

Special Article

Nurses' Knowledge of Pain Assessment and Management: How Much Progress Have We Made?

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Abstract

Undertreatment of pain and lack of knowledge about pain management have been evident for approximately two decades. Because nurses are often the cornerstone of pain management, nurses' knowledge in this area is especially important. This paper explores indications of progress in the level of nursing knowledge about basic aspects of pain management. The literature is reviewed and findings from recent (1995) surveys of nurses' knowledge are compared with results of similar surveys conducted beginning in 1988. Improvements in nurses' knowledge of pain assessment, opioid dosing, and likelihood of addiction seem to have occurred. However, knowledge deficits continue. Fewer than one-half of the nurses surveyed understand that the patient's self report of pain is the single most reliable indicator of pain and that the nurse should increase a previously safe but ineffective dose of opioid. Findings from surveys on addiction reveal that the longer the patient receives opioids the more concerned nurses become about causing addiction. Nevertheless, results of current knowledge surveys of nurses suggest that educational efforts probably have been beneficial and should continue. To maximize the impact of educational efforts, content in basic and continuing education courses should be prioritized and critically evaluated for relevance and accuracy, especially content related to addiction. Early in the education of nurses, responsibility for pain assessment and use of analgesics must be instilled. *J Pain Symptom Manage* 1997;14:175-188. © U.S. Cancer Pain Relief Committee, 1997.

Key Words

Addiction, assessment, nursing education, nurses' knowledge, opioid dose, pain, physical dependence, surveys, tolerance.

Introduction

Undertreatment of pain was documented in

the 1970s and was thought to be due in part to lack of education of health-care professionals.^{1,2}

Consequently, increasingly numerous efforts were made over the next two decades to reeducate health-care professionals, culminating in the development and widespread dissemination of clinical practice guidelines.³⁻⁵

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Despite this, clinical practice has changed very little, and improvements in pain management appear to occur slowly.^{6,7}

Undertreatment of pain persists. As an example, the patient population that has been targeted for improved pain management for the longest period of time is probably terminally ill patients, the focus often being on those with cancer pain. In the early 1970s, principles of palliative care were introduced into the United States, and the first officially recognized hospices began opening their doors. In 1986, the World Health Organization estimated that application of existing knowledge about analgesic therapy could result in effective management of pain in up to 90% of patients with cancer.⁸ Yet, in the 1990s, evidence suggests that approximately one-half of terminally ill patients needlessly experience moderate to severe pain. A survey conducted in 1990–1991 of 1308 patients with metastatic cancer from 54 cancer treatment locations revealed that of those who had pain, 36% had pain severe enough to impair function, and 42% received inadequate analgesics.⁹ Beginning in 1989, a 4-year study of over 9000 terminally ill patients in five teaching hospitals revealed that 50% of conscious patients who died in the hospital experienced moderate to severe pain at least one-half the time.¹⁰

Lack of knowledge also persists. The results of countless numbers of surveys over the last 20 years provide incontrovertible proof that many nurses caring for patients with pain lack adequate information about pain management (see below). Many pain specialists and nurses in general practice are becoming weary of these repeated announcements. Is there any encouraging news? Although nurses' level of knowledge is inadequate, is there any evidence that more nurses practicing today possess information about pain management than their counterparts of 5–7 years ago?

The purpose of this paper is to review the literature on nurses' knowledge of pain management and to present the findings from current surveys (1995) of nurses' knowledge of pain assessment, opioid dosing, and likelihood of addiction. These results will be compared with those of similar surveys of nurses' knowledge conducted beginning in 1988.

Assumptions About Nursing Responsibilities and Required Knowledge

Any study⁶ of nurses' knowledge of pain management is based on assumptions about what nurses should know to provide a high quality of care for patients with pain. Nurses tend to spend more time with patients with pain than any other health team members. It is the nurse who performs many interventions for pain relief or further individualizes for the patient those interventions prescribed or performed by others. It is also the nurse who is most likely to be in a position to evaluate the effectiveness of the pain management plan and to initiate any necessary changes.

Thus, nursing activities related to pain management are numerous, and considerable knowledge is required. It is, therefore, challenging to identify only a few specific items of information that all nurses caring for patients with pain should possess. Two of the many activities routinely performed by nurses are assessment of pain intensity and administration of opioid analgesics. Based on current clinical practice guidelines,^{3–5} some of the knowledge areas essential to perform those tasks can be identified, as follows:

1. Self-report of pain is the single most reliable indicator of pain intensity. Behaviors and vital signs should not be used instead of self report. Nursing assessment of pain intensity requires, whenever possible, teaching the patient how to use a pain rating scale and recording the pain rating numbers reported by the patient.^{3,5}
2. When an opioid dose is determined to be safe but ineffective for the individual patient, the opioid dose should be increased by 25%–50%.⁵
3. Addiction caused by using opioids for pain relief is rare, and concerns about causing addiction should not interfere with appropriate administration of opioid analgesics.^{3–5}

Review of Literature

Most surveys of knowledge and attitudes about pain management have been used at a

single point in time. Survey items are often developed by the investigator and used in a single study. Therefore, it is difficult to identify whether or not nurses' knowledge has improved. However, there is no shortage of studies to show that many nurses in years past have lacked knowledge in the three areas cited above. Following are selected studies that illustrate these deficiencies.

