

The Opioid Epidemic: Impact on Orthopaedic Surgery

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JAAOS Plus Webinar

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Abstract

The past few decades have seen an alarming rise in opioid use in the United States, and the negative consequences from diversion of opioids for nontherapeutic use are dramatically increasing. A significant number of orthopaedic patients are at risk for repercussions from both therapeutic and nontherapeutic opioid use. Orthopaedic surgeons are the third highest prescribers of opioid prescriptions among physicians in the United States. Thus, it is important for orthopaedic surgeons to understand the detrimental effects of opioid abuse on individuals and society and to recognize objective measures to identify patients at risk for nontherapeutic opioid use. These measures include elements of the patient history, recognition of aberrant behaviors, prescription drug monitoring programs, and opioid risk-assessment tools.

The United States represents <5% of the world's population yet accounts for a disproportionate amount of the global consumption of opioids. The United States consumes 80% of the global opioid supply, including 99% of the global hydrocodone supply.¹ The rise in opioid prescriptions began in the 1990s, when pain became viewed as the “fifth patient vital sign.” Subsequently, the US Congress proclaimed 2000 to 2010 the Decade of Pain Control and Research.² In addition to widespread use in the acute setting, opioids are also now prescribed more frequently to treat chronic conditions, including musculoskeletal pain of the spine and extremities.³

Drug Classification Schedule

The US Congress passed the Controlled Substances Act as part of the Comprehensive Drug Abuse Prevention and Control Act of 1970. The legislation created five classification

schedules for controlled substances. Most of the prescription pain medicines that orthopaedic surgeons prescribe or encounter in patients include Schedule II and Schedule III prescriptions, which are both considered to have high potential for abuse and dependence (Table 1). The US FDA reclassified hydrocodone combination products from Schedule III to Schedule II effective October 6, 2014, given the rising concerns of prescription opioid use and misuse.⁴

The Opioid Epidemic

Management of pain is an important part of patient care, particularly after traumatic injuries and following surgery. However, the increased usage of opioids for the treatment of pain has led to several unanticipated consequences for individual patients and for society at large. At the individual level, the use of opioids in some cases can lead to tolerance and worse treatment outcomes for patients.^{3,5} Larger societal issues emerge when

Table 1**Classification Schedules for Controlled Substances**Schedule II prescriptions^a

Combination products containing hydrocodone plus acetaminophen, ibuprofen, or aspirin (Vicodin, Lortab, Norco)

Immediate or sustained-release oxycodone (Percocet, OxyContin)

Hydromorphone (Dilaudid)

Immediate or sustained release morphine sulfate

Codeine sulfate

Methadone

Meperidine (Demerol)

Sublingual or transdermal fentanyl

Schedule III prescriptions^b

Combination products with up to 90 mg codeine plus acetaminophen, ibuprofen, or aspirin (Tylenol with Codeine)

^a Require a written prescription for up to a 90-day supply, and each refill requires a new written prescription.

^b Dispensed or refilled by written or verbal prescriptions.

large increases in opioid prescriptions for pain.¹¹ The increase in opioid prescribing in the past decade was not accompanied by similar increases in the prescribing of nonopioid analgesics, such as nonsteroidal anti-inflammatory drugs (NSAIDs) or acetaminophen.¹¹

The rapid rise in the number of pain clinics is also suspected of contributing to the increase in prescription drug overdose deaths in our country.¹² Pain clinics provide important services for patient care and pain management; however, some pain clinics have been referred to as “pill mills” that prescribe and dispense controlled substances outside the scope of standard medical practice.¹²

Impact on Orthopaedic Surgeons and Patients

Orthopaedic patients can experience a tremendous amount of pain with acute injuries and chronic conditions, and following surgery the treatment plan may involve opioid prescriptions for relief of discomfort. Orthopaedic surgeons are the third highest prescribers of opioid prescriptions among physicians, accounting for an estimated 7.7% of all opioid prescriptions in the United States in 2009.¹³ A recent study highlighted differences in opioid use following hip and ankle fractures in the United States compared with the Netherlands.¹⁴ Eighty-five percent of patients with hip fractures treated in the United States were prescribed opioids after discharge compared with none of the Dutch patients.¹⁴ Similarly, 82% of patients with ankle fractures treated in the United States were prescribed opioids after discharge compared with 6% of Dutch patients.¹⁴ The Dutch patients who were not prescribed opioids after hip or ankle fractures were instead prescribed nonopioid analgesics, including acetaminophen and NSAIDs.

opioids are used inappropriately, including problems associated with nontherapeutic use, such as addiction and unintentional overdose deaths.

