

Acute Perioperative Pain Management of the Orthopaedic Patient

Guidance for Operationalizing Evidence Into Practice

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Orthopaedic surgery often results in pain, with less than half of patients reporting adequate relief. Unrelieved acute pain occurring after surgery increases the risk of negative sequelae, including delayed healing, increased morbidity, pulmonary complications, limited rehabilitation participation, anxiety, depression, increased length of stay, prolonged duration of opioid use, and the development of chronic pain. Interventions that are individualized, evidence-informed, and applied within an ethical framework improve healthcare delivery for patients, clinicians, and healthcare organizations. Recommendations for using the principles of effective pain management from preoperative assessment through discharge are detailed, including recommendations for addressing barriers and challenges in applying these principles into clinical practice.

Significance

BACKGROUND

The National Association of Orthopaedic Nurses and the American Society for Pain Management Nursing (ASPMN) collaborated in the development of a shared position statement for nurses titled “Acute Perioperative Pain Management Among Patients Undergoing Orthopaedic Surgery” (Arkin et al., 2022). This position article provided evidence-informed guidance for nurses caring for patients undergoing elective orthopaedic procedures. Many of these principles also apply to non-nurse caregivers, and to nonelective or trauma situations. This manuscript will provide guidance on how to operationalize these concepts in clinical practice.

Patients undergoing elective orthopaedic surgery may experience pain that is acute, chronic, or a combination of the two, with less than half of all surgical patients reporting adequate pain relief (Chou et al., 2016a, 2016b). Regardless of the type, it is imperative to appropriately and optimally manage postoperative pain. Unrelieved acute pain can result in many negative sequelae, including delayed healing, increased morbidity, pulmonary complications, limited rehabilitation participation, anxiety, depression, increased length of stay, prolonged duration of opioid use, and the development

of chronic pain (Arkin et al., 2022; Glare et al., 2019; Quinlan-Colwell, 2021).

These concepts primarily address patients experiencing elective postoperative orthopaedic pain; however, many are applicable to nonelective and trauma situations as well. Perioperative pain in patients undergoing orthopaedic surgery is variable depending upon the person-specific characteristics, the etiology of the pain, and the procedure. Providing personalized care that accounts for patient variables and medical history reduces the risk of unmanaged postoperative pain (Rhon et al., 2018). This underscores the importance of individualizing multimodal analgesic plans of care (Gan, 2017; Hsu et al., 2019; Hyland et al., 2021; Lespasio et al., 2019; Perry et al., 2019; Quinlan-Colwell, 2021). Patients who have risk factors for increased postoperative pain can especially benefit from interventions in the perioperative period to modify risk and improve outcomes (Pua et al., 2019). In addition to optimizing analgesic options, utilizing a personalized approach that is based in trust and respect builds a therapeutic alliance between the clinician¹ and the patient (U.S. Department of Health and Human Services, 2019).

¹For the purpose of this statement, to emphasize the importance of the team approach toward positive outcomes, the term “clinician” will be used to reference all providers of the interdisciplinary team, including physicians, advanced practice providers, nurses, rehabilitation providers, etc.

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TABLE 1. PAIN-FOCUSED EXPLANATIONS OF ETHICAL PRINCIPLES

Principle	Meaning	Pain-Focused Meaning	Example
Autonomy and dignity	Independence in one's thoughts or actions, respect	<ul style="list-style-type: none"> Educate patients about side effects and safety concerns, especially the need to balance pain control with personal safety Recognize patients as unique individuals 	<ul style="list-style-type: none"> Accept a patients' preference to not use opioids and offering alternatives to opioids
Beneficence and nonmaleficence	Duty to avoid harm and do what is good for the patient with consideration of the patient's values and desires	<ul style="list-style-type: none"> Relieve pain for the benefit of the patient Do not administer a medication or treatment that is likely to do harm 	<ul style="list-style-type: none"> Advocate for patients to receive sufficient pain medications Be aware of personal biases that may affect care
Justice	Equal and comparable treatment for all patients	<ul style="list-style-type: none"> Recognize that pain is unique for every individual Accept that the phenomenon of pain requires distinct treatments Protect vulnerable patients 	<ul style="list-style-type: none"> Assure access to pain management Share research, lobbying efforts Raise social awareness in a community
Fidelity	Trustworthiness, faithfulness	<ul style="list-style-type: none"> Responsibility to keep promises 	<ul style="list-style-type: none"> Advocate for follow-up care, reassessment of pain, and the support of patients
Veracity	Honesty	<ul style="list-style-type: none"> Exhibit truthfulness about treatment options, including risks and benefits Set realistic expectations 	<ul style="list-style-type: none"> Discuss potential for pain due to procedure or treatment Disclose conflicts of interest