Self-Report of Pain

Nurses do not always follow the simple guideline of asking the patient about pain and accepting the patient's report. In one study conducted in the late 1970s, nurses ($N = 443$) ranked the patient's verbal report of pain as fifth on a list of seven indicators of pain.¹¹ In another survey conducted in the late 1980s, 78 nurses were asked how they determined whether a patient was experiencing pain.¹² Less than 75% reported that they first asked a direct question.

Using vignettes, a survey conducted in 1990 asked nurses ($N = 456$) to record their assessments of patients' pain intensity.¹³ More than one-half the nurses selected a pain rating other than what the patient reported. This study along with other surveys using a similar vignette format revealed that factors influencing nurses willingness to accept and record the patient's self-report of pain included the patient's behavior, age, vital signs, and life-style.¹⁴⁻¹⁶ For example, nurses were most likely to accept and record the patient's pain report if the patient was grimacing, had elevated vital signs, was elderly, or led a traditional life-style.

Increasing the Opioid Dose

In a survey conducted in the late 1970s, nurses ($N = 121$) were asked to read four patient vignettes and select a dose of opioid analgesic.¹⁷ All four patients had received meperidine (Demerol® 100 mg intramuscularly (IM), all stated that this did not completely relieve the pain, and all were in severe pain 4 hr after the last dose. No side effects had occurred. All patients had a physician's order for meperidine at 50-150 mg every 3-4 hr. The nurses were asked to select a medication dose for the next injection. The correct choice for all patients was 150 mg, but 36% chose to repeat the same ineffective dose or to administer a lower dose.

Four surveys using a similar vignette format examined how nurses' choices of opioid doses were influenced by the patient's behavior, vital signs, age, and life-style.¹³⁻¹⁶ In most of the patient situations presented in the vignettes, roughly 50% or more of the nurses did not increase the dose of opioid when the previous dose had been safe but ineffective. Nurses were least likely to administer a higher dose of morphine to patients who were smiling, had low normal vital signs, were elderly, or had a life-style that included unemployment, beer drinking, and riding a motorcycle.

Addiction

Exaggerated fear of causing addiction by administering opioid analgesics is well documented. In one survey, 66% of practicing nurses ($N = 106$) and 63% of nursing students ($N = 101$) believed that more than 10% of hospitalized patients with organic pain become addicted.¹⁸

In a survey of both house staff ($N = 57$) and nurses ($N = 70$), a question was asked regarding the probability of a hospitalized patient becoming addicted after treatment for 10 days with 100 mg meperidine IM every 4 hr.¹⁹ Only 15.8% of the house staff and 11.4% of the nurses selected the correct answer of less than 1%. The likelihood that addiction would occur in 16% or more of patients was selected by 39% of the physicians and 48% of the nurses.

In a survey conducted during 1988-1989 of 2459 attendees at pain programs, mostly nurses, 43% knew that the incidence of addiction was 1% or less than 1%.²⁰ An alarming 23% thought addiction would occur in 25% or more of patients receiving opioid analgesics for pain relief. During the following 12 months (1989-1990), a survey of 1781 nurses using the same survey item revealed that the exaggerated fear that addiction would occur in 25% or more of patients receiving opioids for pain control had risen to 30.4%, while those correctly selecting less than 1% remained much the same (41.3%).²¹ This survey item included definitions of addiction, physical dependence, and tolerance and asked respondents to select <1%, 5%, 25%, 50%, 75%, or 100%.

Poorer results were obtained in two statewide surveys of nurses that used a true/false item stating that "the incidence of psychologi-

cal dependence as a result of the legitimate use of narcotic pain-relieving drugs in patients with cancer is less than one in 1,000 patients." A survey in Wisconsin published in 1992²² and a survey in North Carolina published in 1996²³ revealed essentially no differences in the nurses' responses. The question was correctly answered as true by only 16% and 17% of nurses in Wisconsin and North Carolina, respectively. In both surveys, this was the most frequently missed question. However, these surveys did not offer a definition of addiction, physical dependence, and tolerance. Confusion about these terms may have increased the number of wrong answers.

To identify factors that might increase nurses' concerns about addiction occurring as a result of opioid use for pain relief, other questions were added to surveys distributed from 1992 to 1993.²⁴ These questions explored whether or not nurses' concerns about addiction were influenced by the patient's age (under 12 years, 13–30 years, and over 30 years), length of time on opioids (1–3 days, 14–30 days, and 3–6 months), specific opioid used (codeine or morphine), and the cause of a chronic pain condition lasting 2 years (cancer or nonmalignant). Survey results ($N = 656$) revealed that the major factor causing increased concern about addiction was length of time on opioids, with 40% of the respondents believing that the likelihood of addiction was 25% or greater in patients receiving opioids for 3–6 months.

Comparison of Similar Surveys of Nurses' Knowledge: Past and Present

Over the past decade, the authors have presented numerous educational programs to nurses on various aspects of pain management. These experiences also provided opportunities to survey nurses' knowledge of the subject. While some of the knowledge surveys changed over time to reflect changes in nursing practice and to accommodate new recommendations for pain management, some of the surveys remained similar enough to allow comparison of the results over time.

