

An Appraisal of Using Opioids in Patients with Opioid Use Disorder

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Podiatric physicians have come to realize that opioid use disorder (OUD) is a public health crisis causing morbidity, mortality, lost productivity, and legal cost in the United States. Opioid analgesics are efficient first-line pain relievers for acute and chronic lower-extremity pain syndrome. Perioperative pain management strategies have been proposed using opioid stewardship, but there are few standardized protocols to guide podiatric medical providers treating patients with OUD. First, we describe the pharmacology of therapeutic agents used as medications for addiction treatment for OUD and substance use disorder (SUD). Second, we offer criteria for selecting acute pain and perioperative management in patients with OUD and SUD per current medical literature. Finally, we review the literature applying opioid stewardship in the context of prescribing opioid analgesics in the presence of OUD and SUD.

Three hypothetical clinical scenarios grounded in clinical-based literature are described with congruent data and founded guidelines. The first and second scenarios describe acute pain and perioperative management in patients with OUD receiving methadone and buprenorphine-naloxone, respectively. The third scenario describes acute pain and perioperative management in a patient with SUD receiving intravenous naltrexone. We hope that the lower-extremity specialist will appreciate that thoughtful management of acute perioperative pain among patients who receive medications for addiction treatment for OUD is critically important given the risks of destabilization during the perioperative period. The literature reveals the lack of rigorous evidence on acute pain management in patients who receive medication for OUD; however, some clinical evidence supports the practice of continuing methadone or buprenorphine for most patients during acute pain episodes. (J Am Podiatr Med Assoc 113(3), 2023)

Podiatric physicians have come to realize the inescapable fact that opioid use disorder (OUD) has become a public health crisis and has caused significant morbidity and mortality, loss of productivity, and increased costs to the criminal justice system in the United States.¹⁻³ It was estimated in 2018 that 2 million people in North America had a substance use disorder (SUD) related to prescription opioid pain medication.⁴ The lower-extremity specialist understands that there exists a possibility in which they may have to use an opioid analgesic in their scope of practice. Opioid analgesics are acknowledged as being efficient and an accepted first-line analgesic therapy for both acute and chronic lower-extremity pain syndrome. The possibility exists that a podiatric physician will encounter a patient who will

need an opioid analgesic for a pain syndrome who presents with an OUD at the same time. Obviously, the podiatric medical provider will rely on published opioid stewardship principles to prevent opioid harm.⁵⁻⁷ Ward et al⁸ assert that the perioperative management of patients with OUD in the general hospital setting is complex and requires a multidisciplinary approach. Furthermore, the pain management of patients with OUD is challenging, and a multimodal analgesia should be considered.⁸ The lower-extremity specialist should accept that the perioperative phase is a very vulnerable time for patients with OUDs. Moreover, individuals with OUD may fear that they will face unfair treatment and judgment by medical providers during their hospital stay. Shame and stigma are common among individuals with SUD and are known to confound their help seeking.⁹ Furthermore, they worry about receiving inadequate pain relief, experiencing opioid withdrawal symptoms, and relapsing.⁹ Patients with OUD have been shown to have lowered pain

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tolerance, increased sensitivity to pain, and comorbid chronic pain conditions compared with opioid-naïve control groups.^{10,11} Although several perioperative pain management strategies have been proposed using opioid stewardship principles, there is a paucity of research and of standardized protocols to guide the clinical practice of anesthesiologists, surgeons, and lower-extremity providers who treat patients with OUD.^{12,13}

Opioid addiction and pain reactivity is still in the early stages of research.¹¹ Wachholtz and Gonzalez¹¹ assert that there is a limited understanding of opioid addiction-related hyperalgesia in the treatment literature, and limited awareness of the psychological and physiologic aspects that inform the pain experience in individuals with a history of opioid addiction. Moreover, as essential health-care providers, podiatric physicians have come to realize that the perioperative phase is a very vulnerable time for patients with OUD.⁸ Moreover, they have understood that the optimal management of acute pain in these patients must be individualized. The preoperative evaluation by podiatric physicians should aim to identify those with OUDs and assess factors that may interfere with OUD treatment and pain management. Efforts should be made to provide education and assistance to prescribers to empower their patients and their support systems. Therefore, noting these findings, the essential theme of this review is to provide data and information on the treatment of acute and postoperative pain in patients with OUD within the scope of podiatric physicians. This information may also be of value for specialists providing care to patients with other SUDs. First, the pharmacology of frequently prescribed medications for addiction treatment of OUD and SUD is described. Second, both hypothetical examples and criteria for selecting acute pain and perioperative management in patients with OUD as found in the current medical literature is offered. Finally, clinical literature applying opioid stewardship in the context of prescribing opioid analgesics in the presence of an OUD and SUD is provided.