ETHICAL CONSIDERATIONS

Nurses need to have knowledge of the physical, social, cultural, psychological, and spiritual dimensions of the pain experience. The Joint Commission standards require that hospitals provide nurses with resources regarding pain management, including the safe use of opioids, nonopioids, and nonpharmacological pain management options (The Joint Commission, 2017). Nurses have ethical and moral responsibilities to relieve the pain and suffering of patients while mitigating the risk for developing opioid dependence (American Nurses Association, 2018; Anderson & Alger, 2019). Patients' right to autonomy and dignity supports the need for education on the risks, side effects, and safety profile of their pain management treatment options; especially, the need to balance pain control with safety when using opioids. Beneficence and nonmaleficence are essential for nurses to provide care that relieves pain while considering patient values and beliefs. These principles provide direction for nurses to be aware of personal biases that may affect care decisions and to protect patients from harmful treatments.

Providing patient-specific multimodal pain management protects those who may be vulnerable and underpins the principle of justice (Jonsdottir & Gunnarsson, 2021; Morley et al., 2020; Wu et al., 2019). Nurses and patients are obligated to uphold fidelity and veracity within the therapeutic relationship and having candid conversations about the expected presence of pain after surgical procedures promotes realistic pain expectations (MacPherson & Pattullo, 2020). Furthermore, patients are expected to provide an honest appraisal of their need for pain treatment. When nurses are unable to fulfill ethically sound interventions, moral distress can occur (Silverman et al., 2022). Awareness of ethical principles (see Table 1) allows for

meaningful dialogue about conflict and can decrease this distress.

Effective Pain Management is a Right for All Patients

It is widely accepted that pain management is a right for all patients regardless of socioeconomic status, race, age, comorbid disease, level of prestige, environmental setting, or personal identity. To meet this mandate, specific recommendations are delineated for the continuum of care and at each phase of care during an elective orthopaedic hospitalization.

Recommendations for Each Phase of Care

ACROSS THE CARE CONTINUUM

Communication

An open and honest relationship between patients and clinicians¹ is a shared responsibility. Partnerships with patients can take many different forms, including active listening, shared decision making, teaching, and planning; these partnerships foster improved safety, engagement, and improved patient and organizational outcomes (Australian Commission on Safety and Quality in Health, 2021). Patients need to feel that they can inform clinicians about their use of medications, supplements, and substances, with a clinician response of nonstigmatizing assessments and interventions (United States Food and Drug Administration, 2018). Caution should be made during the shared decision-making process as patients may value clinicians' recommendations while neglecting their own preferences (Eggeling et al., 2020).

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Pain Assessment

Because there are no objective tools to quantify the intensity of pain, the patient's subjective report of pain intensity is the most reliable source. The ASPMN advocates that clinicians play a key role in the safe and effective delivery of pain interventions. Interventions should not be based solely on pain intensity ratings obtained from a numerical, descriptive, or behavioral pain scale. Safe and effective opioid dosing requires comprehensive assessments of the individual patient; this includes age, comorbidities, sedation level, respiratory status, coadministration of other sedating medications, the patient's prior response to opioids, and with consideration to the subjective nature of a pain intensity rating (Quinlan-Colwell et al., 2022).

