Iatrogenic Opioid Dependence in the United States

Are Surgeons the Gatekeepers?

Jennifer F. Waljee, MD, MS, Linda Li, BA,† Chad M. Brummett, MD,‡ and Michael J. Englesbe, MD§*

(*Ann Surg* 2017;265:728–730)

Opioid-associated morbidity and mortality are described by the Centers for Disease Control as a national "prescription painkiller overdose epidemic."[1] Today, 1 of every 25 adults regularly uses prescription opioid medications. Prescription opioid use results in greater healthcare utilization and associated expenditures, as well as increased rates of morbidity and mortality owing to unintentional overdose, misuse, abuse, and transition into heroin use.[2,3] Nonetheless, one of the most common episodes for opioid prescribing is during the perioperative period, and opioids remain the cornerstone of postoperative pain management.

The current opioid epidemic has evolved on the basis of the regretful claims, supported by pharmaceutical companies, that pain is undermedicated and the addictive potential of opioids is overstated. In addition, there are no guidelines to direct surgeons regarding outpatient opioid prescribing. Clinical standards are available regarding the inpatient management of postoperative pain, such as the use of regional or patient-controlled anesthesia techniques, but do not refer to outpatient care.[4] Recent guidelines have been published regarding the use of prescription opioids for chronic pain, but primarily target clinicians in emergency and primary care.[5] Current surgical training curricula do not include the management of chronic pain in standard competencies, and this is not included in annual residency in-training examinations, board certification examinations, or maintenance of certification examinations. Finally, the extent to which prescribing practices are influenced by convenience, knowledge, and cultural factors is unclear.

The patient factors driving postoperative pain intensity and opioid consumption are complex, including central sensitization, psychosocial, and cultural factors.[6,7] Recent evidence suggests that patients may continue to use opioids to manage symptoms and comorbidities beyond pain in the surgical area. For example, among patients undergoing knee and hip arthroplasty, chronic opioid use was significantly correlated with greater preoperative global body pain and catastrophizing, but was not associated with the change in the knee or hip pain.[6,7] Characteristics of fibromyalgia or centralized pain have been shown to be associated with increased opioid consumption after surgery, which is likely because of opioid nonresponsiveness and distinct from negative effect or catastrophizing. In addition, opioid use is not correlated with surgical site pain among patients with mood disorders, suggesting that patients may rely on opioids to manage the symptoms and sequelae of other psychological conditions.[6]

The lack of evidence-based guidelines and risk-stratification to tailor postoperative opioid prescribing has also contributed to an excess of opioid pills within our patients' homes and communities. For example, roughly 80% of opioid prescriptions filled remain unconsumed, and patients are frequently left with excess pills for which disposal options are challenging to navigate.[8] Excessive prescribing creates the potential for diversion to unintended users for nonmedical abuse, and nearly 75% of recent heroin users report being introduced to opioids through prescription medications.[9] Current opioid disposal options are limited to authorized opioid collectors, including selected law enforcement agencies pharmacies, or organized pill drop events, and many patients remain unaware of these avenues.[10]

Finally, the majority of current preoperative efforts to improve perioperative safety and quality are centered on the reduction of common complications, such as venous thromboembolism and surgical site infections. Such efforts have been markedly successful, and morbidity and mortality rates in the United States following major surgery are low. Nonetheless, iatrogenic opioid dependence could now be considered a postoperative complication of equal magnitude, and 1 of every 20 opioid-naive patients continues to require opioids long after their surgical care is complete.[11,12] Current initiatives directed at reducing prescription opioids have focused on nonmedical use, as well as secondary (eg, early identification of opioid abuse) and tertiary prevention (facilitating treatment for opioid abuse) strategies. Although such interventions are easy to implement and have high face validity for clinicians in practice, they miss the opportunity to prevent opioid-naive patients from moving beyond acute use to opioid dependence and to curb excess opioid prescribing.[13]