Medications for OUD

Data suggest that OUD is a chronic disease that should be managed medically by medications for addiction treatment. Three medications have been approved by the Food and Drug Administration for OUD: methadone, buprenorphine, and naltrexone (Fig. 1). With medication management, patients are more likely to enter full recovery, contribute to their

family and community, and reach their full potential.¹⁴ Medication management should involve shared decision making between the patient and the medical provider. In addition, patient preference, adverse effects, availability, cost, access, and tolerance should also play a role. Long-term pharmacotherapy for OUD doubles the likelihood of opioid abstinence compared with behavior therapy alone.¹⁵

Methadone

Clinically, methadone is a highly effective treatment for OUD, and when used for OUD it must be administered by an opioid treatment program. Methadone, a synthetic full μ -opioid receptor agonist, is structurally unrelated to other opioids; it exhibits *N*-methyl-D-aspartate (NMDA) receptor antagonist activity.¹⁶⁻¹⁹ Available formulations are racemic mixtures of two isomers. The R isomer is an NMDA receptor antagonist that inhibits the uptake of norepinephrine and serotonin, and the S isomer is a μ - and δ -opioid receptor agonist.¹⁶⁻¹⁹ Methadone's basicity and high lipophilicity largely contribute to its long half-life. Methadone has a

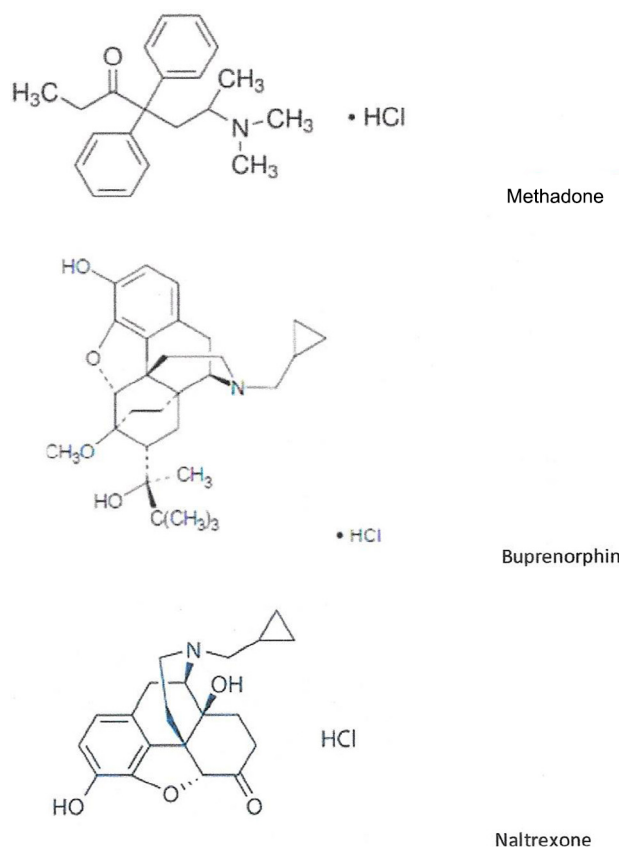


Figure 1. Chemical structures of medical abstinence therapeutics.

long history of being the primary opioid replacement agent based on its slow onset of action of approximately 3 to 5 days and its long elimination half-life of 8 to 59 hours.^{17,19} Methadone and its metabolites are excreted into the urine and feces, with the excretion rate increasing and shifting to the renal route when urinary pH is less than 6. Typically, 11% of a methadone dose is renally eliminated, but this can increase up to 57% in urine acidification. In higher doses, methadone may have serious adverse effects, including respiratory depression, arrhythmias due to prolonged QT interval, and drug-drug interactions from CYP450 metabolism.^{16,19} The action of methadone at opioid receptors can lead to opioid-related adverse effects, including sedation, respiratory depression, and constipation. These effects are additive with other medications that cause these effects as well as with concomitant medications that increase methadone levels. A study of maintenance methadone found that patients were cross-tolerant to the analgesic effects of morphine and that pain relief, when achieved, did not last as expected.¹⁸