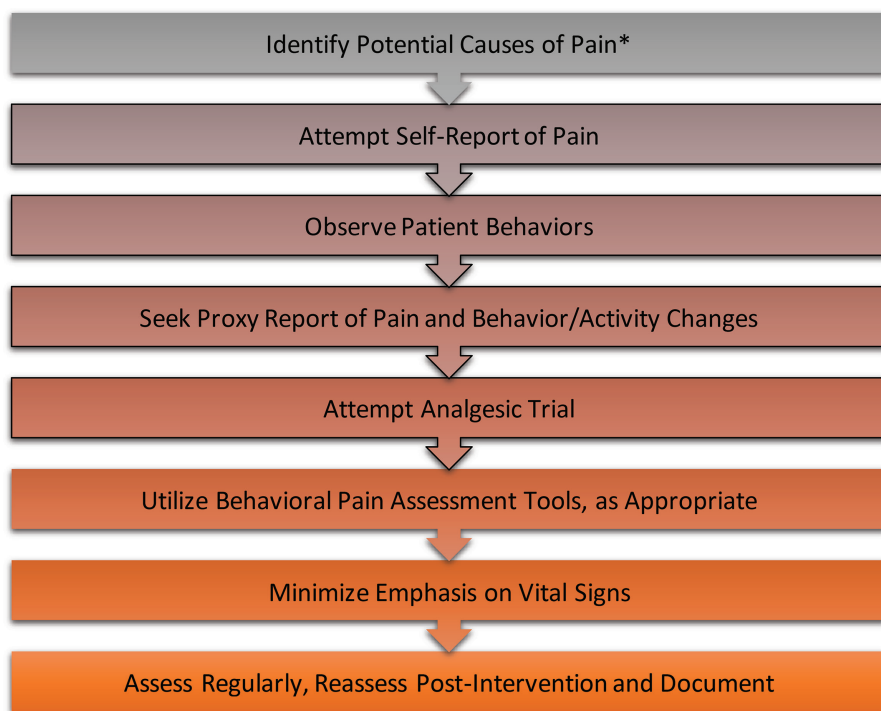
The use of pain assessment tools is key to assessing responses to the treatment plan and guiding changes to the treatment strategies. Patient's self-report should be accepted over objective measures such as vital signs or pain-related behaviors (Chou et al., 2016a, 2016b). Applying individualized assessments to create and adjust pain management plans necessitates a nuanced approach to effectively care for the postoperative pain of patients in vulnerable populations by incorporating individualized risk factors and the assessment of sedation (Herr et al., 2019; Martinez, 2021; Pasero et al., 2016). These assessments help determine if the regimen is adequate, effective, and provides benefits that outweigh potential risks and side effects (Chou et al., 2016a, 2016b).

The use of functional pain scales facilitates assessments and patient education addressing level of pain

and analgesic needs, allowing for improved communication between patients and clinicians (Adeboye et al., 2021; Hierl et al., 2021). Functional pain scales can provide insight into the dimensional aspects of pain beyond simply rating pain intensity; however, studies on the application of these tools in different care settings are needed (Arnstein et al., 2019a, 2019b). Using a hierarchy of pain assessment techniques (see Figure 1) to assess the presence of pain in patients who are unable to self-report enables clinicians to proactively assess and treat potential causes of pain as the first priority in the assessment process (Herr et al., 2019).

Enhanced Recovery After Surgery and Multimodal Analgesia Protocols

Enhanced Recovery After Surgery (ERAS) protocols are a tool to achieve optimal recovery after surgery by enhancing pain management through multimodal analgesia (MMA) that includes the intentional use of appropriate pharmacological and nonpharmacological techniques (Echeverria-Villalobos et al., 2020; Goode et al., 2019; Montgomery & McNamara, 2016; Tick et al., 2018). In conjunction with ERAS, MMA in patients undergoing surgery is an effective strategy to manage pain from the perioperative period through discharge. Multimodal analgesia is not the use of one specific algorithm for treatment, rather it is accomplished by the application of concept. By using medications with different mechanisms of action in conjunction with nonpharmacological treatments, multiple pain pathways are targeted. This means starting with nonopioid analgesics and techniques on a regular basis to minimize opioid use, opioid-related



*First priority only for those unable to self-report

FIGURE 1. Hierarchy of pain assessment in patients who are unable to self-report. Adapted from "ASPMN 2019 position statement: Pain assessment in the patient unable to self-report," by Herr, K., Coyne, P. J., Ely, E., Gélinas, C., & Manworren, R. C. B., 2019, *Pain Management Nursing*, 20(5), 402–403.

TABLE 2. ELEMENTS OF AN EFFECTIVE PAIN MANAGEMENT TREATMENT PLAN**Elements of an Effective Pain Management Treatment Plan**

- Establish realistic, procedure-specific expectations and goals throughout the continuum of care.
- Provide education on medication use that includes indication, dose, frequency, and potential adverse effects, including any changes to patients' analgesic regimen that are recommended prior to surgery.
- Explain the process of pain assessment and how to communicate the presence of pain.
- Create individualized components of the treatment plan.
- Evaluate patient and caregiver understanding of the treatment plan.

Note. From "Management of postoperative pain: A clinical practice guideline from the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council," by Chou, R., Gordon, D. B., de Leon-Casasola, O. A., Rosenberg, J. M., Bickler, S., Brennan, T., Carter, T., Cassidy, C. L., Chittenden, E. H., Degenhardt, E., Griffith, S., Manworren, R., McCarberg, B., Montgomery, R., Murphy, J., Perkal, M. F., Suresh, S., Sluka, K., Strassels, S., ... Wu, C. L., 2016a, *The Journal of Pain*, 17(2), 131–157 and "Multimodal analgesia for acute postoperative and trauma-related pain," by Polomano, R. C., Fillman, M., Giordano, N. A., Vallerand, A. H., Nicely, K. L., & Junquist, C. R., 2017, *The American Journal of Nursing*, 117(3 Suppl. 1), S12–S26.

adverse effects, and reliance on opioids during the post-discharge period (Wick et al., 2017).

