

Effective Pain Management and Improvements in Patients' Outcomes and Satisfaction

Diane Glowacki, RN, MSN, CNS, CNRN-CMC

Adequate pain management is a compelling and universal requirement in health care. Despite considerable advancements, the adverse physiological and psychological implications of unmanaged pain remain substantially unresolved. Ineffective pain management can lead to a marked decrease in desirable clinical and psychological outcomes and patients' overall quality of life. Effective management of acute pain results in improved patient outcomes and increased patient satisfaction. Although research and advanced treatments in improved practice protocols have documented progressive improvements in management of acute and postoperative pain, little awareness of the effectiveness of best practices persists. Improved interventions can enhance patients' attitudes to and perceptions of pain. What a patient believes and understands about pain is critical in influencing the patient's reaction to the pain therapy provided. Use of interdisciplinary pain teams can lead to improvements in patients' pain management, pain education, outcomes, and satisfaction. (*Critical Care Nurse*. 2015;35[3]:33-43)

Effective pain management is a national and global challenge. Lack of integration of current knowledge and practice of effective pain management by health care professionals into day-to-day care adversely affects patients, resulting in unnecessary physical, psychological, and emotional manifestations.¹ Implementation of research findings on pain management has slowly evolved and led to improvements in patient care.² The Joint Commission and the World Health Organization, along with many national professional organizations and agencies, have recognized that pain management is an essential aspect of patient care.²

CE Continuing Education

This article has been designated for CE credit. A closed-book, multiple-choice examination follows this article, which tests your knowledge of the following objectives:

1. Discuss improved outcomes for effective pain management
2. Review the use of evidence-based practice in pain management and assessment
3. Describe the pathophysiology of pain and its impact on the patient

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In this article, I discuss improved outcomes due to effective pain management in patients with acute pain, highlight the dimensions of pain management, review use of recommended evidence-based practices in pain management and assessment, describe the pathophysiology of pain, update research findings on multimodal balanced analgesia, and report the increase in patient satisfaction related to effective pain management. Participation of Mercy Hospital of Buffalo, Buffalo, New York, in a National Database of Nursing Quality Indicators (NDNQI) study revealed successful methods that have positively affected nursing practice and procedural changes.

Pain has been defined as “an unpleasant physical, sensory and emotional experience associated with actual or potential tissue damage, as well as [an] unpleasant and therefore also an emotional experience.”³ According to McCaffery,⁴ “Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it does.”

Dimensions of Pain Management

Five identified dimensions contribute to pain management. The dimensions have physiological, sensory, affective or cognitive, and sociocultural components unique for each patient that should be considered.⁵ Research on pain management in the 1970s and 1980s peaked as a breakthrough in theoretical knowledge of the physiological, psychological, and social aspects of improved quality of life associated with pain relief, but application of the findings to the general practice of medicine have been delayed.⁶ Aggressive pain control is still lacking for patients with acute pain.^{5,7} Although some concepts have been integrated into practice to enhance effective pain management, application of the

concepts in the treatment of patients with pain has been slow,⁷⁻⁹ despite the availability of efficacious analgesics and multiple published clinical practice guidelines for management of acute pain.^{2,7} The American Pain Society published the most current guidelines¹⁰ in 2005 for improving the management of acute pain and cancer pain (the initial guidelines were released in 1995). The 5 most current guidelines include prompt recognition and treatment of pain, involvement of patients in the pain management plan, improvement of treatment patterns, reassessment and adjustment of the pain management plan as needed, and monitoring processes and outcomes of pain management.¹⁰

Pathophysiology

Acute pain can be due to surgery, an injury, or a pathophysiological event such as ischemia or embolus. The central nervous system (CNS) conveys signals from the spinal cord to the brain, then to the nerves, and finally throughout the body. The spinal and supraspinal components of the CNS play critical roles. Both the peripheral and the central nervous systems are involved with the perception of pain. The peripheral system includes both motor and sensory nerves. Afferent nerves receive information, or stimuli, and efferent nerves carry the sensation to the muscles and stimulate responses.¹¹