Buprenorphine

Buprenorphine, a semisynthetic opioid, was developed in the 1970s and was not approved in the United States for OUD until 2002, although a parenteral formulation was approved for analgesic use in 1989.^{20,21} Buprenorphine has become the medication of choice for many patients with OUD. Buprenorphine is a semisynthetic partial (low intrinsic efficacy) agonist at the μ -opioid receptor, which mediates effects of opioid craving and withdrawal, analgesia, and respiratory depression. Given its partial agonism, the maximum analgesic effect produced by buprenorphine is less than that produced by a full agonist opioid, particularly in patients with opioid tolerance.²¹ Buprenorphine is efficacious and effective for OUD because it provides relief from craving and withdrawal, produces opioid blockade, has an excellent safety profile, has reduced abuse liability compared with full opioid agonists, and is suitable for daily or less-than-daily dosing.²⁰ Interperson variability in transmucosal buprenorphine pharmacokinetics is high, with estimates of bioavailability. Buprenorphine bioavailability is high after intravenous or subcutaneous administration, considerably lower by the sublingual and buccal (transmucosal products) routes, and very low orally.²⁰ When buprenorphine is administered via routes that undergo first-pass metabolism (ie, sublingual/buccal), buprenorphine is metabolized to norbuprenorphine via CYP450 3A4/5-mediated

N-dealkylation, and both buprenorphine and norbuprenorphine undergo glucuronidation to buprenorphine-3-glucuronide and norbuprenorphine-3-glucuronide—metabolites that are generally considered inactive.²⁰ The use of opioid agonists such as methadone and buprenorphine offers the advantage of activating receptor sites so that dopamine is released, which is why these products are chosen where naltrexone action does not increase dopamine release and is targeted for a specific subpopulation of patients with OUD.

Naltrexone

Naltrexone hydrochloride tablets USP, an opioid antagonist, is a synthetic congener of oxymorphone with no opioid agonist properties. Naltrexone hydrochloride is a pure opioid antagonist. It markedly attenuates or completely blocks, reversibly, the subjective effects of intravenously administered opioids. When co-administered with morphine on a long-term basis, naltrexone hydrochloride blocks the physical dependence to morphine, heroin, and other opioids. The administration of naltrexone hydrochloride is not associated with the development of tolerance or dependence. In individuals physically dependent on opioids, naltrexone hydrochloride will precipitate withdrawal symptoms. Naltrexone hydrochloride is a pure opioid receptor antagonist.²² Although well absorbed orally, naltrexone is subject to significant first-pass metabolism, with oral bioavailability estimates ranging from 5% to 40%. The activity of naltrexone is believed to be due to both the parent and the 6- β -naltrexol metabolite.²² Both the parent drug and metabolites are excreted primarily by the kidney (53%–79% of the dose); however, urinary excretion of unchanged naltrexone accounts for less than 2% of an oral dose, and fecal excretion is a minor elimination pathway.²² The urinary excretion of unchanged naltrexone accounts for less than 2% of an oral dose; urinary excretion of unchanged and conjugated 6- β -naltrexol accounts for 43% of an oral dose.²² The pharmacokinetic profile of naltrexone suggests that naltrexone and its metabolites may undergo enterohepatic recycling.²²

Acute Pain and Perioperative Management

Patients with OUD

Managing acute pain in patients with OUD taking medication (methadone, buprenorphine, or naltrexone)

can be complicated by patients' higher baseline pain sensitivity and need for higher opioid doses to achieve pain relief.^{23,24} The approach to managing acute pain to include perioperative pain in patients who are receiving opioid agonist therapy is a common clinical challenge.²³ Podiatric clinicians may be less familiar with opioid agonist therapeutic agents, thus lending potential to the undertreatment of acute pain. Undertreatment is often perpetuated by some providers' fear of adverse effects, including respiratory and cognitive suppression, and by the misinterpretation of patient-reported pain as drug-seeking behavior. Furthermore, the misconception that patients derive sustained analgesia from opioid agonist therapy may play a role in the undermanagement of acute pain.²⁴ A summary of relative points that the lower-extremity specialist should be mindful of when considering the prescribing of opioid analgesic agents to patients who have OUD is presented in Table 1.