Reduction and replacement of opioids can be achieved through implementation of opioid-free anesthesia and analgesia ERAS protocols in the perioperative period (Echeverria-Villalobos et al., 2020). Enhanced Recovery After Surgery protocols may include elements such as local infiltration analgesia, nerve blocks, and MMA (Joshi & Kehlet, 2019; Morrell et al., 2021; Wainwright et al., 2020). When implementing ERAS protocols, successful operationalization is dependent upon patient selection and collaboration with the multidisciplinary team, including key stakeholders across the care continuum (Lam et al., 2021; Pearsall et al., 2015). Education regarding the ERAS protocol is essential so patients understand what to expect and how the various components impact the management of their pain and their recovery (Lam et al., 2021; Pearsall et al., 2015). Attempts to discharge patients with little to no opioids after orthopaedic surgical procedures that are commonly associated with the development of chronic pain can increase the risk of undertreated pain, especially in certain populations, including those with opioid tolerance or chronic pain (Rajput et al., 2022).

Preemptive analgesia is administered before surgical intervention to reduce the nociceptive response to incisional and inflammatory insults of surgery (Gabriel et al., 2019). Multimodal analgesia using a combination of different classes of analgesic medications for synergistic effect is used to improve pain control while sparing the need for opioids (Polomano et al., 2017). Most commonly used pharmaceutical agents include non-steroidal anti-inflammatories (NSAIDs), steroids, acetaminophen, gabapentinoids, and local anesthetics. Multimodal analgesia can also include N-methyl-D-aspartate agonists (i.e., ketamine or dextromethorphan), Alpha-2 agonists (i.e., clonidine), and regional anesthesia. When opioids are lessened, the risk for opioid-related adverse effects and hyperalgesia are also reduced (Chou et al., 2016a, 2016b; Gabriel et al., 2019; Goode et al., 2019; Montgomery & McNamara, 2016).

BEFORE HOSPITALIZATION

Assessment

Preoperative assessment should inform and guide the development of a perioperative pain management plan

(see Table 2). This assessment includes current or historical medical/psychiatric comorbidities, medications, chronic pain, substance use disorder (SUD), and response to postoperative treatment (Chou et al., 2016a, 2016b). In a patient-reported outcome study, patients undergoing total knee arthroplasty (TKA) who demonstrated higher procedure-specific knowledge had less postoperative pain with improved functionality and activity at 8 weeks postprocedure (Bumberger et al., 2021).

The identification of patients at risk for pain catastrophizing in the preoperative phase provides an opportunity to intervene with education about adaptive coping mechanisms to manage anxiety. Predictors of pain catastrophizing include female gender, younger age, complex medical comorbidity, and a diagnosis of anxiety and/or depression (Wood et al., 2016). Recognizing patients with decreased physiological reserves in the preoperative phase allows for interventions to improve, modify, or potentially reverse variables that contribute to fragility (Chan et al., 2019).

Preoperative Education and Preconditioning

Preoperative education supports patients and positively influences expectations. Realistic expectations regarding elective postoperative pain management need to be established between patient and provider prior to the surgical procedure (Filbay et al., 2018; Horn et al., 2020; Institute for Healthcare Improvement, 2019; Khorfan et al., 2020). This can result in less fear of movement after total joint arthroplasty, increased pain pressure threshold, and improved beliefs about upcoming surgery (Louw et al., 2019; Wainwright et al., 2020).

Maximizing preoperative education and conditioning increases the perception of preparedness and decreases opioid utilization (Clode et al., 2018; Khorfan et al., 2020). In a 2022 study, attendance at a preoperative education class before TKA or total hip arthroplasty demonstrated decreased length of stay, increased distance ambulated in therapy, and increased range of motion at discharge when compared with those who did not attend a preoperative education class (Jones et al., 2022).

Furthermore, preoperative education on the use of opioids for pain management has been shown to decrease postoperative opioid consumption (Andelman et al., 2019; Goree et al., 2021; Rucinski & Cook, 2020;

Syed et al., 2018). Patients feel better prepared to manage pain and utilize less opioids at discharge when they receive both preoperative and postoperative education that establishes realistic expectations compared with those who only receive preoperative or postoperative education components alone (Khorfan et al., 2020).