Specifically, some surveys on addiction, conducted beginning in 1988, are similar to ones conducted in 1995. Other surveys about assessment and use of analgesics, conducted in

1990, are also similar to ones conducted in 1995. Descriptions and results of these 1995 surveys are presented, and then the findings are compared with comparable surveys conducted several years earlier.

1995 Surveys of Nurses' Knowledge

All surveys were distributed as a pretest to nurses attending pain conferences and were completed by participants prior to any content presented on pain. Consent to participate in the survey was implied by return of the completed survey.

Description of Nurses Surveyed

For the survey of assessment and choice of opioid dose, data were collected from February to May of 1995 in nine locations in the United States, across the three regions (western, midwestern, and eastern). Over 900 surveys were completed. From these, 150 surveys were randomly selected from each of the three regions to match the number of nurses in the original survey ($N = 456$) completed in 1990, yielding a total of 450 surveys. In this group, the highest level of education was associate degree for 28.4%, diploma for 18.4%, and bachelors degree for 38.0%. The average number of years of experience was 16.1 years, and average age was 41.9 years. Most nurses practiced in hospital settings (55.8%) or in hospice (26%). The most common areas of clinical practice were medical/surgical (53.1%) and oncology (19.1%).

For the addiction survey, data were collected from May to June of 1995, for a total of 537 surveys. Conferences were held in eight cities in seven states (two states in both the western and midwestern regions and three states in the eastern region). In this group of nurses, the highest level of education was associate degree for 21.8%, diploma for 17.3%, and bachelors degree for 42.1%. The average number of years of experience was 15.4 years, and average age was 40.7 years. Most nurses practiced in hospital settings (78.6%). The most common areas of clinical practice were medical/surgical (50.1%) and oncology (17%).

Description of Survey Questionnaires

The survey questionnaires changed slightly over the years. The final surveys are presented in Appendices 1 and 2.

Surveys on assessment and choice of opioid dose.

The original vignette survey related to pain assessment and choice of opioid dose was conducted during 1990.¹³ This survey used a 0–5 pain rating scale and the IM route of administration, whereas the 1995 survey uses 0–10 and the intravenous (IV) route of administration. In 1990, 0–5 seemed to be more commonly used than 0–10, and most nurses were more familiar with IM administration than IV. Further, the original survey did not state the goal of pain management, whereas the current survey states that a pain rating of 2 has been established as the goal. Results of the survey used in 1995 (Appendix 1) are reported here for the first time.

Addiction surveys. Beginning in 1988, the authors distributed a variety of surveys that included one general question about addiction that was almost identical to the present survey question 1. In all surveys, a definition of addiction that distinguished it from physical dependence and tolerance preceded the addiction question(s). The definition used for surveys conducted from 1988 to 1993^{20,21,25} was taken from a pharmacology text current during that time:²⁶ "Narcotic/opioid addiction is defined as psychological dependence accompanied by overwhelming concern with obtaining and using narcotics for psychic effect, not for medical reasons. It may occur with or without the physiological changes of tolerance to analgesia and physical dependence."

The definitions used in the 1993 survey²⁴ and in the present 1995 survey (Appendix 2) were from the American Pain Society booklet⁴ and were stated as follows: "Narcotic/opioid addiction, or psychological dependence, is a pattern of compulsive drug use characterized by a continued craving for an opioid and the need to use the opioid for effects other than pain relief. Physical dependence and tolerance are not addiction. Tolerance to opioid analgesia means that a larger dose of opioid analgesic is required to maintain the original effect. Physical dependence on opioids is revealed in patients taking chronic opioids when the abrupt discontinuation of an opioid or the administration of an opioid antagonist produces an abstinence syndrome (withdrawal)."

Length of time on opioids was found to increase nurses' concerns about development of addiction in patients receiving opioids for pain relief.²⁴ Because the likelihood of physical dependence and tolerance increases with length of time on opioids, the survey was further modified in the present 1995 survey to include questions about physical dependence and tolerance.

*Responses to 1995 Surveys**Surveys on assessment and choice of opioid dose.*

The case vignettes state that both patients rated their pain as 8 out of 10. Thus, a pain rating of 8 should have been recorded for both patients. The results are presented in Table 1. For the smiling patient, only 73.8% recorded 8, but for the grimacing patient 87.1% recorded 8. Thus, nurses were more likely to accept the report of pain from the grimacing patient than from the smiling patient.

Not too surprisingly, the nurses were also more likely to increase the morphine dose for the grimacing patient. Both patients had received morphine 2 mg IV 2 hr ago, half-hourly pain ratings had ranged from 6 to 8 out of 10, and no clinically significant side effects such as sedation had occurred. The pain rating goal was 2. Nurses were given a choice of administering no morphine or 1 mg, 2 mg, or 3 mg IV. Morphine 3 mg IV was the correct choice for both patients. However, only 51.5% of the nurses would increase the dose for the smiling patient, whereas 71.3% would increase the dose for the grimacing patient (Table 1). Undertreatment of pain was more likely for the smiling patient, with 26.7% administering either no morphine or 1 mg, one-half the dose that was ineffective previously. For the grimacing patient, only 9.6% took this action. A comparable number of respondents administered the previously ineffective dose of 2 mg to both patients, 21.8% for the smiling patient; 19.15% for the grimacing patient.

