

Postoperative Pain Experience: Results from a National Survey Suggest Postoperative Pain Continues to Be Undermanaged

Jeffrey L. Apfelbaum, MD*, Connie Chen, PharmDt, Shilpa S. Mehta, PharmDt, and Tong J. Gan, MD†

*Department of Anesthesia and Critical Care, The University Chicago Hospitals, Chicago, Illinois; †Pharmacia Corp., Skokie, Illinois; ‡Department of Anesthesiology, Duke University Medical Center, Durham, North Carolina

Postoperative pain can have a significant effect on patient recovery. An understanding of patient attitudes and concerns about postoperative pain is important for identifying ways health care professionals can improve postoperative care. To assess patients' postoperative pain experience and the status of acute pain management, we conducted a national study by using telephone questionnaires. A random sample of 250 adults who had undergone surgical procedures recently in the United States was obtained from National Family Opinion. Patients were asked about the severity of post-surgical pain, treatment, satisfaction with pain medication, patient education, and perceptions about postoperative pain and pain medications. Approximately 80% of patients experienced acute pain after surgery. Of these patients, 86% had moderate, severe, or extreme

pain, with more patients experiencing pain after discharge than before discharge. Experiencing postoperative pain was the most common concern (59%) of patients. Almost 25% of patients who received pain medications experienced adverse effects; however, almost 90% of them were satisfied with their pain medications. Approximately two thirds of patients reported that a health care professional talked with them about their pain. Despite an increased focus on pain management programs and the development of new standards for pain management, many patients continue to experience intense pain after surgery. Additional efforts are required to improve patients' postoperative pain experience.

(Anesth Analg 2003;97:534-40)

In the United States, more than 73 million surgeries are performed annually (1), and up to 75% of patients experience pain after surgery (2-4). During the past decade, because of changes to incentives in hospital payment systems, the growth of managed care, advances in medical technology, and changes in practice patterns, the site of medical care has shifted from inpatient to outpatient settings. Approximately 70% of all surgeries in the United States are now performed in an ambulatory setting (5).

Although pain is a predictable part of the postoperative experience, inadequate management of pain is common and can have profound implications. Unrelieved postoperative pain may result in clinical

and psychological changes that increase morbidity and mortality as well as costs and that decrease quality of life (6). Negative clinical outcomes resulting from ineffective postoperative pain management include deep vein thrombosis, pulmonary embolism, coronary ischemia, myocardial infarction, pneumonia, poor wound healing, insomnia, and demoralization (6,7). Associated with these complications are economic and medical implications, such as extended lengths of stay, readmissions, and patient dissatisfaction with medical care (8,9). It is estimated that the economic burden of treating chronic pain that develops from acute pain in a 30-yr-old individual over a lifetime could be as much as \$1 million (10). Prevention and effective relief of acute pain may improve clinical outcomes, avoid clinical complications, save health care resources, and improve quality of life. Recognizing that some of the deleterious effects of acute pain can be avoided or minimized, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has incorporated new standards for pain management. Effective in 2001, the JCAHO requires as one condition of accreditation adequate assessment, monitoring, and

Supported in part by Pharmacia, Inc.

Accepted for publication March 10, 2003.

Address correspondence and reprint requests to Jeffrey L. Apfelbaum, MD, Department of Anesthesia and Critical Care, The University of Chicago Hospitals, 5841 S. Maryland Ave., MC 4028, Chicago, IL 60637. Address e-mail to j-apfelbaum@uchicago.edu.

DOI: 10.1213/01.ANE.0000068822.10113.9E

treatment of pain (11). Pain management must become part of all patient care activities.

The Agency for Health Care Policy and Research issued guidelines for acute pain management in 1992 (12,13). The guidelines promote aggressive treatment of acute pain and educate patients about the need to communicate unrelieved pain. In 1995, the American Society of Anesthesiologists published guidelines for acute pain management in the perioperative setting (8). These guidelines promote standardization of procedures and the use of patient-controlled analgesia pumps, epidurals, and multimodal analgesia. They also recommend that proactive planning—including obtaining pain history and preoperative, intraoperative, and postoperative pain treatment—be a part of the institution's interdisciplinary care plan.