After tissue injury and the effect of physical stress on the body, the sympathetic nervous system is activated, and damaged cells trigger a cascade of changes in the peripheral and central systems, releasing chemical mediators such as catecholamines, cytokines, and inflammatory markers at the cellular level, causing further tissue damage.^{7,12} The signals from these peripheral neurotransmitters intensify the noxious process. The signals travel through afferent pathways to the dorsal horn of the spinal cord, reach the subcortical and cortical areas of the brain, which play a role in the transmission of pain centrally through the spinal cord, and thus provoke pain¹³ (Table 1). At the cellular level, this series of events results in vasodilatation, increased vascular permeability, and activation of inflammatory cells that affect cardiovascular, gastrointestinal, renal, endocrine, respiratory, and metabolic functions and cause suppression of the immune system, which can result in postoperative infections and delayed healing.^{2,6} The potential for depression and anxiety also often occurs with mismanaged pain.⁶

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Table 1 The pain pathway and analgesic interventions that can modulate activity at each point of the central and the peripheral nervous systems^a

Progression of events	Pharmacological interventions
Injury or trauma <i>leads to</i>	
Peripheral nociceptor stimulation and release of noxious neurotransmitters <i>leads to</i>	Local anesthetics Traditional nonsteroidal anti-inflammatory drugs Cyclooxygenase-2 inhibitors
Peripheral nerves travel through ascending or afferent central nervous system pathway <i>leads to</i>	Local anesthetics
Signal reaches dorsal root ganglion, which has synapses in the dorsal horn of the spinal cord Signal travels along the spinothalamic tract to the thalamus and cortex <i>leads to</i>	Local anesthetics Opioids α -Agonists Cyclooxygenase-2-specific inhibitors
Pain	Centrally acting analgesics

^a Based on information from Gottschalk and Smith.¹³

Patients' Outcomes

Adequate pain management enhances earlier mobility and lessens the complications of ileus, urinary retention, and myocardial infarction. Sleep deprivation, which can increase postoperative fatigue, resulting in decreased mobility, is also reduced, as are pulmonary complications, and an aggravated catabolic hormonal response to injury.^{14,15} When physiological complications are better controlled, patients and their families are better able to respond to stress and to cope with the patient's situation.^{2,6} Additional benefits of adequate pain management include decreased length of stay, lower readmission rates, earlier overall recovery,¹⁶ improved quality of life, increased productivity, and decreased costs for patients and the health care system.^{14,17}

During the early 2000s, the dissemination of research, science, and evidence-based practice was slowly embraced by clinicians, even though the literature had long described available pain interventions and methods to reduce potential pain.¹ The American Pain Society developed one of the first national quality improvement programs in which the emphasis shifted from improved delivery of effective pain management to measurable patient outcomes, such as decreased length of stay, reduced hospital costs, and increased patient satisfaction.¹¹

Lack of pain education provided to patients about preoperative and postoperative surgical procedures and expectations can result in poorer outcomes for the

patients. Egbert et al¹⁸ reported that providing pain education to preoperative and postoperative patients resulted in significant improvements in the patients' outcomes. Patients who received pain education required 50% fewer narcotics during hospitalization, excluding the day of the procedure, and were discharged sooner than were patients who did not receive the education. When acute pain is predictable, providing effective pain education and information on the anticipated postoperative experience should include special regard to the multiple causes and effects of pain, along with the range of treatments available to a patient. This pain education can reduce patients' distress, reduce the number of signs and symptoms, and improve functional status.³ What a patient believes and understands about pain is critical in influencing the reaction to the pain therapy provided.¹² Pain education alone may be the most effective treatment provided by health care professionals.³

The clinical practice guidelines of the American Pain Society recommend that patients and their families receive pain education during the presurgical visit that includes an explanation of the surgical procedure; the expected postoperative routine; the interventions and options for pain relief, including available pain medication; and the need for progressive increased mobility. Proper education and adequate treatment of postoperative pain can also result in positive emotional outcomes for patients, such as a decrease in anxiety and depression,

an increase in coping skills, a greater sense of individual control, and an increase in a sense of well-being.^{6,18}

Improvement of Pain Assessments

Lack of proficient and uniform pain assessment is one of the most challenging barriers in achieving adequate pain control.^{6,19} The most acknowledged and recognized barrier to effective pain assessment is patients' subjectivity, the individual, personal, and private experiences within the dimensions of pain management. Assessment of a patient's pain requires that professionals become well educated in recognizing a patient's perception of pain, previous experiences with pain, current knowledge of pain, spiritual and religious beliefs, and sociocultural components.^{2,5} A thorough pain history and shared goal setting are critical components of effective pain management that leads to beneficial outcomes.⁶ Synergistic concepts of pain assessments are complex and include assessment of a patient's clinical status, pain history, age, body weight, comorbid conditions, psychological status, previous exposure to analgesic medication, opioid-naïve status (an opioid-naïve patient is one who has not previously received opioid drugs and now, often because of trauma or surgery, receives regular daily doses of opioids), and insight into the patient's current treatments for pain, along with the specific type of surgery the patient will undergo.⁹