Addiction surveys. Responses to the survey items related to addiction, physical dependence, and tolerance are presented in Table 2. In answer to the question about the overall likelihood of addiction occurring in patients who receive opioids for pain relief, 62.7% chose the correct answer of less than 1% of patients, and 13.3% showed an exaggerated fear

Table 1
Nurses' Assessment and Choice of Opioid Dose: 1995 (N = 450)

	Smiling patient		Grimacing patient	
	N	%	N	%
Assessment of pain				
0	9	2.0	0	0.0
1	11	2.4	1	0.2
2	18	4.0	1	0.2
3	25	5.6	1	0.2
4	17	3.8	5	1.1
5	24	5.3	5	1.1
6	13	2.9	10	2.2
7	1	0.2	14	3.1
8*	332	73.8	392	87.1
9	0	0.0	13	2.9
10	0	0.0	8	1.8
Choice of opioid dose				
No morphine	45	10.0	9	2.0
1 mg IV now	75	16.7	34	7.6
2 mg IV now	98	21.8	86	19.1
*3 mg IV now	231	51.5	321	71.3

IV, intravenous.

*Correct answer.

of causing addiction by selecting answers ranging from 25% to 100% of patients who receive opioids for pain relief. For patients receiving opioids for 1–3 days, even more nurses, 86.4%, correctly estimated the likelihood of addiction as less than 1%, and only 3.8% thought that 25% or more of patients would become addicted. However, when the question focused on patients who receive opioids for pain relief for 3–6 months, only 24.1% of the nurses correctly identified the likelihood of addiction occurring as less than 1%, and 34.8% had an exaggerated fear that addiction would occur in 25% or more of patients.

Regarding the likelihood of clinically significant tolerance occurring in patients who receive opioids for 1–3 days, 86.4% of the

nurses knew it was less than 1%, and 80.2% knew that the likelihood of clinically significant physical dependence was less than 1%. Although clinically significant tolerance or physical dependence do not occur in all patients receiving opioids chronically, it should be expected in all patients who receive opioids for 1 month or longer.⁴ Consequently, in answer to the questions about the likelihood of clinically significant physical dependence or tolerance developing in patients after 3–6 months of opioid use, answers of 75% or 100% were accepted as correct. Regarding physical dependence, only 14.2% recognized that this should be assumed in most or all patients, at least 75% up to 100%. Likewise very few nurses (15.6%) recognized

Table 2
Nurses' Knowledge of the Likelihood of Addiction, Tolerance, and Physical Dependence Occurring in Patients Receiving Opioids for Pain Relief (N = 537)

When opioids/narcotics are used for pain relief in the following situations: What percent of patients are likely to develop N(%)						
	<1%	5%	25%	50%	75%	100%
Addiction						
All patients—overall	335(62.7)*	128(24.0)	53(9.9)	14(2.6)	3(0.6)	1(0.2)
Patients who received opioids 1–3 days	459(86.4)*	52(9.8)	12(2.3)	5(0.9)	3(0.6)	0(0.0)
Patients who received opioids 3–6 months	128(24.1)*	219(41.2)	101(19.0)	50(9.4)	29(5.5)	5(0.9)
Tolerance						
Patients who received opioids 1–3 days	385(72.1)*	104(19.5)	31(5.8)	12(2.3)	2(0.4)	0(0.0)
Patients who received opioids 3–6 months	23(4.3)	159(29.9)	157(29.6)	109(20.5)	57(10.7)*	26(4.9)*
Physical dependence						
Patients who received opioids 1–3 days	426(80.2)*	76(14.3)	18(3.4)	9(1.7)	2(0.4)	0(0.0)
Patients who received opioids 3–6 months	59(11.1)	175(32.8)	131(24.6)	92(17.3)	55(10.3)*	21(3.9)*

*Correct answer.

Table 3
Pain Assessment and Opioid Dose: 5 Years Later

	Data collected: 1990 N = 456		Data collected: 1995 N = 450	
	N	%	N	%
Nurses who accepted self-report of pain				
Smiling patient	182	40.7	332	73.8
Grimacing patient	322	71.6	392	87.1
Both patients		<40.7 ^a	324	72.0
Nurses who increased an ineffective dose of morphine				
Smiling patient	148	32.8	231	51.5
Grimacing patient	245	54.0	321	71.3
Both patients		<32.8 ^a	226	50.2
Nurses who correctly answered all questions for both patients		<32.8 ^a	211	46.8

^aEstimates; data not available to make calculations.

Data from 1990 reprinted with permission from reference 13.

that tolerance should be expected in all patients, at least 75% or more of patients, after 3–6 months of opioid administration. In fact, in patients receiving opioids for 3–6 months, 43.9% believed that physical dependence would occur in only 5% or fewer patients and 34.2% believed that tolerance would occur in 5% or fewer patients. Thus, nurses underestimated the likelihood of clinically significant tolerance and physical dependence.