Pain management guidelines appear to have had little influence on practice patterns or on improved pain control for patients. In a study conducted 1 yr after the introduction of the Agency for Health Care Policy and Research guidelines, Warfield and Kahn (4) found that the incidence and severity of postoperative pain was high. Three of four patients in their study reported experiencing pain after surgery, and 80% of these patients rated pain after surgery as moderate to extreme. The analysis in the study was somewhat limited because inpatients and outpatients were grouped together without factoring in the differences between the two patient settings. Similarly, assessments of pain levels taken before and after discharge were analyzed together, even though levels of pain are known to differ between these time periods.

Since the Warfield and Kahn study (4), newer protocols for patient-controlled analgesia and regional analgesia have been developed, and minimally invasive surgical techniques, such as endoscopic procedures, are used more frequently. These changes in practice patterns could affect the management of postoperative pain and patient attitudes about pain. An understanding of the postoperative pain experience from a patient's perspective is important if health care professionals are to identify ways to improve care. The objective of this study was to characterize the postoperative pain experience, assess patient satisfaction with pain medications, evaluate the success of patient education, and assess patient perceptions about postoperative pain and pain medications.

Methods

The list of potential subjects was obtained from National Family Opinion-WorldGroup, a market research organization that maintains a panel of >550,000 households for use exclusively in market research studies. The initial sample was randomly selected from the universe of panel households via a

computer program and was designed to be representative of the US population; it was based on US census information in terms of geography, age of household head, household income, household size, and market size. From this randomly selected sample, respondents were contacted systematically to ensure that each person within the sample had an approximately equal opportunity to participate in the study. Adults who had surgery within the last 5 yr were eligible for participation in the study. A total of 666 adults were contacted to obtain a prespecified 250 eligible patients for this study, and all participants gave their consent. This sample size was based on a similar survey reported in the literature (4), and patients were not paid for their participation. The interviewers asked a predetermined list of questions about postoperative pain management.

The predetermined questions, which were written in lay language and modified from a survey used previously (4), asked about the postoperative pain experience. Participants were asked how long ago their procedures had been performed, in what type of facility, and what their concerns were before surgery. Patients also were asked about the presence and severity of pain (verbal categorical scale), the medications received, adverse effects, and satisfaction with pain medications after surgery while they were still in the hospital and up to 2 wk after discharge. They were asked whether they had received pain management education and were asked to describe their perceptions of pain and pain medications after surgery. The questionnaire focused on major events and experiences that patients could reliably recall.

Data were stratified according to surgical setting. Results from patients who had surgery in a doctor's office, outpatient clinic, or freestanding surgery center were combined with results from patients who had surgery as outpatients in the hospital setting. Percentages were calculated on the basis of the total number of patients who answered each question. Data were analyzed with descriptive statistics.

Results

A total of 666 adults were screened to obtain 250 eligible patients (38%) for this study. There were no differences between screened patients ($n = 666$) and study-eligible patients ($n = 250$) with regard to geographic region, age, income, or household size. Most patients who participated in this study were women (65%) with a median age of 46 yr (Table 1). More than half of the patients had inpatient surgery, compared with 38% of patients who had outpatient surgery. Data from the remaining 10% of patients whose surgical procedures had been performed in a doctor's office, an outpatient clinic, or a freestanding surgery

Table 1. Demographics of Survey Respondents

Variable	Inpatient (n = 129)	Outpatient (n = 121) ^a	Total (n = 250)
Age (yr)			
18-39	28%	31%	29%
40-54	33%	46%	38%
≥55	39%	23%	31%
Sex			
Male	39%	31%	35%
Female	61%	69%	65%
Location of surgery			
Inpatient	—	—	52%
Outpatient	—	—	38%
Other	—	—	10%
Time since surgery (yr)			
≤1	40%	60%	50%
2-3	36%	35%	36%
4-5	23%	5%	14%
Health insurance			
Managed care	63%	66%	65%
Indemnity plan	13%	15%	14%
Medicaid	3%	4%	4%
Medicare	14%	7%	11%
Blue Cross/Blue Shield	2%	2%	2%
Other	4%	3%	2%
None	1%	3%	2%