DURING HOSPITALIZATION

Education on Expectations and Goals

During all patient encounters, clinicians need to provide patients and caregivers with individualized education (verbally and in writing) that sets realistic expectations, goals for recovery, and discusses pain relieving strategies. Individualized education and support has been shown to benefit patients with more intensive needs, including those with comorbid conditions or unique social situations. This results in reduced postoperative opioid use, decreased length of hospital stay, and less preoperative anxiety (Hsu et al., 2019). When education is individualized, there is a significant improvement in patient knowledge, reduced occurrences of risky opioid behaviors (i.e., improper opioid use, storage and disposal), and a reduction in self-escalation of prescribed medication (Hsu et al., 2019).

TABLE 3. NONPHARMACOLOGICAL INTERVENTIONS

Nonpharmacologic Interventions	
Passive Interventions	Active Interventions
Massage	Relaxation
Acupuncture	Audio-visual distraction
TENS	Guided imagery
Thermal applications (heat or cold)	Cognitive behavioral therapy
Energetic therapies (therapeutic touch, healing touch, reiki)	Sleep hygiene

Note. TENS = transcutaneous electrical nerve stimulation. From "Orthopedic sleep and novel analgesia pathway: A prospective randomized controlled trial to advance recovery after shoulder arthroplasty," by Cheah, J. W., Freshman, R. D., Mah, C. D., Kinjo, S., Lansdown, D. A., Feeley, B. T., Zhang A. L., & Ma, C. B., 2022, *Journal of Shoulder and Elbow Surgery*, 31(6S), S143–S151; "A systematic review of non-pharmacological interventions used for pain relief after orthopedic surgical procedures," by Fan, M., & Chen, Z., 2020, *Experimental and Therapeutic Medicine*, 20(5), 36; "Non-pharmacological methods and post-operative pain relief: An observational study," by Komann, M., Weinmann, C., Schwenkglens, M., & Meissner, W., 2019, *Anesthesiology and Pain Medicine*, 9(2), e84674; Muaddi et al., 2023; "Post-operative multimodal pain management and opioid consumption in arthroscopy clinical trials: A systematic review," by Paul, R. W., Szukics, P. F., Brutico, J., Tjoumakaris, F. P., & Freedman, K. B., 2021, *Arthroscopy, Sports Medicine, and Rehabilitation*, 4(2), e721–e746; "The use of adjunct psychosocial interventions can decrease postoperative pain and improve the quality of clinical care in orthopedic surgery: A systematic review and meta-analysis of randomized controlled trials," by Szeverenyi, C., Kekecs, Z., Johnson, A., Elkins, G., Csernatony, Z., & Varga, K., 2018, *The Journal of Pain*, 19(11), 1231–1252; and "Drug-free interventions to reduce pain or opioid consumption after total knee arthroplasty: A systematic review and meta-analysis," by Tedesco, D., Gori, D., Desai, K. R., Asch, S., Carroll, I. R., Curtin, C., McDonald, K. M., Fantini, M. P., & Hernandez-Boussard, T., 2017, *JAMA Surgery*, 152(10), e172872.

Education on Treatment Modalities

When developing a pain management plan, the preferences of each patient and their caregiver need to be discussed and included (The Joint Commission, 2021). The Joint Commission requires hospitals to provide nonpharmacological modalities as part of multimodal analgesic plans (The Joint Commission, 2017). Key to beneficial use of nonpharmacological interventions is assuring that clinicians have good understanding of the mechanisms of actions of the therapies and how they can be included in each patient's individualized plan of care. In addition, the nurse providing direct care must be confident and willing to implement and support use (Polomano et al., 2017).

Nonpharmacological pain management interventions (see Table 3) are favored following orthopaedic surgical procedures due to ease of use, low risk for side effects, and analgesic benefit. In a systematic review of randomized controlled trials comparing application of cryotherapy over a closed surgical wound to no cryotherapy application, a moderate effect on reduction of postoperative pain and opioid use was reported with a moderate certainty of evidence (Muaddi et al., 2023). The authors of a meta-analysis of randomized clinical trials in orthopaedic surgery indicated a significant reduction in postoperative pain and perioperative anxiety with cognitive behaviorally based education (Szeverenyi et al., 2018). There is moderate quality evidence, suggesting transcutaneous electrical nerve stimulation be considered as an adjunct to other postoperative pain treatments (Chou et al., 2016a, 2016b). In a subset of patients who had undergone TKA, nonpharmacological interventions were associated with moderate improvement in pain (Komann et al., 2019). Despite limited outcome data, the promotion of postoperative care that includes both passive and active interventions have demonstrated value (Cheah et al., 2022; Fan & Chen, 2020; Komann et al., 2019; Paul et al., 2021; Tedesco et al., 2017).