Nontherapeutic opioid use has become a national epidemic in the United States, with a threefold increase in opioid abuse in recent years.² One fifth of prescription drug abusers receive their prescriptions from a single physician-prescriber, while a growing percentage obtain them by seeking multiple providers for opioid prescriptions (so-called doctor shopping).⁶ Increases in prescription drug overdoses are largely responsible for the alarming rise in unintentional overdose deaths in the United States, which increased 124% between 1999 and 2007.⁷ Opioids now account for more deaths each year than from cocaine and heroin deaths combined.⁸ In addition, opioid-related deaths are more frequent than deaths from suicide or motor vehicle crashes.⁸ The economic burden of nontherapeutic opioid use in the United States is substantial, with an estimated cost >\$50 billion annually, of which 94% is attributable to lost productivity and criminal justice costs.⁹

An uneven distribution of opioids exists across the globe. Ninety-two percent of the world’s opioid supply is consumed by just 17% of the world’s population.¹⁰ Some opioid use is attributable to better palliative care and access to treatment of cancer-related pain in more medically advanced countries. However, the United States has expanded the use of opioids for non-cancer-related pain. The United States far outpaces all other nations in the use of opioids for pain control, in particular for hydrocodone use, the most commonly prescribed opioid in the world. The United States uses an estimated 27,400,000 grams of hydrocodone annually compared with 3,237 grams for Great Britain, France, Germany, and Italy combined.⁸ There is some concern that management of patient expectations and successful litigation for undertreatment of pain may potentially contribute to the discrepancy of opioid use in the United States compared with that in other countries.

The prevalence of patient-reported pain in the ambulatory setting has not changed in the United States during the past decade; however, there have been

Many have long suspected that orthopaedic patients, especially orthopaedic trauma patients, may be at higher risk for preinjury opioid use and nontherapeutic opioid use, but until recently, there was limited evidence to support this. Toxicology studies at the time of admission to the emergency department have confirmed increased preinjury opioid and alcohol use,^{15,16} and preinjury opioid use is associated with a longer duration of postoperative opioid use.¹⁶ Additional recent studies further corroborate that orthopaedic patients with fractures cared for at trauma centers are significantly more likely to use opioids preinjury than is the general population; also, preinjury opioid use is associated not only with a longer duration of postoperative use but also with postoperative doctor shopping.^{17,18} Furthermore, postoperative orthopaedic trauma patients who continue to use opioids 1 month to 2 months beyond the time of surgery have more psychological distress, less effective coping strategies, more symptoms, and more disability than do patients who do not use opioids, irrespective of the type of injury, surgery, or surgeon.¹⁹

It is important for orthopaedic surgeons and patients to understand the detrimental effects of opioid use on clinical outcomes across the spectrum of orthopaedic subspecialties. For example, opioid use has been associated with worse clinical outcomes in musculoskeletal conditions, including occupational musculoskeletal disorders,⁵ total knee arthroplasty,³ reverse shoulder arthroplasty,²⁰ and spine surgery.²¹

Identifying the At-risk Patient

Screening for patients at risk for nontherapeutic opioid use is very challenging. Pain is a subjective symptom, and patients may have unknown

Table 2

Identifying the At-risk Patient

Risk factors for nontherapeutic opioid use

Personal or family history of substance abuse

Nicotine dependency

Age <45 yr

History of depression or other psychiatric diagnoses (eg, schizophrenia, bipolar disorder)

Lower level of education

History of preinjury/preoperative opioid use

Aberrant behavior monitoring

Early refill requests

Treatment noncompliance

Reports of "lost or stolen" prescriptions

motives or secondary gain issues when reporting. Physicians often rely more on suspicion than objective data when screening for nontherapeutic opioid use. However, it is very challenging to predict which patients may be at risk for nontherapeutic opioid use based on clinical judgment alone. Objective measures to help detect nontherapeutic opioid use include elements of the patient history, recognition of aberrant behaviors, urine drug testing, prescription drug monitoring programs, and opioid risk-assessment tools.

Some specific characteristics in the patient's history may serve as markers for nontherapeutic opioid use. Risk factors for nontherapeutic opioid use include personal or family history of substance abuse, nicotine dependency, age <45 years, depression, and other psychiatric diagnoses (eg, schizophrenia, bipolar disorder)² (Table 2). Two recent studies indicate that a lower level of education¹⁷ and history of preoperative opioid use^{17,18} are significant predictors of postoperative doctor shopping in the orthopaedic trauma population. Determination of these risk factors should be part of the initial history and screening process. Unfortunately, although obtaining an appropriate prescription drug history is recom-

mended, self-reported opioid use is often unreliable.²

Recognition of aberrant behavior is an important component of the screening process. Aberrant behavior such as early refill requests, treatment noncompliance, or reports of "lost or stolen" prescriptions should be documented (Table 2); however, monitoring for aberrant behavior alone may be inadequate.² A combination of aberrant behavior monitoring and use of urine drug testing has been recommended as a valuable treatment strategy, especially in patients with a history of chronic opioid use.² Urine drug testing has yielded up to 50% nonadherence to opioid prescription therapy in chronic opioid users.²