^a Includes outpatients in hospitals, doctor's offices, outpatient clinics, and freestanding surgery centers.

center were combined with the data from hospital-based outpatients. At the time of the survey, 60% of outpatients had had surgery less than 1 yr previously, and 5% had had surgery between 4 and 5 years ago. For inpatients, the values were 40% and 23%, respectively.

Patients were most concerned about pain after surgery (59%) and whether the surgery would actually improve their condition (51%) (Table 2). When data were stratified by sex, female patients were still most concerned about pain after surgery (60%); however, men indicated improvement of their condition post-surgery (57%) as their most common concern, with pain postsurgery (56%) and full recovery from surgery (56%) following closely thereafter. The second next most common female response was improvement of their condition postsurgery, with 47% of women indicating this as a concern. Other concerns included pain during surgery, recovery after surgery, and whether or not health care professionals would be responsive and sensitive to their medical needs.

Overall, 82% of patients reported that they had experienced some pain from the period after surgery until 2 wk after discharge (Table 3). Of these patients, 47% experienced moderate pain and 39% experienced severe to extreme pain (Table 3) at some time during their postsurgical recovery period. A larger proportion of inpatients experienced severe to extreme pain than did outpatients. Also, a larger proportion of female patients reported experiencing pain after surgery

(female 60% versus male 55%). To evaluate potential recall bias, Table 4 compares the proportion and level of postsurgical pain in patients who had surgery within the last year and those who had surgery between 2 and 5 yr previously. A similar proportion of patients reported either severe or extreme pain if the surgery had been performed within the last year compared with patients who had surgery more than 1 yr previously (38% vs 42%, respectively). If levels of "extreme" pain were examined, a slightly larger proportion of patients experienced extreme pain in the ≤1 year category than the more than 1 yr category (22% vs 15%).

Overall, proportionately more patients experienced pain after discharge (from the hospital or physician office) than before discharge. Approximately 75% of patients reported pain after discharge, compared with 58% of patients who reported pain before discharge. Almost half of all patients experienced severe to extreme pain before discharge. After discharge, the percentage of patients who experienced severe pain was relatively unchanged, but the percentage of patients who experienced extreme pain was substantially reduced.

Approximately 82% of all patients received pain medications in the hospital, doctor's office, outpatient clinic, or surgery center. The most commonly administered medications were morphine (33%) and meperidine (27%) for inpatients and acetaminophen with codeine (23%) and ibuprofen (15%) for outpatients. Overall, one third of patients requested their first one to two doses of pain medication while in the surgical setting. Of these, 37% were inpatients and 25% were outpatients. After discharge, 76% of all patients received pain medications. The most frequently prescribed medications were acetaminophen with codeine (17%) or acetaminophen alone (17%) for inpatients and acetaminophen with codeine (21%) or oxycodone with acetaminophen (20%) for outpatients.

Of the patients who received pain medications, 23% reported experiencing adverse effects (Table 5). In the hospital, doctor's office, outpatient clinic, or surgery center, 15% experienced adverse effects; 17% of patients experienced adverse effects after discharge. The most common side effects were drowsiness, nausea, and constipation.