AFTER HOSPITAL STAY

Self-Management of Pain at Discharge

Optimal patient education requires accurate and current evidence-informed content, including the responsible use of opioids (Hsu et al., 2019). After orthopaedic surgery, patients have reported little knowledge of analgesic options beyond opioid pain treatments and lack of understanding on how to secure prescribed opioids or how to dispose of unused opioids (Bicket et al., 2019; Lovecchio et al., 2019). The strength and quantity of opioids prescribed after orthopaedic surgery has wide variability (Sabatino et al., 2018). Studies have demonstrated that standardization leads to significant reductions in opioid quantities without compromising safety or increasing the utilization of healthcare resources (Hill et al. 2017; Reid et al. 2019; Reid et al., 2020). After orthopaedic surgery, standardized discharge opioid protocols guide providers in prescribing quantities effective for the management of acute pain without contributing to unused opioids which may be misused or diverted (Sabatino et al., 2018). Engaging patients and caregivers to participate

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in the discharge process improves the safety and efficacy of this transition. Discharge discussions that start at the beginning of hospitalization allow for ongoing reevaluation through active listening and assessment of knowledge, validating that the patient's goals align with the discharge plan (Agency for Healthcare Research and Quality, 2017).

Barriers and Challenges to Providing Effective Pain Management

ORGANIZATIONAL

Timely access to pain management specialists in the acute hospital setting contributes to improved outcomes, possibly due to increased expertise in recognizing risk factors related to uncontrolled pain along with increased knowledge of best practice recommendations (Osorio et al., 2022). The adoption of standardized opioid prescribing protocols for postoperative pain have been recognized for their benefits; however, attempting to fit all patients into a standardized protocol can cause undue risk and harm. Rigid protocols may lead to the undertreatment of acute pain and the development of persistent postoperative pain. In addition to the focus on reducing postoperative discharge opioid prescriptions, there is an urgent need for research to substantiate the benefits of nonopioid medications following discharge (Rajput et al., 2022).

Healthcare organizations need to proactively provide multidisciplinary care that focuses on patient safety. This can be achieved through development of standardized policies and continuing education to guide appropriate MMA education and training for clinicians, patients, and caregivers (Hsu et al., 2019; Quinlan-Colwell et al., 2021; The Joint Commission, 2021). High quality pain management requires organizations to identify areas in need of improvement and to support the implementation of evidence-informed interdisciplinary care. Ongoing quality improvement processes need to be in place, including the establishment of an oversight committee to monitor and promote individualized pain management that is safe and effective (Quinlan-Colwell et al., 2021).

To provide safe pain management, organizations must ensure patients are monitored for side effects and adverse outcomes, such as opioid-induced respiratory depression (OIRD) which is a potentially lethal, but preventable, adverse outcome related to opioid consumption. To prevent OIRD and consequential dangerous sequelae, it is critical that organizations prioritize patient safety, educate all clinicians to intervene, and maintain evidence-informed policies that include assessments and interventions to recognize and treat OIRD (ECRI Institute, 2017; Jungquist et al., 2020; McNaughton et al., 2021).

CLINICIAN

Moral disengagement, knowledge deficits, bias, and the inability to provide optimal care due to environmental or economic constraints are factors that limit a clinician's ability to fulfill the obligation to relieve pain and suffering (American Nurses Association, 2018).

Inadequate resources impede clinicians in the delivery of best practice recommendations. Clinicians are routinely challenged to reconsider their opioid prescribing practices, often with rapidly changing clinical and organizational guidance. The Centers for Disease Control Clinical Practice Guidelines for Prescribing Opioids for Pain provide guidance for acute pain management (see Table 4); however, disseminating this information to direct care providers remains a challenge (Dowell et al., 2022). In addition, as with previous guidelines, misinterpretation and application to inappropriate populations can lead to unintentional harm.

PATIENT

Many patients view their participation in pain management as a passive process, relying on the healthcare team to initiate interventions. Patients have limited knowledge about pain management strategies, including how to facilitate or initiate conversations about pain, potential side effects of treatments, timing of analgesic treatments, and the use of nonpharmacological interventions. The perception of active participation is frequently thought of as simply following directions versus having a discussion about an analgesic plan. Nurses are often perceived as overwhelmed and without time for individual requests, which can discourage patients from active engagement in postoperative care (Keast et al., 2022). Patient education in formats that are not sensitive to diverse and individual needs lead to decreased satisfaction in care (McDonall et al., 2019).

VULNERABLE POPULATIONS

A comprehensive discussion of vulnerable populations is expansive and beyond the scope of detail encompassed in this article. Each provider is responsible for becoming familiar with the patient populations for which they provide care, including their attributes and characteristics so that patient-centered, individualized care can be provided. Using an individualized approach allows the clinician to identify strengths and resources that are personalized to each patient's unique history, including the potential of overlapping situations and related circumstances.