State prescription drug monitoring programs are electronic databases that collect data on controlled-substance prescriptions to deter nontherapeutic opioid use and doctor shopping. Because these programs are designed and maintained at the individual state level, there is limited ability for data exchange between states. Forty-seven states currently have an active prescription drug-monitoring program, and all 50 states are expected to have operational programs in the near future. Only seven states currently have laws in place

Table 3**Example of a Postoperative Pain Management Protocol With an Opioid Taper Following Fracture Surgery**

Time After Discharge	Dosage
First 2 wk after discharge: Oxycodone 10 mg	1 tablet every 4 to 6 h for 14 d
Week 3 (if necessary): Hydrocodone/acetaminophen 10/325 mg	1 or 2 tablets every 4 to 6 h for 7 d
Week 4 (if necessary): Hydrocodone/acetaminophen 7.5/325 mg	1 tablet every 6 hours for 7 d
Week 5 (if necessary): Hydrocodone/acetaminophen 5/325 mg	1 tablet every 8 hours for 7 d
Week 6 and beyond (if necessary)	Over-the-counter medications including acetaminophen and acetaminophen extra strength. Patients with fracture fixation may start NSAIDs at week 12 after surgery. Patients without fracture fixation may be started on NSAIDs immediately postoperatively.
If stronger pain medication is needed at 6 wk postoperatively or beyond: Tramadol 50 mg	1 tablet every 8 h for 14 d

NSAID = nonsteroidal anti-inflammatory drug

mandating providers to look up each patient in the online state database before prescribing opioid medications: Kentucky, Massachusetts, New Mexico, New York, Ohio, Tennessee, and West Virginia.

There are other specific opioid risk-assessment screening tools that have been applied to chronic pain patients and may better stratify patient risk factors for nontherapeutic opioid use. Among the several validated screening tools for opioid risk assessment are the Opioid Risk Tool, the Pain Medication Questionnaire, and the Screener and Opioid Assessment for Patients with Pain–Revised.² These tools may have application in the orthopaedic population given the reliance on opioids in some instances for long-term pain management.

A comprehensive strategy of risk assessment with patient history, recognition of aberrant behavior, urine drug testing, prescription drug-monitoring programs, and opioid risk-assessment screening tools may

be necessary in select cases. Orthopaedic surgeons' awareness of these available objective measures can be useful adjuncts to clinical experience and judgment when dealing with challenging patient scenarios.

Setting Patient Expectations

The foundation of the patient-physician relationship is built upon trust. Physicians trust that a patient's subjective report of his or her level of pain is accurate and then do their best to adequately control the patient's discomfort. Patients trust that the physician will listen to them and try to alleviate their symptoms to the best of the doctor's ability. It is important for physicians to reassure patients that they intend to control their pain but emphasize the importance of doing so in a responsible manner. Part of this responsibility involves minimizing the use of

opioids when possible to avoid problems for the individual patient as well as because of societal pressures secondary to the ongoing opioid epidemic.

Pain control is an important determinant of patient satisfaction. Physicians should aim to control pain and improve patient satisfaction while avoiding overprescribing opioids. Most patients truthfully represent their levels of pain, but unfortunately, a small percentage of patients use opioids nontherapeutically and doctor shop for additional opioids, making this a delicate balancing act for physicians.

Several strategies exist to establish expectations and boundaries for pain management with patients. It is important to counsel patients and establish reasonable expectations for pain as part of treatment plan discussions and follow-up visits. Establishing a standard pain protocol for specific surgical and nonsurgical treatment plans with an opioid taper can be helpful (Table 3). For example, a standard protocol can be used for a patient to be transitioned off an opioid to acetaminophen or NSAIDs at a specific time following surgery. A standardized regimen will help physicians and office staff more readily identify when a patient is requiring a longer duration or higher doses of opioid or is otherwise exhibiting aberrant behavior. Furthermore, orthopaedic surgeons can seek consultation from pain management specialists when pain control is inadequate or when patients have high levels of drug tolerance because of chronic opioid use.

Summary

Nontherapeutic opioid use is becoming more prevalent across multiple specialties, including orthopaedics, and carries a risk of potentially serious consequences.^{7,13} Orthopaedic

surgeons must continue to treat their patients' pain while also establishing strategies based on objective measures and patient communication to help battle the opioid epidemic at both the individual and societal levels.

References

Evidence-based Medicine: Levels of evidence are described in the table of contents. In this article, reference 5 is a level I study. References 15, 18, and 21 are level II studies. References 3, 17, 19, and 20 are level III studies. References 7, 11-14, and 16 are level IV studies. References 1, 2, 8, and 9 are level V expert opinion.

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