When patients who received pain medications before discharge were asked about satisfaction with their medications, 88% of them reported that they were either "very satisfied" or "satisfied" (Table 6). Despite reporting intense pain, only 3% of patients were "dissatisfied" or "very dissatisfied" with pain medications. A similar trend was noted for surgical inpatients and outpatients; however, outpatients were slightly less satisfied. Approximately 90% of inpatients and 85% of outpatients were satisfied with their pain medications, compared with only 2% of inpatients and 4%

Table 2. Patient Concerns Before Undergoing Surgery

Concern ^a	Inpatient (n = 129)	Outpatient (n = 121)	Total (n = 250)
Pain after surgery	57%	61%	59%
Whether surgery would improve condition	47%	55%	51%
Full recovery from surgery	50%	41%	46%
Pain during surgery	36%	30%	33%
Treatment by health care professionals	32%	27%	30%
Don't know/refused	19%	12%	16%

^a Patients could choose more than one concern.

Table 3. Presence of Pain and Most Intense Pain Experienced

Variable	Any pain	Slight pain	Moderate pain	Severe pain	Extreme pain
Overall pain ^a					
Total	82%	13%	47%	21%	18%
Inpatient	86%	10%	43%	24%	23%
Outpatient	79%	17%	52%	18%	14%
Pain before discharge					
Total	58%	14%	43%	23%	21%
Inpatient	73%	12%	40%	23%	25%
Outpatient	43%	18%	47%	22%	14%
Pain after discharge					
Total	75%	20%	52%	21%	8%
Inpatient	78%	19%	52%	22%	7%
Outpatient	71%	20%	52%	19%	9%

Percentages for individual pain levels are based on the number of patients experiencing any pain. Total patients = 250, inpatients = 129, outpatients = 121.
^a Overall pain experienced in the period after surgery until 2 wk after discharge.

Table 4. Pain Experience of Patients with Surgery Within the Last Year and Longer Than One Year

Pain experience	Time since surgery ≤1 yr (n = 125)	Time since surgery 2-5 yr (n = 125)
Any pain	101 (80%)	105 (84%)
Worst pain experienced		
Slight pain	19 (19%)	8 (8%)
Moderate pain	44 (44%)	53 (51%)
Severe pain	16 (16%)	28 (27%)
Extreme pain	22 (22%)	16 (15%)

of outpatients who were dissatisfied with their pain medications. The percentage of patients reporting "very satisfied" or "satisfied" was 90% in the inpatient group, compared with 84% in the outpatient surgical group while in the hospital or outpatient surgical center. The rates for patients postdischarge home (up to 2 wk) were 87% vs 76%, respectively.

When patients were asked about their satisfaction with pain medications during the first 2 wk after discharge, 83% reported being "very satisfied" or "satisfied," 10% "slightly satisfied," 3% "slightly dissatisfied," and 4% "dissatisfied" or "very dissatisfied" (Table 6). After discharge, patients who had outpatient surgery were slightly less satisfied with their pain medication than were patients who had inpatient surgery. Findings were similar for outpatient and inpatient surgical settings.

Approximately two thirds of patients reported that a health care professional talked with them before surgery about how their pain would be treated (Table 7). Overall, nurses were more likely than other health care professionals to educate patients about pain and pain management. Among surgical outpatients, surgeons were as likely as nurses to provide patient pain education, but nurses were more likely to provide this service for surgical inpatients. After surgery, two thirds of patients reported being asked by a health care professional about their pain, most frequently by a nurse.

When asked about attitudes regarding pain and pain medications, 75% of patients believed that it was necessary to experience some pain after surgery, and 8% of patients had postponed surgery because they were worried about the possibility of experiencing

Table 5. Adverse Effects Experienced Before and After Discharge

Side effect	Before discharge (n = 197)	After discharge (n = 184)	Overall (n = 222)
Any side effect	15%	17%	23%
Drowsiness	41%	43%	41%
Nausea	28%	33%	35%
Constipation	24%	23%	26%
Sleeplessness	14%	17%	18%
Dizziness	17%	13%	14%
Vomiting	21%	3%	14%
Abdominal discomfort	10%	7%	10%
Itching	10%	7%	10%
Mood changes	7%	7%	8%
Difficult urination	10%	3%	8%

Data are based on the number of patients receiving pain medications. The percentages for individual adverse effects are based on the number of patients experiencing any adverse effect.