Racial, Ethnic, and Socioeconomic Disparities

Disparities in pain care have been demonstrated as racial and ethnic bias in pain treatment, unequal treatment based on socioeconomic status, and reduced access to treatment and care for pain-related conditions (National Institutes of Health, National Institute of Neurological Disorders and Stroke, n.d.). Racial, ethnic, and socioeconomic disparities in pain management can occur along the continuum of care, including during pain assessment and treatment, when applying medical decision-making models, and in the availability of access to healthcare (Feinberg et al., 2022; Lee et al., 2019).

Reduced Healthcare Literacy

Healthcare literacy affects a patient's ability to obtain, understand, and apply healthcare information, and the clinician's ability to communicate and educate.

TABLE 4. RECOMMENDATIONS FOR PRESCRIBING OPIOIDS AFTER PROCEDURES

Prescribe short-acting opioids as needed for procedures known to cause severe pain	<ol style="list-style-type: none"> 1. Nonpharmacological and nonopioid therapies should be maximized. 2. Discuss realistic benefits and known risks of opioid therapy. 3. Opioids should be prescribed at the lowest effective dose. 4. At discharge, prescribe the quantity of opioid deemed appropriate for the expected duration of severe pain. 5. If opioids are required for more than a few days, tapering instructions should be provided.
Review the state PDMP data for the patient's history of controlled substance prescriptions	<ol style="list-style-type: none"> 6. Assess risk for overdose or misuse; this may be indicated by: <ol style="list-style-type: none"> a. Multiple prescribers b. Use of more than one controlled substance c. Concurrent use of medications that depress the central nervous system

Note. PDMP = prescription drug monitoring program. From "CDC clinical practice guideline for prescribing opioids for pain—United States, 2022," by Dowell, D., Ragan, K. R., Jones, C. M., Baldwin, G. T., & Chou, R., 2022, *Morbidity and Mortality Weekly Report*, 71(3), 1–95.

Demographics that have typically been associated with low health literacy (e.g., age, sex, race, and level of education) may be shifting, highlighting the case for a universal health literacy approach that reduces barriers to make it easier for individuals to navigate, understand, and use healthcare resources (Feinberg et al., 2022; Kružliaková et al., 2021). Health disparities accentuate the variability in access to information that patients and caregivers use to understand and make healthcare decisions, ultimately resulting in inequitable healthcare treatment and outcomes (Feinberg et al., 2022). In addition, the level of education obtained has a significant impact on the development of chronic pain. Adults who did not attend college have greater odds of reporting chronic pain than those who have graduated college (Zajacova et al., 2021).

Elderly Population

Older adults are at high risk for experiencing both acute and chronic orthopaedic pain and postoperative complications (Gjorgjievski & Ristevski, 2020). The assessment of fragility, including nutritional status, baseline cognitive function, functional capacity, and social determinants of health need to be included in preoperative evaluation (Chan et al., 2019). Using risk stratification to identify fragility levels in the elderly population preoperatively allows for targeted interventions to improve surgical outcomes (Chan et al., 2019; Kweh et al., 2023). These patients are at an increased risk of functional decline during a hospitalization; optimizing nutrition, early mobilization, and patient and caregiver participation in education are beneficial in circumventing complications of pressure ulcers, pulmonary compromise, and functional decline (Gjorgjievski & Ristevski, 2020; Hirsch et al., 2021). Clinicians need to be aware of appropriate medication selection and dosing to prevent postoperative complications such as central nervous system depression and falls. Guidance to avoid medication-related complications can be found in the Beers Criteria for potentially inappropriate medications (Walker et al., 2022).

Cognitive or Verbal Impairment

If cognitive limitations are present, it is important to remember that these patients are typically still able to report pain. When using tools to assess pain in nonverbal patients, it is imperative to remember that while

behavior may indicate pain, the absence of behavior does not mean there is no pain (Drew & Quinlan-Colwell, 2021; Herr et al., 2019). Use of resources such as the hierarchy of pain assessment in patients who are unable to self-report provides clinicians tools that augment their judgment in practice when assessing pain in patients with cognitive or verbal impairment (see Figure 1; Herr et al., 2019).

Pediatric Population

Parents or adult caregivers of children should be educated preoperatively on the developmentally appropriate assessment and treatment of pain, including pharmacological and nonpharmacological modalities. By addressing pain management preoperatively, preparation can help reduce parents' anxiety, which is associated with a subsequent reduction in pain and pain behaviors in children (Chou et al., 2016a, 2016b).