To examine the extent to which nurses confused the likelihood of addiction with the likelihood of physical dependence or tolerance in patients receiving opioids for 3–6 months, answers of less than 1% and answers of 25% or more can be compared for each condition. The likelihood that fewer than 1% of patients would develop addiction, tolerance, or physical dependence was selected by 24.1%, 4.3%, and 11.1%, respectively. The likelihood that 25% or more of patients would develop addiction, tolerance, or physical dependence was selected by 34.4%, 65.7%, and 56.1%, respectively. Thus, beliefs about the likelihood of addiction are not comparable to beliefs about the likelihood of tolerance and physical dependence, suggesting that nurses are not necessarily confusing these terms with addiction.

Comparison of Past and Present Survey Findings

Compared with surveys conducted five years ago, nurses' willingness to record the patient's pain rating as their assessment of the patient's pain has improved (Table 3). Recording the smiling patient's numerical rating of severe

pain increased from 40.7% in 1990 to 73.8% in 1995. Acceptance of the grimacing patient's report of pain was fairly high in the 1990 survey, 71.6%, and increased further to 87.1% 5 years later. In 1990, fewer than 40.7% of the nurses accepted the pain rating of both patients, but in 1995, 72.0% accepted the pain rating of both patients.

Nurses' willingness to increase a safe but ineffective dose of morphine by 50% has also improved (Table 3). In 1990 only 32.8% increased the morphine dose for the smiling patient, but in 1995 this increased to 51.5% of the nurses. More nurses were also willing to increase the morphine dose for the grimacing patient, increasing from 54.0% in 1990 to 71.3% in 1995. Nurses willing to increase the dose for both patients increased from less than 32.8% in 1990 to 50.2% in 1995.

The number of nurses who correctly assessed and treated the pain in both patients did not change greatly. Nurses who correctly recorded the pain rating and increased the opioid dose for both patients rose from less than 32.8% in 1990 to only 46.8% in 1995.

Answers to the general question concerning the likelihood of addiction occurring in patients receiving opioids for pain relief show fairly steady improvement from 1988 through 1995 (Table 4). Nurses selecting the correct answer of less than 1% likelihood of addiction increased from 43.0% to 62.7%. Exaggerated fears of addiction, that is, belief that addiction would occur in 25% or more of patients increased slightly but then declined. Overall, nurses with exaggerated fears of addiction decreased from 23.0% in 1988 to 13.3% in

1995. The largest gains in knowledge about addiction related to pain control occurred between 1992 and 1995.

Discussion

Important limitations exist in using the above survey findings to identify educational needs of the general population of practicing nurses or to confirm any progress in the education of nurses about pain management. Not only were there changes in the surveys themselves, but there is also a problem of sample bias. As a whole the nurses surveyed probably are not representative of practicing nurses. Nurses who attend programs on pain are likely to be more motivated to learn about pain than their counterparts who did not attend and are likely to have already studied the subject.

Further, nurses attending pain programs today, compared with 5–7 years ago, are likely to have a higher level of interest and motivation. Today's nurses may be sent to programs on pain by institutions interested in improving pain management through interdisciplinary pain committees. Nurses are often actively involved in these efforts. Thus, apparent improvement in nurses' knowledge may be due in part to sample bias rather than progress in education.

Nevertheless, nursing knowledge seems to have improved in the three areas examined in these surveys. Over 5 years, 1990–1995, the percent of nurses correctly responding to survey questions about assessment and titration upward of opioid dose has increased, with the greatest increase occurring in the percent of nurses willing to record the pain rating given by the smiling patient. Because the survey item on nursing assessment of pain was identical in both surveys (except for the switch from a 0–5 to a 0–10 pain rating scale) improvement in this area would appear to be due primarily to education. The improvement in percent of nurses who increased the opioid dose is close to a 20% increase (17.3% and 18.7%). However, this finding may be a result not only of education but also of a change in the survey item. The 1995 survey stated that the pain rating goal was 2 out of 10 for both patients. The 1990 survey did not state a goal. When results of the 1990 survey were discussed with nurses they often explained that their reason for not administering anything

or for not increasing the opioid dose was that the patient did not ask for it. The addition of the pain management goal to the 1995 survey was in response to this apparent misunderstanding about the nurses role in administering "as needed" analgesics. Including the goal of pain management may have favorably influenced the nurses to increase the opioid dose, accounting for some of the improvement noted in the current survey.

Findings related to the vignette surveys are encouraging. Still, much remains to be done. Fewer than one-half (46.8%) of the nurses demonstrate a grasp of both of the two basic principles of accepting the patient's self-report of pain and increasing safe but ineffective opioid doses by 25%–50%. In other words, fewer than one-half these nurses would approach the care of the patient with pain by regarding the patient's self-report of pain as the single most reliable indicator of pain and by proceeding to increase an opioid dose that was safe but ineffective.