Table 6. Patient Satisfaction with Pain Medication Before Surgery and After Discharge

Satisfaction with pain medication	Before surgery (in hospital)	After discharge
Very satisfied	50%	43%
Satisfied	38%	40%
Slightly satisfied	7%	10%
Slightly dissatisfied	3%	3%
Dissatisfied	3%	3%
Very dissatisfied	0%	1%

pain. Approximately 94% of patients thought that some pain medications prescribed after surgery caused adverse effects, and, if given a choice of pain relievers, 72% of patients would choose a nonnarcotic drug. The main reasons for this choice were that nonnarcotic drugs are less addictive (49%) and have fewer adverse effects (18%).

Discussion

With current standard postoperative care, approximately 80% of all patients in our survey experienced acute pain after surgery. Alarming, most of these patients had moderate, severe, or extreme pain. Both inpatients and outpatients experienced postoperative pain. Ambulatory patients experienced more pain after discharge than when they were in the facilities.

When assessing the severity and effect of pain experienced after day surgery, Beauregard et al. (14) found that 40% of patients reported moderate to severe pain during the first 24 hours after discharge. Pain decreased over time but was severe enough to interfere with daily activities, even several days after surgery. Chung et al. (15) found that >25% of ambulatory patients reported experiencing moderate to severe pain after discharge. Another study, conducted by Lynch et al. (16), used a 1–10 numerical rating scale to assess the severity of pain among patients who had

noncardiac inpatient surgery. The mean maximum pain score on postoperative Day 1 was 6.3 (moderate pain) and decreased only slightly to 5.6 by postoperative Day 3. The findings demonstrated that patients experienced intense pain after inpatient and outpatient surgery, which is consistent with the findings from our study.

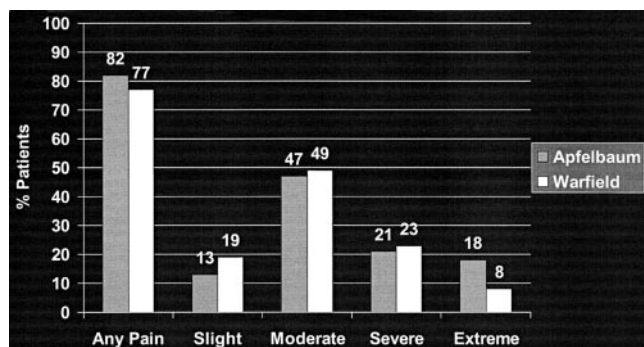
A national study similar to ours assessed the status of acute pain management and attitudes toward postoperative pain in a random sample of patients (4). Although this study was performed approximately a decade ago, it provided a baseline against which later studies could be compared to assess improvement in pain management. In this study of 500 patients, 77% experienced pain after surgery, 23% experienced severe pain, and 8% experienced extreme pain. Similarly, we found that 82% of patients experienced pain after surgery: 21% of patients experienced severe pain, and 18% of patients experienced extreme pain. The percentage of patients with overall pain increased slightly in our study; however, the percentage of patients with extreme pain more than doubled as compared with the results from Warfield and Kahn (4) (Fig. 1). Patients seem just as concerned about experiencing postoperative pain today (59%) as they were almost a decade ago.

Adverse effects can occur after pain medications. Of those patients who received analgesia, 23% experienced adverse effects in our study, which was similar to the results reported by Warfield and Kahn (4). Interestingly, almost 90% of these patients reported satisfaction with their pain medications. This finding is similar to results in studies that focused on overall pain management rather than specific satisfaction with the actual pain medication. This could be related to patients' expectation of postoperative pain and little awareness of the efficacy of current analgesics (17,18). Satisfaction with pain care is also challenging to understand because patients often base their response on

Table 7. Patient Education on Pain Management

Variable	Any education	Nurses	Surgeons	Anesthesiologist	Other physician
Before surgery					
Total (<i>n</i> = 250)	63%	42%	38%	18%	20%
Inpatient (<i>n</i> = 129)	63%	37%	30%	22%	24%
Outpatient (<i>n</i> = 121)	63%	48%	47%	15%	15%
After surgery					
Total (<i>n</i> = 250)	66%	56%	28%	2%	33%
Inpatient (<i>n</i> = 129)	70%	60%	26%	3%	38%
Outpatient (<i>n</i> = 121)	61%	50%	29%	0%	28%

Percentages are based on the number of patients receiving any education.