The lower-extremity specialist should allow for all patients who may undergo surgical intervention and be admitted to an acute care hospital for operative care to be screened for OUD. The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* criteria for diagnosing an OUD include diagnostic criteria that evaluate patients' behavior, withdrawal symptoms, and tolerance.^{24,33,34} Moreover, patients with an active OUD should be referred for

treatment during the hospitalization whenever possible. Of course, hospitalization can present an excellent opportunity for proper diagnosis and initiation of treatment for OUD. Patients with symptoms of an OUD should have a facilitated referral for addiction specialty evaluation and treatment. If treatment for OUD is started during the hospitalization, the inpatient team should carefully coordinate continuation of addiction treatment starting immediately after hospital discharge.^{24,33} Failure to address the symptoms of abrupt opioid withdrawal may lead to patients leaving the hospital without completing treatment, or patients obtaining and using illicit opioids during the hospitalization. Furthermore, abrupt discontinuation of buprenorphine or methadone was associated with a very high relapse rate. Three literature sources centered on illicit opioid relapse rates noted rates greater than 90% when buprenorphine treatment for OUD was discontinued after 12 weeks.^{24,33,34} Generally, an assertion centered on relapse rate for a patient usually with OUD who receives treatment without medication-assisted treatment is 80% within 3 years.^{35,36} The longer patients stay in treatment, the greater their chance of survival.^{35,36} Sun et al³⁷ asserted that overdose rates have been shown to substantially increase after premature treatment cessation compared with those who continue treatment. The podiatric physician should understand that not allowing patients to

Table 1. Summary of Treating Acute or Perioperative Pain in Patients with Opioid Use Disorder (OUD)²⁵⁻³²

- All of the patients admitted to an acute care hospital for operative care should be screened for OUD.
- Specialty consultation with pain medicine, addiction medicine, or psychiatry should be initiated early during the admission process.
- Initiation of medication management for the underlying OUD is a critical aspect of care and should not be delayed whenever possible.
- Acknowledgment that patients with OUD may be highly tolerant to the analgesic effects of opioids, and as a result, opioids, even at high doses, may not provide adequate analgesia.
- Methadone for OUD is administered once daily.
 - Preoperatively, the dose should be verified with the opioid treatment program, and maintenance methadone should be continued throughout the perioperative period.
- Naltrexone is an opioid antagonist. For OUD it can be administered orally once daily; alternatively, an extended-release form is administered intramuscularly once a month.
 - Perioperative management of naltrexone should be coordinated with the naltrexone prescriber.
 - For oral naltrexone, stopping 72 h before surgery can be considered.
 - For extended-release injectable naltrexone, scheduling surgery 4 wk after the last dose is an option.
 - Patients continuing naltrexone will likely require higher doses of opioids for pain management.
 - For patients who have stopped taking naltrexone, increased sensitivity to opioids may occur due to opioid receptor upregulation.
- Limited evidence exists to guide perioperative management of buprenorphine.
 - The most recently published advisory recommended continuation of buprenorphine throughout the perioperative period.
 - Risks of inadequate pain control must be weighed against risks of relapse and need for buprenorphine re-induction.
 - An individualized approach is recommended with coordination with the buprenorphine prescriber.
- OPENP (overdose prevention education and naloxone prescription) given to all patients with OUD or substance use disorder.

have medication-assisted treatment is much more likely to result in an overdose death.