Over a 7-year period, 1988–1995, fewer nurses responding to the surveys have unwarranted concerns about addiction occurring as a result of opioid use. Presently, 62.7% of nurses correctly identify that overall less than 1% of patients who receive opioids for pain relief will develop addiction, and only 13.3% erroneously believe that addiction will occur in 25% or more of patients. Unfortunately, nurses responses to patients receiving opioids for 3–6 months reveals a much higher level of concern about addiction. Nurses clearly associate addiction with length of time on opioids, and this does not appear to be solely a result of confusion about differences between physical dependence, tolerance, and addiction. These terms were defined in the surveys that produced the findings presented in Tables 2 and 4. Nurses gave quite different answers to the questions about the likelihood of addiction, physical dependence, or tolerance occurring in patients who receive opioids for 3–6 months. Higher percentages of nurses expected tolerance and physical dependence to occur than expected addiction to occur.

The results of studies that do not include definitions of addiction, physical dependence, and tolerance report much lower percentages (16% and 17%) of nurses knowing that the likelihood of addiction is rare.^{22,23} Therefore,

Table 4
Nurses' Knowledge of Likelihood of Addiction Occurring as a Result of Using Opioids for Pain Relief: 1988–1995

	Data collected: 1988–1989 ^a <i>N</i> = 2296 ^e		Data collected: 1989–1990 ^b <i>N</i> = 2063 ^c		Data collected: 1992 ^c <i>N</i> = 150		Data collected: 1992–1993 ^d <i>N</i> = 656		Data collected: 1995 <i>N</i> = 537	
Likelihood of addiction occurring in all patients who receive opioids for pain relief:	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Nurses who correctly identified chance of addiction in patients as <1%	988	43.0	853	41.3	66	43.4	325	49.5	334	62.7
Nurses who had an exaggerated fear of addiction occurring in 25% or more of patients	528	23.0	649	30.4	44	28.9	101	15.4	71	13.3

^aData reprinted with permission from reference 20.

^bData reprinted with permission from reference 21.

^cData reprinted with permission from reference 25.

^dData reprinted with permission from reference 24.

^e*N* adjusted to number responding to question; not all survey respondents answered all questions.

it appears that defining the terms improves the likelihood of correct answers about addiction, but does not allay all the concerns nurses may have. Interestingly, few nurses realized that both tolerance and physical dependence should be expected in all patients who receive opioids for 3–6 months.

Although we prefer to assume that education has caused the improvements in nurses' knowledge about pain control, it is important to note that, in addition to sample bias and changes in the surveys over time, simple survey exposure may have played a large role. For the past few years, the vignette survey has been used by many hospitals throughout the United States to assess staff knowledge, and the survey was also included in a widely viewed video tape. To many, it became affectionately known as the "Andy/Bob" survey. The addiction question (specifically question 1) has also been used in numerous surveys. Possibly some of the improvement in nurses answers is merely a result of having been told the answers to the questions and may neither reflect an understanding of the concepts nor be typical of what nurses actually do in clinical practice.

Whether or not the survey findings provide evidence that improvements have occurred in nurses' knowledge of pain management, it is apparent that serious problems continue to exist. Disagreement between the health-care professional and the patient regarding the patient's pain intensity is one of the most sig-

nificant predictors of inadequate analgesic therapy.⁹ At a very minimum, nurses caring for patients with pain should appreciate that the only scientific tool for measuring pain intensity is the patient's report using a pain rating scale. Apparently, nurses continue to harbor many misconceptions that cause them to doubt patients' reports of pain. Nurses need clarification of the fact that no research has shown that the patient's behavior, vital signs, or life-style is a better indicator of pain intensity than the patient's self-report.

Further, although nurses may record what the patient says, they do not necessarily feel obligated to act upon it. Nurses' willingness to increase a safe but ineffective dose of morphine may be more related to their personal attitude about the patient's report of pain than to their knowledge of the safety of this action. In the 1995 survey, only 51.5% of the nurses increased the opioid dose for the smiling patient but 71.3%, almost 20% more, took this action for the grimacing patient. Thus, there were approximately 20% who felt it was safe to increase the dose but did not do so for the smiling patient. In fact, 71.8% recorded the smiling patient's report of pain, but only 50.5% increased the opioid dose, suggesting that they may not have truly accepted the patient's pain rating.

Continued concern about addiction occurring as a result of opioid use poses a major obstacle to appropriate opioid therapy. A variety

of studies have revealed the detrimental consequences of irrational concerns about addiction. For example, a study of 85 family caregivers of patients with cancer pain revealed that caregivers had considerable fear of addiction in spite of being told that it should not be a major concern.²⁷⁻²⁹ They felt it was their responsibility to try to avoid addiction by limiting the amount of medication used. A survey of 270 patients with cancer revealed that their reluctance to report pain and to use analgesics resulted in poor pain relief and was often due to concerns about addiction.³⁰

A minimum expectation of all nurses who administer opioids to patients for pain relief is that fear of causing addiction should never compromise their willingness to administer effective doses of opioid. In addition, nurses should be proactive in discussing addiction with patients and their families. Routine administration of an abbreviated version of the barriers questionnaire developed by Gordon and Ward³¹ is a simple method of identifying patient's concerns about addiction and other aspects of opioid use such as tolerance.