Pain assessment is only the first step in effective pain management; what is done with that information can make a marked difference for a patient.³ The measurement and treatment of pain must be appropriate for

A thorough pain history and shared goal setting are critical components of effective pain management that leads to beneficial outcomes.

each patient.¹⁸ The outcome of each patient's pain experiences varies

according to the risks and benefits associated with different analgesics administered. Different treatment approaches should guide each patient's pain therapy without relying on pain scales alone.²⁰

Use of a patient's self-report has typically prevailed as the major component of a comprehensive pain assessment and is most commonly performed by using a numeric rating scale.²¹ Although no single, universally accepted metric pain assessment tool is available,³ Breivik et al⁹ found that a numeric rating scale and a visual analogue scale were equally sensitive in clinical

assessments of pain and were better than other pain scales. The American Board of Family Medicine and the Institute of Medicine identified the numeric rating scale as a reasonable tool for pain screening,²¹ consistent with previous findings. However, opportunities still exist to devise a pain tool to better tease out information on the quality and character of a patient's pain experience.

Improved pain assessments can help nurses prevent analgesia gaps, or lapses in administration of pain medication, that can increase pain or even lead to uncontrolled pain.⁵ Analgesia gaps can occur while a patient is emerging from anesthesia, being transferred from a postanesthesia care unit to a surgical unit, having the route of administration changed from epidural to intravenous to oral, and during progression in mobility. By astutely identifying anticipated postoperative phases that might require additional analgesia during a patient's acute recovery, nurses can avoid interruptions in pain therapies.⁷ Principles of analgesic management include using fixed doses of scheduled analgesics when continuous pain is anticipated rather than solely using medications for breakthrough pain. Modifications to administration of analgesics depend on an accurate pain assessment, including pain intensity, pain relief, and side effects, such as nausea and vomiting, lightheadedness, dizziness, and urinary retention, and use of adjuvant medications such as nonsteroidal anti-inflammatory drugs.^{8,22} Assessment of the intensity of acute postoperative pain at rest is as important as pain assessment during subsequent postoperative activity. Assessing pain only at rest will not provide the critical information necessary to determine effective pain management.

Balanced Analgesia

The concept of multimodal analgesia was introduced in the early 1990s and is currently established in clinical practice. However, this type of analgesia is not used as widely as it could be.²² A continuing increase in the knowledge base of pain management has led to the concept of multimodal pharmacology or balanced analgesia.^{8,23} Balanced analgesia incorporates the combination of multiple analgesics that result in synergistic effects (Table 2). Postoperative pain management targets various physiological pain pathways and mechanisms of action, allowing for enhanced analgesia.

Pharmacological adjuvants such as ibuprofen, acetaminophen, naproxyn, ketorolac, gabapentin,

Table 2 Examples of multimodal analgesic drugs used in the postoperative period^a

Acetaminophen
Nonsteroidal anti-inflammatory drugs
Glucocorticoids
Strong opioid agonists (eg, morphine, hydromorphone, fentanyl)
Weak opioid agonists (eg, oxycodone, hydrocodone, tramadol)
Local anesthetic wound infiltration
Local anesthetic wound infusion
Continuous peripheral nerve block
Continuous epidural nerve block
Continuous paravertebral block
Transdermal analgesic patches (eg, fentanyl, lidocaine)

^aBased on information from White and Kehlet.⁹

pregabalin, and local anesthetics alone often have inadequate potency for effective pain management. Opioid analgesics continue to be the primary medications for managing pain in hospitalized patients.²³ Opiate drugs act primarily on the CNS, blocking the transfer of pain signals from the spinal cord to the brain.¹¹ However, adverse side effects of excessive opioid therapy can hinder a patient's recovery, especially in the early ambulation phase of postoperative care. Unintended progressive sedation and respiratory depression are 2 of the most critical side effects with aggressive opioid analgesia and are significantly correlated with increased mortality.^{14,17,23,24} The American Society of Anesthesiologists Task Force 2012 recommends that clinicians include a medication regimen of around-the-clock therapy with combinations of drugs for 24 to 48 hours after surgery.^{22,25} The multimodal approach to pain management has been an inspiring success in the research for patients' comfort postoperatively.²⁶

