home use of these routes by primary care physicians has been uncommon in our experience, but we expect that it may increase as primary care physicians learn from oncologists and other specialists in the hospital setting. Although oncologists report somewhat greater use of oral morphine congeners, the largest differences in specific prescribing behaviors lie in the use of rectal and transdermal medications. These data suggest greater comfort of oncologists with multiple routes of drug administration; primary care physicians may be more likely to resort to higher technology (and more costly) invasive routes when the oral route fails.

The survey revealed few differences by specialty type. We hypothesize that this relative uniformity results from the few terminally ill patients now cared for by the primary care physician population and for the tendency of
customary prescribing knowledge and behaviors learned during residency to persist into practice. The neurologists, a small physician population who see many patients with chronic pain of nonmalignant origin, are an exception. Variations in knowledge, attitudes and specific behaviors between neurologists and other primary care physicians may arise from this difference in patient populations.

Not surprisingly, specialty classification was the only background variable to have any effect on behavior. Specific prescribing behaviors were more impacted than general behaviors. Other medical practice variables affecting behavior correlate with expected differences in patient populations served, such as numbers of terminally ill patients seen, and number of patients referred to a hospice.

Knowledge and attitudes had virtually no measured impact on reported behavior. Past research on pain management behavior has rested on the assumption of these relationships. Standard continuing medical education designs reflect this assumption as well. Still, we should not be surprised at this negative finding. Even enormous expenditures to convince the public to adapt ’healthy life style’ behaviors have met with at best partial success. From diet to smoking, the focus has been on improving knowledge and attitudes as the way to improve behavior. More generally, social psychologists have known for decades that the relationship between attitudes and behavior is complex and problematic. Why should physicians’ behaviors be more readily shaped by attitudes and knowledge than the general public’s? They are part of the same social structural and cultural matrix.

Implications

Prior attempts to improve pain management practices have focussed on changing physician knowledge and attitudes through traditional continuing medical education methods. These methods, which emphasize lectures and varying case-discussion formats, has not proven effective. In light of this research, we can better understand the limited effectiveness of these efforts.

As of 1992, 28 states had undertaken Cancer Pain Initiatives, but their impact remains unknown so far. Some have suggested even broader nationwide efforts. In Japan, a combination of dissemination of guidelines, changes in drug regulatory laws, and public information campaigns appears to have altered physician pain management behavior significantly. The publication of Cancer Pain Management Guidelines by the U.S. government and in the literature is a first attempt here to impact physician pain management behavior. However, physician familiarity with published guidelines on other topics is not great, and the impact of published guidelines on actual pain management practice behavior remains unevaluated.

Directed, one-on-one physician education has changed some prescribing patterns. Learned colleagues appear particularly effective as instructors. The pharmaceutical industry, moreover, has developed highly persuasive ’detailing’ techniques. The ineffectiveness of traditional continuing medical education, coupled with the disjuncture between knowledge, attitudes, and behavior demonstrated here, suggest a need for greater attention to alternate approaches.

We would propose that effective medical education for practitioners in this area will require an entirely new approach based in part on physician background, particularly specialty. Emphasis on guideline implementation, community-wide use of formal pain assessment tools, physician behavior oversight and feedback, public education, and consideration of the use of standing orders and formula restrictions may be more effective than our current techniques.

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References