**Figure 1.** Overall pain after surgery.

sympathetic reactions and friendliness of staff rather than the outcomes of pain relief.

We were surprised to find that more than half of the patients surveyed were concerned about experiencing pain after surgery and that this caused some of them even to postpone surgery. Although most patients claimed to receive preoperative education on postoperative pain management, our findings suggest that a patient's real concern is not adequately addressed. Despite the increased focus on pain management over the last several years and the development of formal standards and guidelines for the management of acute pain, a significant number of patients continue to experience unacceptable levels of pain after surgery and after discharge. This fact is alarming, considering the trend toward ambulatory surgery and shorter hospital stays. Aggressive management could prevent complications that result from postoperative pain. The intense pain experienced after surgery and side effects from pain medications may explain why patients continue to fear postoperative pain.

Guidelines have been designed to improve treatment outcomes for patients with acute pain. In 1995, the American Pain Society's Quality of Care Committee published a set of guidelines recommending quality improvement programs for acute pain, which include five key elements: 1) recognition and prompt treatment of pain, 2) provision to clinicians of information about analgesics, 3) promise to patients of

attentive analgesic care, 4) implementation of policies for using modern analgesic technologies, and 5) assessment and continuous improvement of pain management (19). Such recommendations have the potential to improve patient satisfaction with medical care and remove some of the obstacles to optimally manage pain. However, as the results of this study show, postoperative pain is still not adequately managed. Recognizing the importance of the issue of undertreatment of pain, the JCAHO implemented new pain standards, which require that all patients be assessed for pain and then be appropriately treated and monitored. In 1999, the National Health and Medical Research Council of Australia published evidence-based guidelines on management of all forms of severe pain (20).

Other factors also may explain the inadequate management of acute pain after surgery. The pressure to discharge patients after surgery could limit the pain medications health care professionals are willing to prescribe. In our study, inpatients had more pain and were more likely to receive morphine and meperidine before discharge than outpatients, who were more likely to receive acetaminophen with codeine or ibuprofen before discharge. Both patient groups received similar medications after discharge. Physicians may be unwilling to discharge a patient medicated with potent, long-acting opioids from a supervised setting because of potential safety concerns. Also, patients may not have someone at home who can assist them during the first 24 hours after discharge, when the pain may be greatest, adverse effects can be common, and analgesia administered at the hospital is wearing off.

Although there is still some risk, when opioids are used for a medical purpose for a short time, the risk of addiction is small (21). Fearful of the addictive potential of opioids, many patients may prefer a non-opioid or a less potent opioid medication. Also, some patients may be so distressed by the adverse effects of opioids that they may prefer to experience pain rather than opioid adverse effects. Efforts toward multimodal analgesia with the combination of opioid and non-opioid

medications, including nonsteroidal antiinflammatory drugs, cyclooxygenase-2 inhibitors, or local anesthetics, may result in more optimal pain management (22). Our findings suggest that greater awareness of the importance of managing pain and the dedication of resources to pain control are needed to improve postoperative pain management.

There are some weaknesses in this study. A retrospective survey of an event or an experience is likely to be influenced by the events occurring after the event in question, as well as by the time interval. Although many people are able to recall past events or experiences with reasonable accuracy, over long periods of time, the effect of recall bias and passage of time should be considered when interpreting a retrospective analysis. However, we believe that postoperative events are unique and significant enough that patients may be able to recall their general pain experience, even when it took place several years previously. Approximately 50% of patients who responded to this survey had had surgery within the year before the survey. In addition, these data should be interpreted in the context of 250 patients, with just slightly more female respondents (60%), because there can be some difference in pain experience between sexes. Finally, it is acknowledged that these results are based on a survey of only 250 randomly selected patients, spanning both inpatient and outpatient procedures. Nonetheless, these findings are consistent with previous reports and provide a current understanding of the potential challenges we still face in adequately managing pain.