Further recommendations include the establishment of interdisciplinary teams who can monitor current pain practices, identify areas for improvement, delineate and define quality improvement plans, and have clear lines of responsibility.⁶ These teams are essential for successful pain management programs. Recommended members of an interdisciplinary team include personnel from anesthesiology, surgery, postanesthesia care, nursing, pharmacy, and physiotherapy.⁸

Research by Carr and Goudas¹⁷ suggests that providing effective analgesia in the early postoperative period leads to clinically important benefits, including improved long-term recovery and a decreased incidence of chronic pain. The results of Sinatra²⁷ further support the findings that analgesic regimens of multimodal therapies reduce the incidence of chronic pain. If chronic pain develops, it can become a disease of its own through atypical activity of the CNS, with effects such as immune system impairment, increased susceptibility to disease, and maladaptive psychological, family, and social consequences.²⁸ Progression of chronic pain redirects treatment approaches to focusing on the malfunctioning nervous system altogether or a "mechanism-based therapeutic approach" rather than strictly a "symptom-based approach."³ According to *Relieving Pain in America*,³ progress has been made in identifying the pathophysiological mechanisms of acute and chronic pain, but this knowledge has not resulted in the development of newer analgesic medications with improved efficiency, safety, and patients' tolerance.

Provider Education

In a column in *USA Today*, Pho²⁹ wrote that according to the American Society of Interventional Pain Physicians, 80% to 90% of physicians have had no formal training in prescribing controlled substances, and only 5 of the 133 medical schools in the United States have required courses on pain management. According to *Relieving Pain in America*,³ medical schools' training in knowledge of pain management is not well assimilated into medical practice, and the care of pain in patients is delayed and inadequate. The average teaching time in training students about pain management in US medical schools has ranged from 1 to 31 hours.³ The Institute of Medicine has recommended courses to enhance better understanding of pain assessment and management strategies in hopes of increasing the number of health care professionals with expertise in pain care.³⁰

The American Nurse Credentialing Center³¹ reported that as of 2013, only 1672 registered nurses in the United States were certified in pain management. The Nurse Practitioner Healthcare Foundation has suggested development of a standardized curriculum in pain management and better training in the knowledge of prescribing opioids for patients with acute pain.³ Nurse practitioners most likely will have an increasingly

important role in the future of pain management because most pain care is the responsibility of primary care physicians and too few of these physicians exist to carry the burden.

Patients' Satisfaction and Implications

In 2001, the Joint Commission instituted requirements that focused on improvements in quality pain management, emphasizing that pain should be proficiently assessed and treated in all patients. The commission established that acute pain and chronic pain were major causes of patients' dissatisfaction in the US health care system.⁵ Wolosin et al³² suggest that scores for overall patient satisfaction on the Hospital Consumers Assessment of Healthcare Providers and Systems (HCAHPS) survey would most likely increase the most with improvements in nursing care such as managing nurse workloads and providing nurses more time for personalized patient care that would enhance pain management.

The Centers for Medicare and Medicaid's value-based purchasing program, or pay for performance, published in 2012, instituted payment reforms that included financial incentives for hospitals that showed higher patient satisfaction scores.³³ The required focus of hospitals was to identify specific outcomes and quality of patient care and incorporate evidence-based practices.³³ Hospitals were mandated to participate in federal and public reporting to qualify for full payment based on scores on the HCAHPS survey.³³ Patient satisfaction translates into increased pay for performance; thus hospitals will not only have additional incentives for improving

Proper pain education and adequate treatment of postoperative pain can result in positive emotional outcomes.

patient satisfaction, but ultimately will have no other options

but to develop improved patient satisfaction processes. The objectives of the Centers for Medicare and Medicaid included the recognition of patients' rights to pain relief and development of policies to educate patients and patients' families specifically about efficacious pain management.³² Patients' perspectives of management of signs and symptoms and functionality have been the strongest in association with patients' satisfaction.³⁴ Patients are more likely to experience dissatisfaction if they perceive a lack of validation in their pain experience or negative attitudes from their clinicians.³

NDNQI Study

An NDNQI pain study, Coordinating Center for Dissemination and Implementation of Evidence-Based Methods to Measure and Improve Pain Outcomes, was initiated in March 2011. The goal of the study was to implement and evaluate a research program that would measure and improve pain care processes and outcomes from a sample of hospitals nationwide.³⁵ The overall goals were to evaluate the impact of implemented pain quality indicators, assess the effect of implemented strategies, and evaluate the barriers in measuring and improving pain management at the level of medical-surgical units.³⁵ A total of 400 hundred hospitals in the United States participated in phase 1 of the study, which began in March 2011 and included administration of the survey/questionnaire to patients in the 400 hospitals.