Patients with OUD Taking Methadone

Patients with OUD taking methadone should continue to receive methadone during their hospital stay. The outpatient methadone dose should be confirmed with the methadone treatment program. Acute pain during the hospitalization will usually not be adequately controlled with methadone alone. Multimodal analgesia should be provided whenever possible. Additional systemic opioids may be necessary and can be initially provided via intravenous patient-controlled analgesia. However, both the patient and providers should be aware that opioids, even at high doses, may not provide adequate analgesia, and systemic administration of opioids in opioid-tolerant patients are associated with increased risk of harm. Therefore, patients should be carefully monitored for the development of sedation, respiratory compromise, opioid-induced constipation, and euphoria. Pain medicine or addiction medicine specialty consultation should be considered. Careful coordination of care should be implemented when making discharge planning related to postdischarge pain care. Patients with SUD, especially OUD, are at increased risk for opioid overdose after discharge. Patient education regarding these risks should be provided. Careful planning, including safe medication storage, home nursing visits, limited duration of opioid prescribing, and early return visits, should be considered. Opioid use should be carefully monitored and discontinued as soon as possible. Patients receiving methadone for treatment of OUD who are then prescribed additional opioids for the treatment of acute pain should be co-prescribed naloxone.²⁴

A 23-year-old woman presented to the emergency podiatric medical clinic for evaluation and treatment for bimalleolar fracture of the right ankle in need of open reduction and internal fixation and acute pain and perioperative management (summarized in Table 1) because she is taking methadone 240 mg per day as medication-assisted treatment.

Patients with OUD Taking Buprenorphine

Patients receiving buprenorphine for OUD may present a challenge when admitted for surgery or other painful acute medical conditions. Whenever possible, specialty consultation (often pain medicine, addiction medicine, medical toxicology, or psychiatry) should be obtained to establish a pain treatment plan for patients taking buprenorphine in

advance of scheduled elective surgery. Previous guidelines have suggested that buprenorphine be discontinued before surgery so that the patient can be rotated to an alternative opioid agonist during the perioperative period. However, there is growing evidence that patients should not be rotated from buprenorphine to short-acting opioids before treatment and that use of short-acting opioids may be associated with increased risk of overdose and relapse.^{24,34} Therefore, this guideline suggests that the patient be continued on buprenorphine throughout the perioperative period.^{24,38,39}

The cornerstone of pain care is multimodal treatment, focusing on the use of regional analgesic techniques whenever possible, as well as the use of nonopioid pain treatment options. Short-acting opioids for breakthrough pain during hospitalization can be used in addition to buprenorphine but may not be effective and may increase the risk of relapse.^{24,40} If patients who have been on buprenorphine for the treatment of OUD are discharged with prescriptions for opioids other than buprenorphine for short-term use, consideration should be given to also prescribing naloxone. Opioids prescribed in addition to buprenorphine should be prescribed in the lowest effective dose for the shortest period possible. These patients should receive well-coordinated, frequent visits after their hospital discharge with experienced caregivers to allow for careful monitoring for adequate pain control and possible relapse.²⁴

Patients with OUD Taking Naltrexone

Naltrexone is an opioid antagonist that blocks the effects of opioids on the opioid receptor. Naltrexone can be used for the treatment of OUD and for other off-label indications and can be administered orally or via a monthly administered extended-release intramuscular formulation. Long-term use of naltrexone is associated with an increase in the density of opioid receptors and loss of tolerance to the effects of opioids.²⁴ Therefore, patients who have been taking naltrexone who then stop the medication and receive opioids are at significant risk for overdose and death. Patients receiving naltrexone for the treatment of OUD may have strong preferences regarding being exposed to opioids at the time of surgery.²⁴ Pain care should honor these preferences whenever possible. Careful planning and coordination of care should be implemented in advance of elective surgery. The cornerstone of pain care is multimodal treatment, focusing on the use of

regional analgesic techniques and nonopioid medications whenever possible.²⁴ If opioids are to be used for the treatment of pain, oral formulations should be discontinued at least 72 hours in advance of surgery, and surgery should be scheduled 4 weeks after the last dose of intramuscular naltrexone. Patients will be at increased risk for relapse at this time, and if relapse occurs, they will be at increased risk for opioid overdose and death.²⁴ Likewise, extreme care should be taken regarding opioid dosing, both in the inpatient setting and after hospital discharge.²⁴

A 35-year-old woman has a 21-year history of alcohol abuse and identifies herself as a person with SUD and receives intravenous naltrexone once a month. She desires elective surgical intervention for chronic left foot pain from a bump on the inside of her foot and wants bunion surgery. A review of the available treatment is summarized in Table 1 to empower the podiatric physician with treatment directives for acute pain and perioperative opioid analgesia.