In summary, most patients experience moderate to severe pain sometime during their postoperative recovery. The results from this study are even more relevant with the increasing attention to pain management in the hospital setting. Changes in medical practice patterns, continued research, development of newer analgesics with potent efficacy and minimal adverse effects, and use of balanced analgesia should enhance the potential to treat postoperative pain more successfully.

References

1. Fast stats. National Center for Health Statistics Web site. Available at: <http://www.cdc.gov/nchs/fastats>. Accessed May 7, 2003.
2. Schug S, Large R. Economic considerations in pain management. *Pharmacoeconomics* 1993;3:260-7.
3. Owen H, McMillan V, Rogowski D. Postoperative pain therapy: a survey of patients' expectations and their experiences. *Pain* 1990;41:303-7.
4. Warfield CA, Kahn CH. Acute pain management: programs in U.S. hospitals and experiences and attitudes among U.S adults. *Anesthesiology* 1995;83:1090-4.
5. SMG forecast of surgical volume in hospital/ambulatory settings 1994-2001. Chicago: SMG Marketing Group, Inc., 1996.
6. Carr DB, Goudas LC. Acute pain. *Lancet* 1999;353:2051-8.
7. Breivik H. Postoperative pain management: why is it difficult to show that it improves outcome? *Eur J Anaesthesiol* 1998;15:748-51.
8. Practice guidelines for acute pain management in the perioperative setting: a report by the American Society of Anesthesiologists Task Force on Pain Management, Acute Pain Section. *Anesthesiology* 1995;82:1071-81.
9. Twersky R, Fishman D, Homel P. What happens after discharge? Return hospital visits after ambulatory surgery. *Anesth Analg* 1997;84:319-24.
10. Cousins MJ, Power I, Smith G. Pain: a persistent problem. *Reg Anesth Pain Med* 2000;25:6-21.
11. Pain management standards. Joint Commission on Accreditation of Healthcare Organization Web site. Available at: <http://www.jcaho.org/accredited+organizations/hospitals/standards/revisions/index.htm>. Accessed May 7, 2003.
12. Acute pain management: operative or medical procedures and trauma. I. Agency for Health Care Policy and Research. *Clin Pharm* 1992;11:309-31.
13. Acute pain management: operative or medical procedures and trauma. II. Agency for Health Care Policy and Research. *Clin Pharm* 1992;11:391-414.
14. Beauregard L, Pomp A, Choiniere M. Severity and impact of pain after day-surgery. *Can J Anaesth* 1998;45:304-11.
15. Chung F, Ritchie E, Su J. Postoperative pain in ambulatory surgery. *Anesth Analg* 1997;85:808-16.
16. Lynch EP, Lazor MA, Gellis JE, et al. Patient experience of pain after elective noncardiac surgery. *Anesth Analg* 1997;85:117-23.
17. McNeill JA, Sherwood GD, Starck PL, Thompson CJ. Assessing clinical outcomes: patient satisfaction with pain management. *J Pain Symptom Manage* 1998;16:29-40.
18. Ward SE, Gordon D. Application of the American Pain Society quality assurance standards. *Pain* 1994;56:299-306.
19. American Pain Society Committee. Quality improvement guidelines for the treatment of acute pain and cancer pain. *JAMA* 1995;274:1874-80.
20. National Health and Medical Research Council of Australia. Acute pain management: scientific evidence. Canberra, Australia: Aus Info, 1999.
21. Cherny NI. Opioid analgesics: comparative features and prescribing guidelines. *Drug* 1995;51:713-37.
22. Jin J, Chung F. Multimodal analgesia for postoperative pain control. *J Clin Anesth* 2001;13:524-39.