At Mercy Hospital of Buffalo, distribution of the survey/questionnaire prepared by the NDNQI and approved by the hospital institutional review board was administered to the patients by trained registered nurses. As a result, the hospital was invited to participate in phase 2 of the study. For phase 2, only 2 of the medical-surgical or telemetry units were included, as selected by the NDNQI. Phase 2 began in August 2011 and ended in December 2011 and was devoted to developing strategic problem-solving initiatives. An interdisciplinary team was formed that included a clinical nurse specialist, a nurse manager, a pharmacist, and 4 registered nurses on staff. The action plan created by the team identified 3 objectives: provide staff education with evidence-based best practice of pain management, distribute pain folders to the patients that included pain education material, and provide daily pain rounds for all patients. The team members for pain rounds consisted of the clinical nurse specialist, the nurse manager, a pharmacist, and the primary registered nurse on staff. The data reported from the NDNQI linked the team's initiatives with improved pain management and increased patient satisfaction. Publication of site-specific data of the national comparative data findings by the NDNQI was not allowed; however, the data are presented in the *NDNQI Nursing Quality News*.³⁶

The direct results of the NDNQI study prefaced the development of a hospital-wide interdisciplinary pain team at Mercy Hospital of Buffalo that implemented the successful initiatives from the study. This team

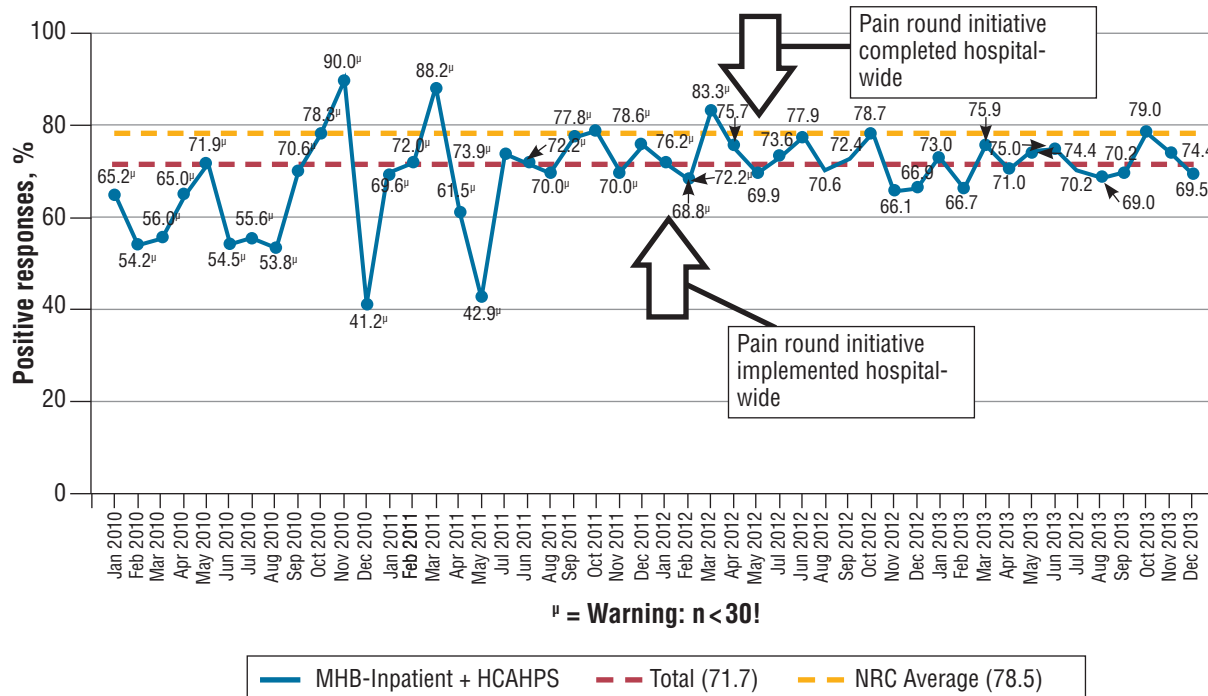


Figure 1 Patients' satisfaction scores (percentage of positive responses) overall to the survey (HCAHPS) question "Did everything to help your pain." Running chart depicts onset of National Database of Nursing Quality Indicators pain study with implementation of interdisciplinary daily patient pain rounds. Administration of the prestudy pain satisfaction survey started in March 2011. Daily pain rounds were implemented on 1 patient care unit in October 2011. Daily pain rounds were implemented on all patient care units (except maternal child and critical care units) in May 2012.