Opioid Stewardship and Patients with OUD

Surgical procedures, including lower-extremity procedures, are key drivers of pain development and opioid utilization globally. Perioperative pain management and opioid stewardship are, therefore, comparable in necessity and interrelated in execution. Perioperative “opioid stewardship” may be defined as the judicious use of opioids to treat surgical pain and optimize postoperative patient outcomes. The model is not simply “opioid avoidance,” and it requires balancing the risks of both overuse and underuse of these high-risk agents. Postoperative opioid minimization should be pursued only in the greater context of optimizing acute pain management, reducing adverse events, and preventing persistent postoperative pain through comprehensive multimodal analgesia.

The acronym *MORPHINE* was introduced in 2020 by Smith⁵⁻⁷ to assist podiatric physicians during opioid prescribing to treat pain. Each letter stands for an essential principle of opioid stewardship. Clinical-based evidence is presented to defend use of the *MORPHINE* acronym by providing an argument highlighting current ethical prescription standards and legal regulations in the context of opioid stewardship principles aimed at alleviating the widespread opioid crisis as well as to allow for prescribing opioid analgesics in the context of OUD.⁴¹⁻⁵⁰

M is for multimodal analgesic strategies. A multimodal analgesic approach is likely to produce superior analgesia compared with an opioid-based approach because multimodal analgesic agents target a variety of pain pathways.⁴¹⁻⁴³ The lower-extremity clinical-based published evidence has described the positive effects of using local anesthetic products to reduce postoperative pain and reduce the need for opioid analgesics after an intervention. It is now widely accepted as a means to reduce opioid consumption and adverse effects. Many nonopioid multimodal agents are inexpensive and benefit patients by resulting in lower consumption of opioids. Finally, podiatric physicians have come to respect that many states have legislatively put forth policies limiting the duration of acute pain and postoperative opioid analgesic therapy to avoid opioid prescription harm.

O is for the development of an opioid formulary. An opioid stewardship program can limit opioid initiation by creating prescribing guidelines.^{41,42} The lower-extremity specialist can create a personal opioid formulary by rigorously and regularly using one or two drugs for each clinical condition commonly encountered. A short-acting opioid product such as morphine may be the medication of choice for patients who have OUD. Factors for objective opioid selection include drug efficiency, safety, patient acceptability, and cost.

R is for recognize and reduce risks for opioid harm. Therapeutic success depends on proper candidate selection, assessment before administration of opioid therapy, and close patient monitoring.⁴¹⁻⁴⁵ The lower-extremity specialist should allow for patients who may undergo surgical intervention admitted to an acute care hospital for operative care to be screened for OUD as part of applying the opioid stewardship process for substance abuse.^{33,34}

P is for the pharmacokinetics, pharmacodynamics, and pharmacogenomics of opioid analgesic, as well as medications used for medication absence therapy. The lower-extremity specialist must be aware of dangerous combinations of medications, over-the-counter products, and herbal supplements to avoid deadly drug-drug interactions. Sometimes, dangerous drug combinations are indeed prescribed for legitimate reasons without recognition of the possible dangerous effects. Furthermore, a patient's diseases may affect or be affected by opioid treatments. Liver disease may make using acetaminophen difficult, and renal disease often prevents the use of nonsteroidal anti-inflammatory medications.⁴¹⁻⁴⁹ Guo et al⁵⁰ relate that oral morphine has

traditionally been widely used for treating patients with moderate or severe pain.

H is for help. Seek a pain specialist when needed. This perspective is important when acute pain or perioperative and postoperative pain regimens are needed. Pain management specialists can empower a patient's ability to function and improve their quality of life.⁴¹⁻⁴⁴ Patients with SUDs with medically legitimate pain sufficient to justify opioid use must be closely monitored.⁴¹⁻⁴⁴ Lower-extremity clinicians can play an important role in patient selection and referral for chronic pain management and provide ongoing collaborative care to include monitoring for efficacy and adverse events and facilitating communication with the treating specialist. Becker et al⁵¹ report that the most important reasons to refer a patient to a specialist include abusive medication use, such as early and consistent refill requests or positive drug screens; excessive alcohol use; unwillingness to try other pain treatments or medication options; concurrent prescription for opioids and sedatives; mental health symptoms; and OUD being treated with methadone or buprenorphine/naloxone with patients experiencing persistent, impairing pain.⁵¹ Podiatric physicians need to acknowledge Becker et al's referral risk list while balancing actions that are void of stigma of the their patients. Stigma against individuals with an SUD, pain, or both is a common barrier to healing. A widespread lack of information and understanding about mental health or SUD can lead to public attitudes of shame and blame. Public stigma refers to the collection of negative beliefs that society has about people with OUD, such as the idea that people with SUD are somehow "dangerous" or "manipulative." Second, "enacted stigma" describes how people act on their negative beliefs about OUD; podiatric physicians need to be aware of enacted stigma. People who use opioids are not the only ones who experience stigma. Loved ones and colleagues may also face courtesy stigma simply for associating with them or not preventing opioid use.