Recommendations for Nursing Education

Based on the findings of these and other surveys and the authors' experiences with nursing education over the past 10 years, the following recommendations are made. First, because educational efforts directed at nurses seem to have contributed to improving their knowledge about pain management, there is justification for the continuation of these efforts. As a whole, it appears that the longer nurses are exposed to correct information about pain management, the better their knowledge level becomes. For example, nurses from countries with the longest exposure to palliative care (Australia, Canada, and United States) tend to have a higher level of knowledge about cancer pain relief than nurses from countries in which palliative care has been more recently introduced (Japan and Spain).²⁵ While knowledge itself is not enough to guarantee improvement in patient care, it is the first step. In the absence of correct information, patient care is unlikely to improve.

Second, to maximize the impact of educational courses about pain management, the

content of both continuing education offerings and basic nursing programs needs to be examined critically for relevance and accuracy. Nursing textbooks tend to contain inaccurate and irrelevant information about pain management,³² nursing programs devote very little time to the topic of pain,^{33,34} and nursing faculty are often misinformed.³⁴ Suggestions for pain management content in the curriculum of schools of nursing have been developed by the Wisconsin Cancer Pain Initiative³⁵ and the International Association for the Study of Pain.³⁶ Because pain is a rapidly developing science, clinical practice guidelines from the Agency for Health Care Policy and Research³⁵ and the American Pain Society⁴ probably should be relied upon in both basic and continuing education courses to provide current and accurate information.

In response to the need to improve pain content in the curriculum of nursing schools, a study is in progress at City of Hope National Medical Center to assess the impact of a 3-day course to educate the educator. Competitively selected nurse educators from different undergraduate schools across the United States are participating.

Because educational resources, such as time and money, are limited, the amount of time devoted to various pain topics must be evaluated carefully. What does the beginning level nurse need to know to provide an acceptable level of care for the patient with pain? Setting priorities is challenging but necessary. Numerous studies have implicated inadequate assessment and use of analgesics as the reasons for patients suffering pain needlessly. Thus, knowledge of cultural differences in response to pain and the impact of various psychological factors such as anxiety are important but probably are not as essential as knowledge that the best scientific tool for measuring pain intensity is the patient's self-report using a pain rating scale. While knowledge of the neurophysiology of pain ultimately improves use of analgesics, the first step is knowing the principles related to adjusting analgesic doses and intervals between doses. If instructional time is limited, how much of it should be allocated to nondrug pain relief methods, such as relaxation? While nondrug pain treatments certainly have value, no studies to date have attributed inadequate management of acute

pain or cancer pain to a failure to use non-drug pain treatments.

Third, education about substance abuse should be critically appraised. Pain control and addiction are frequently confused with detrimental consequences for both patients with pain and patients who have substance abuse problems. An alliance between nurses in pain management and those in addictions would benefit both nurses and patients. Unfortunately, very few nursing textbooks incorporate accurate information about addiction resulting from use of opioid analgesics. In a review of 14 frequently used nursing textbooks, published between 1985 and 1992, an analysis of content revealed that only one textbook correctly stated the definition of opioid addiction and its likelihood following the use of opioid analgesics for pain control.³² Although substance abuse is a major health-care problem, studies suggest that, like pain, most nurses receive very little education about addiction in their basic nursing programs. A national survey in 1987 revealed that schools of nursing provided approximately 15 hr of instruction on substance abuse.³⁷ In 1994, a similar study of schools of nursing in Iowa concluded that the average hours of classroom instruction was 5 and the average hours of additional clinical instruction was 9.38 hr.³⁸

If nurses do not understand what addiction is and what causes it, they will not be able to develop confidence that opioid use for pain control is not a major cause of addiction. Nurses will not be able to distinguish between medical and nonmedical uses of opioids. Discussion of opioids for pain control probably should include the following: definitions of addiction, tolerance, and physical dependence; characteristics of the disease of addiction; and risk factors associated with the development of addiction. Because of society's legitimate concern about substance abuse and the fact that legal actions are often taken against persons who abuse substances, health-care professionals need help in focusing on addiction as a health-care issue rather than a legal or moral one. That is, addiction is a bad disease, but addicts are not bad people.

Fourth and finally, responsibility for pain management must be instilled in nurses early in their basic educational program. Unfortunately, in a study of baccalaureate nursing stu-

dents in their final course, only 13% thought that cancer pain management should be included in their nursing curriculum.³⁹

Some nurses responding to the vignette survey in which they were asked to select the next dose of morphine not only said that they were not taught that dose titration was their responsibility but also said that they thought the physician knew and should prescribe the exact dose and intervals between doses for the specific patient. These comments and others illustrate that nurses seem largely unaware of the great interindividual variability in response to opioids. Nurses seem to assume that physicians know the analgesic requirements of patients in advance of their prescribing them, and nurses do not appear to embrace their vital role in the titration of opioid doses.

To improve pain management, it is essential that nurses recognize that they are often the cornerstone of the team approach and that they have direct responsibilities related to pain assessment and tailoring of opioid analgesics. Education must prepare them with the knowledge required to execute these tasks. Because nurses are more often present with patients with pain than are other health team members, it is through nurses that most patients have the greatest opportunity to benefit from an interdisciplinary approach and receive a high quality of pain management. Nurses must be encouraged to expand their knowledge and be held accountable for assuming their responsibilities for pain management.