Abbreviations: HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems; MHB, Mercy Hospital of Buffalo, Buffalo, New York; NRC, National Resource Corporation.
Source: NRC Picker eReports.³⁶

consisted of the clinical nurse specialist, a nurse manager, a pharmacist, and the primary registered nurse in partnership with the physician, nurse practitioners, and physician assistants. The initiatives were implemented January 2012 through May 2012. The initiative of daily pain rounds included assessing each patient's pain and providing pain education to the patient and staff. Patient experience scores related to pain management of the National Resource Corporation³⁷ were used to analyze the hospital's data. The results strongly linked the team's initiatives with improved pain management and a continuance of increased improvement in patient satisfaction scores after the completion of the study in May 2012 (Figures 1 and 2). Both nursing and pharmacy practices have changed as a result of the NDNQI study on evidence-based practice. Daily pain rounds led to significantly improved patient outcomes, improved pain

management methods, and improved patient satisfaction. Increased engagement of physicians with pharmacists and nurses also resulted in a sustained team approach in providing effective pain management for the patients.

Conclusion

Disparities in treating pain continue. A major challenge in providing patients the most effective treatments for pain lies in the difficulty of translating research to practice. Examples of barriers include developing new analgesics, applying evidence-based approaches in practice, and the integration of interdisciplinary team approaches. Research³⁸ indicates a persistent gap between an understanding of the pathology of pain and recommended treatment of pain.

Pain relief has been acknowledged as a basic human right by the World Health Organization³⁸: "The