Patients Who Are Opioid Naïve or Opioid Tolerant

An approach that is personalized and nuanced to the individual patient is necessary for patients with limited or no opioid exposure and those with significant or continuous opioid exposure. Opioid naïve patients tend to use opioids for shorter periods of time and at a lower amount when than patients who use chronic opioids for pain (Cook et al., 2019). Patients who have been prescribed opioid pain medication during the 6-month period before surgery have a significantly greater incidence of prolonged use and greater mean opioid dose (Rosenthal et al., 2019). Appropriate potential candidates for opioid-free orthopaedic surgery are opioid naïve patients with normal hepatic and renal function, without allergies to NSAIDs and acetaminophen, or history of gastrointestinal bleeding or ulcers (Shing et al., 2021).

Patients With SUD

Patients with SUD frequently have acute and chronic orthopaedic pain, yet may experience stigmatization by nurses, resulting in an inability to receive just and equitable care (Martinez, 2021; Sirohi & Tiwari, 2016). Common characteristics in this population include limited access to healthcare and health insurance along with a paucity of financial resources, emotional/social support, and distress tolerance skills.

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Patients who are receiving medications for opioid use disorder (MOUD) or medication-assisted treatment with methadone or buprenorphine are opioid tolerant and may have challenges achieving acceptable postoperative pain management. Historically, there have been varied recommendations regarding best practice strategies for postoperative care for patients receiving MOUD. A recent multisociety collaborative has made the following general recommendations based on review of the literature, including Substance Abuse and Mental Health Services Administration (SAMHSA) 2018 guidelines and expert opinion, regarding buprenorphine in the surgical setting (Kohan et al., 2021; Quaye & Zhang, 2019; SAMHSA, 2021): Buprenorphine should be continued perioperatively as adequate analgesia can be obtained and discontinuing buprenorphine can increase vulnerability to relapse. The best evidence recommendation for patients taking methadone maintenance therapy is to continue methadone treatment throughout the perioperative period (SAMHSA, 2021; Veazie et al., 2020). During the perioperative period, multimodal medications and regional anesthetic interventions should be maximized whenever possible, in addition to the use of full mu agonists. A discharge plan to taper off full mu agonists and return to prior buprenorphine regimen should include collaboration with the patient's outpatient provider.

Implications for Clinical Practice

Clinicians have numerous responsibilities when caring for orthopaedic surgical patients, the following are key implications for clinical practice:

- Education to maintain clinician competence is necessary to provide appropriate care to patients who undergo orthopaedic surgical procedures. This includes understanding how to appropriately and optimally manage pain by applying best care practices, communicating effectively, and customizing treatments to fit the unique needs of the individual patient.
- Applying ethical tenets to pain care contributes to meaningful dialogue and decreases moral distress related to pain management.
- Developing a pain management plan must be a discussion that includes the preferences of each patient and their caregiver (The Joint Commission, 2021).
- Clinicians are responsible for understanding the patient populations for which they provide care, including their attributes and characteristics so that patient-centered, individualized care can be provided.
- Pain assessments and interventions must consider more than subjective pain intensity rating. Assessments must be individualized to include age, functional abilities, comorbidities, sedation level, respiratory status, coadministration of other sedating medications, and prior response to opioids to provide safe and effective treatment (Quinlan-Colwell et al., 2022).

- Clinicians are responsible for creating safe environments that encourage, promote, and optimize communication to support an active role in recovery, increase engagement, and improve knowledge.
- In addition to standard patient education strategies, adopting novel approaches, including video-based programs, on demand online platforms, web-based interactive modules, and direct instruction by clinicians are necessary to support best practices (Goree et al., 2021; Kang et al., 2022).
- Identifying strengths and resources that are personalized to each person's unique history, including related circumstances and vulnerabilities, is necessary for a patient-centered approach.
- Clinicians are uniquely positioned to educate and prevent harm from overprescribing and underprescribing of opioids. Knowledge and understanding of populations who may not fit into discharge opioid prescribing protocols are necessary to avoid undue risk or harm (Rajput et al., 2022).
- To promote safety, clinicians need to identify realistic benefits and potential risks of opioid therapy when establishing treatment goals that emphasize functional outcomes (see Table 4).

Conclusion

The perioperative period for the orthopaedic surgical patient provides opportunities and challenges for nursing. Understanding and applying ethical, evidence-informed, patient-focused, interprofessional interventions will improve healthcare delivery for patients, clinicians, and healthcare organizations. Applying these recommendations throughout the continuum of care optimizes pain management and promotes successful patient outcomes. Continued research on reducing risks for adverse events, increasing the effectiveness of opioid-sparing MMA regimens, improving universal healthcare literacy, and decreasing the effects of health disparities on pain assessments and treatments are needed to reduce practice gaps and increase evidence-informed practice.

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