I is for use of information technology. The ability to use information technology resources is critical to provide benchmarking of opioid use and the collection of metrics to create clinical decision support tools to build best practice models.⁴¹⁻⁴⁴ Use of the electronic health record can prioritize nonopioid and nonpharmacologic pain management options and redirect clinicians who have historically been trained to practice using opioids as a first-line pain relief option.⁴¹⁻⁴⁴ Opioid stewardship programs can leverage electronic health records to develop dashboards of opioid-use patterns by departments and

with the goal of reducing variability as a marker of quality care.⁴¹⁻⁴⁴ Furthermore, these stewardship programs can give oversight of regulatory changes and evolving state laws that influence prescribing, mandatory prescription drug monitoring program queries, consent for minors for opioid use, and prompts for the initiation of control substance agreements.⁴¹⁻⁴⁴ Finally, the information technology arm of the opioid stewardship program will assist with legal compliance at the state and national levels as all 50 states and some United States territories have now adopted some form of electronic prescription drug monitoring system.⁴¹⁻⁴⁴

N is for the number of opioid doses. Ideally, an opioid stewardship program can assist with lower doses being prescribed to patients by using data collected by information technology.⁴¹⁻⁴⁴ The podiatric and lower-extremity orthopedic medical literature indicates that postoperative patients may have an abundance of leftover opioid analgesic dosing units that may cause accidental ingestion and opioid overdose. Overton et al⁵² report that procedure-specific prescribing recommendations may help provide guidance to clinicians who may currently overprescribe opioids after surgery.⁵³ Ideally, opioid analgesics are prescribed by balancing the beneficial and adverse effects. The appropriate combination of agents, including opioids and adjunctive medications, may be seen as "rational pharmacotherapy" and may provide a stable therapeutic platform from which to base treatment changes.

E is for education for multidisciplinary health-care professionals to include behavioral health professionals, patients, and patient caregivers. It is paramount that a dialogue be fostered so that expectations of opioid therapy can be appreciated by all of the parties.³³⁻³⁷ It is crucial for patients to understand that the goal of postoperative pain management, as asserted by Varley and Zuckerbraun,⁴⁶ is not to be pain-free but to make the pain manageable in the context of a patient's daily activities during recovery. Opioid stewardship programs promote and enhance patient and family caregiver education and engagement. One tool to assist in enhancing patient education is control substance agreements because such agreements promote communication between patients and providers, thus creating an open and honest dialogue as to everyone's expectations of a treatment plan. Last, integrating opioid stewardship and opioid analgesic prescribing using protocols and directives specifically tailored to patients with OUD and SUD will prevent treatment failure, addiction, and opioid overdose.²⁵⁻³²

Conclusions

It is hoped that the lower-extremity specialist appreciates that thoughtful management of acute perioperative pain among patients receiving medication abstinence therapy for OUD is critically important given the risks of destabilization during the perioperative period. The literature reveals the lack of rigorous evidence on acute pain management in patients taking medication for OUD; however, evidence supports the practice of continuing methadone or buprenorphine for most patients during acute pain episodes. Furthermore, this specialist should come to realize that maintaining abstinence therapy and using an individualized, multimodal, and multidisciplinary approach to analgesia are key components of successful strategy. Last, more research on ideal perioperative analgesic therapy along with medication abstinence therapy is needed to further optimize perioperative strategies for acute pain management for patients with OUD who need lower-extremity surgical or procedural interventions.

Financial Disclosure: None reported.

Conflict of Interest: None reported.

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