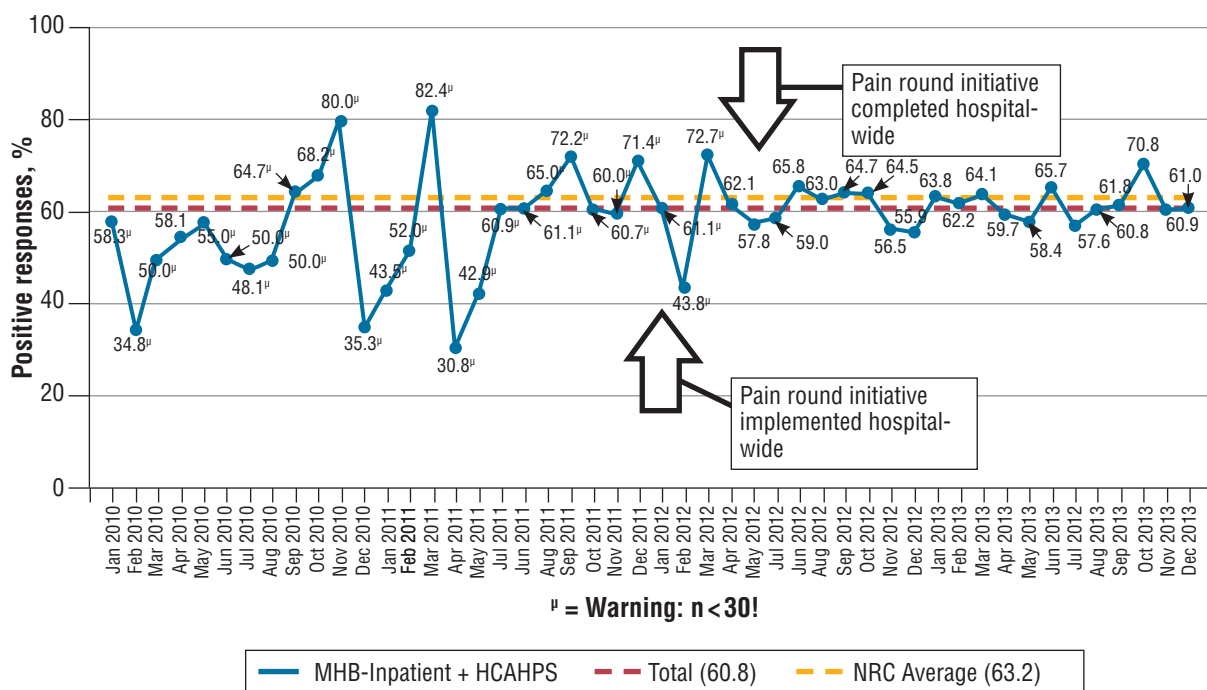


Figure 2 Patients' satisfaction scores (percentage of positive responses) overall to the survey (HCAHPS) question "Pain well controlled during stay." Running chart depicts onset of National Database of Nursing Quality Indicators pain study with implementation of interdisciplinary daily patient pain rounds. Administration of the prestudy pain satisfaction survey started in March 2011. Daily pain rounds were implemented on 1 patient care unit in October 2011. Daily pain rounds were implemented on all patient care units (except maternal child and critical care units) in May 2012.

Abbreviations: HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems; MHB, Mercy Hospital of Buffalo, Buffalo, New York; NRC, National Resource Corporation.

Source: NRC Picker eReports.³⁶

unreasonable failure to treat pain is viewed as an unethical breach of human rights." Notable progressive innovations have occurred in some medical practice models, focusing attention on the need for more research, such as research on the development of newer pain medication agents with fewer adverse side effects and aggressive implementation of balanced analgesia. The interdisciplinary team approach in pain management is a complex yet fundamental part of providing excellence in patient care. The team approach provides important insight for patients and is highly correlated with improved patient recovery, outcomes, knowledge, and satisfaction. **CCN**

Financial Disclosures
None reported.

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To learn more about pain management, read "Critical Care Nurses' Pain Assessment and Management Practices: A Survey in Canada" by Rose et al in the *American Journal of Critical Care*, July 2012;21:251-259. Available at www.ajconline.org.

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Facts

Adequate pain management is a compelling and universal requirement in health care. Ineffective pain management can lead to a marked decrease in desirable clinical and psychological outcomes and patients' overall quality of life. Improved interventions can enhance patients' attitudes to and perceptions of pain.

- Lack of pain education provided to patients about surgical procedures and expectations can result in poorer outcomes. When acute pain is predictable, providing effective pain education on the anticipated postoperative experience should include special regard to the multiple causes and effects of pain, along with the range of treatments available to a patient. This pain education can reduce patients' distress, reduce the number of signs and symptoms, and improve functional status.
- The clinical practice guidelines of the American Pain Society recommend that patients and their families receive pain education during the presurgical visit that includes an explanation of the surgical procedure; the expected postoperative routine; the interventions and options for pain relief, including available pain medication; and the need for progressive increased mobility.
- Proper education and adequate treatment of postoperative pain can also result in positive emotional outcomes for patients, such as a decrease in anxiety and depression, an increase in coping skills, a greater sense of individual control, and an increase in a sense of well-being.
- Assessment of a patient's pain requires that professionals become well educated in recognizing a patient's perception of pain, previous experiences

with pain, current knowledge of pain, spiritual and religious beliefs, and sociocultural components.

- Synergistic concepts of pain assessments include assessment of a patient's clinical status, pain history, age, body weight, comorbid conditions, psychological status, previous exposure to analgesic medication, opioid-naïve status, and insight into the patient's current treatments for pain, along with the specific type of surgery the patient will undergo.
- Use of a patient's self-report has typically prevailed as the major component of a comprehensive pain assessment and is most commonly performed by using a numeric rating scale.
- A continuing increase in the knowledge base of pain management has led to the concept of multimodal pharmacology or balanced analgesia, which incorporates the combination of multiple analgesics that result in synergistic effects.
- Pharmacological adjuvants such as ibuprofen, acetaminophen, naproxyn, ketorolac, gabapentin, pregabalin, and local anesthetics alone often have inadequate potency for effective pain management. Opioid analgesics continue to be the primary medications for managing pain in hospitalized patients.
- Further recommendations for successful pain management programs include interdisciplinary teams who can monitor current pain practices, identify areas for improvement, define quality improvement plans, and have clear lines of responsibility. Recommended members of an interdisciplinary team include personnel from anesthesiology, surgery, postanesthesia care, nursing, pharmacy, and physiotherapy. **CCN**

Glowacki D. Effective pain management and improvements in patients' outcomes and satisfaction. *Critical Care Nurse*. 2015;35(3):33-43.