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Appendix I
Survey: Assessment and Use of Analgesics
"Andrew—Robert"

Professional discipline:	Highest education:	Practice setting:	Clinical area:
<input type="checkbox"/> Nursing	<input type="checkbox"/> Student	<input type="checkbox"/> Hospital	<input type="checkbox"/> Medical
<input type="checkbox"/> Pharmacy	<input type="checkbox"/> LPN	<input type="checkbox"/> Home/community	<input type="checkbox"/> Postop/Surg
<input type="checkbox"/> Medicine	<input type="checkbox"/> AD	<input type="checkbox"/> Hospice	<input type="checkbox"/> Oncology
<input type="checkbox"/> Physical therapy	<input type="checkbox"/> Diploma	<input type="checkbox"/> Office	<input type="checkbox"/> Orthopedics
<input type="checkbox"/> Social work	<input type="checkbox"/> Bachelors	<input type="checkbox"/> Other, Specify:	<input type="checkbox"/> Pediatrics
<input type="checkbox"/> Other, Specify:	<input type="checkbox"/> Masters		<input type="checkbox"/> ICU/CCU
	<input type="checkbox"/> Doctorate		<input type="checkbox"/> Other, Specify:

Gender

☐ Female

☐ Male

____ Years experience as health professional.

Directions: Please select one answer for each question.

Patient A: Andrew is 25 years old, and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0–10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

1. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain.

0	1	2	3	4	5	6	7	8	9	10
No pain/discomfort								Worst pain/discomfort		

2. Your assessment, above, is made 2 hr after he received morphine 2 mg IV. Half-hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1–3 mg q1h PRN pain relief" Check the action you will take at this time:

- ☐ a) Administer no morphine at this time.
- ☐ b) Administer morphine 1 mg IV now.
- ☐ c) Administer morphine 2 mg IV now.
- ☐ d) Administer morphine 3 mg IV now.

Patient B: Robert is 25 years old, and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0–10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

1. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain:

0	1	2	3	4	5	6	7	8	9	10
No pain/discomfort								Worst pain/discomfort		

2. Your assessment, above, is made 2 hr after he received morphine 2 mg IV. Half-hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1–3 mg q1h PRN pain relief" Check the action you will take at this time:

- ☐ a) Administer no morphine at this time.
☐ b) Administer morphine 1 mg IV now.
☐ c) Administer morphine 2 mg IV now.
☐ d) Administer morphine 3 mg IV now.

Appendix 2
Addiction Survey

Professional discipline:	Highest level of education:	Practice setting:	Clinical area:
<input type="checkbox"/> Nursing <input type="checkbox"/> Pharmacy <input type="checkbox"/> Medicine <input type="checkbox"/> Physical therapy <input type="checkbox"/> Social work <input type="checkbox"/> Other, Specify:	<input type="checkbox"/> Student <input type="checkbox"/> LPN <input type="checkbox"/> AD <input type="checkbox"/> Diploma <input type="checkbox"/> Bachelors <input type="checkbox"/> Masters <input type="checkbox"/> Doctorate	<input type="checkbox"/> Hospital <input type="checkbox"/> Home/community <input type="checkbox"/> Hospice <input type="checkbox"/> Office <input type="checkbox"/> Other, Specify:	<input type="checkbox"/> Medical <input type="checkbox"/> Postop/Surg <input type="checkbox"/> Oncology <input type="checkbox"/> Geriatrics <input type="checkbox"/> Pediatrics <input type="checkbox"/> Orthopedics <input type="checkbox"/> ICU/CCU <input type="checkbox"/> ER <input type="checkbox"/> OR <input type="checkbox"/> OB/GYN <input type="checkbox"/> Other, Specify:

_____ Years experience as health professional

_____ Age

NOTE: Please use the following definitions to answer the questions, American Pain Society, 1992

Narcotic/opioid *addiction* or psychological dependence, is "a pattern of compulsive drug use characterized by a continued craving for an opioid and the need to use the opioid for effects other than pain relief." Physical dependence and tolerance are not addiction.

Tolerance to opioid analgesia "means that a larger dose of opioid analgesic is required to maintain the original effect."

Physical dependence on opioids "is revealed in patients taking chronic opioids when the abrupt discontinuation of an opioid or the administration of an opioid antagonist produces an abstinence syndrome" (withdrawal).

Circle one number closest to what you consider the correct answer.

When opioids/narcotics are used for pain relief in the following situations:	What percent of patients are likely to develop opioid/narcotic ADDICTION?					
1. All patients—overall	<1%	5%	25%	50%	75%	100%
2. Patients who receive opioids for 1–3 days	<1%	5%	25%	50%	75%	100%
3. Patients who receive opioids for 3–6 months	<1%	5%	25%	50%	75%	100%
	What percent of patients are likely to develop clinically significant opioid TOLERANCE?					
4. Patients who receive opioids for 1–3 days	<1%	5%	25%	50%	75%	100%
5. Patients who receive opioids for 3–6 months	<1%	5%	25%	50%	75%	100%
	What percent of patients are likely to develop clinically significant opioid PHYSICAL DEPENDENCE?					
6. Patients who receive opioids for 1–3 days	<1%	5%	25%	50%	75%	100%
7. Patients who receive opioids for 3–6 months	<1%	5%	25%	50%	75%	100%

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