TOWARD SAFER POSTOPERATIVE OPIOID PRESCRIBING

The scope and complexity of the current opioid epidemic demands a multifaceted approach that targets the needs of providers and patients. Programs that allow surgeons to tailor postoperative opioid prescriptions based on key patient factors could minimize opioid excess while maintaining adequate analgesia for patients at high risk for pain and opioid consumption beyond normative values. More specifically, defining ranges for acceptable opioid prescribing with respect to quantity, duration, and type of opioid could reduce opioid excess, avoid the inappropriate use of long-acting formulations for acute surgical pain, and signal patients at high risk for

From the *Department of Surgery, Section of Plastic Surgery, University of Michigan Medical Center, Ann Arbor, MI; †University of Michigan Medical School, Ann Arbor, MI; ‡Department of Anesthesia, University of Michigan Medical Center, Ann Arbor, MI; and §Department of Surgery, Section of Transplant Surgery, University of Michigan Medical Center, Ann Arbor, MI.

Disclosures: J.W. receives research funding from the Agency for Healthcare Research and Quality (K08 1K08HS023313–01), the American College of Surgeons, and the American Foundation for Surgery of the Hand; serves as an unpaid consultant for 3 M Health Information systems. C.M.B. receives research funding from the National Institutes of Health, NIAMS R01 AR060392 and NIDA 1R01DA038261–01A1, as well as the University of Michigan Medical School Dean's Office (Michigan Genomics Initiative). C.M.B. also serves as a consultant for Tonix Pharmaceuticals (New York, NY), and receives research funding from Neuros Medical Inc. (Willoughby Hills, OH).

The authors report no conflicts of interest.

Reprints: Jennifer F. Waljee, MD, University of Michigan Health Systems, 2131 Taubman Center, Ann Arbor, MI 48109-5300. E-mail: filip@med.umich.edu.

ISSN: 0003-4932/16/26504-0728

DOI: 10.1097/SLA.0000000000001904

prolonged opioid use who may benefit from more aggressive opioid alternative pain management regimens.

From the patient perspective, interventions that leverage motivational and cognitive behavioral strategies to improve resilience, self-efficacy, and expectations are effective in the setting of chronic pain management, and could be applied to perioperative care.[14] A multidisciplinary approach that leverages the broad expertise of anesthesiologists, primary care providers, psychologists, psychiatrists, social workers, communications experts as well as surgeons can further inform effective strategies to tailor postoperative regimens to include opioid alternatives, and streamline care for patients who struggle with dependence during the postoperative period. In this context, strategies that promote improved mood, stress management, and self-efficacy as well as technical information (nonopioid alternative medications, opioid risks, safe-disposal, etc) will provide an important avenue for pain relief without opioids.

The Michigan Opioid Prescription Engagement Network (Michigan-OPEN)

The state of Michigan serves as a home to a unique network of Continuous Quality Improvement (CQI) programs and clinician communities, and is uniquely poised to address the prescription opioid crisis (Fig. 1). Funded by Blue Cross and Blue Shield (BCBS) of Michigan, 22 physician-led networks are devoted to improving the care of patients in Michigan, and represent all major hospitals and surgical specialties. For example, the Michigan Surgical Quality Collaborative includes the 73 Michigan hospitals that perform major inpatient general and vascular surgery procedures. We will build upon a robust data infrastructure that enables detailed clinical data collection, best practice identification, and rapid dissemination. More importantly, these CQIs have an established culture of trust and cooperation that enables change. Our efforts focus on education, measurement, improvement and engagement.

Education

Quarterly CQI meetings are a powerful platform to make opioid best practices a priority for all surgeons. We will present data regarding the opioid epidemic in Michigan at CQI meetings to raise awareness, provide feedback over time, and determine new strategies to improve practice. We will create both patient- and provider-facing interventions that are designed to detail the risks of opioids, behavioral and pharmacologic opioid alternatives, and safe opioid disposal and storage practices. We will identify surgeon, anesthesiology, and primary care champions to partner together to identify at-risk patients before surgery, develop best practices, and streamline transitions of care.

Measurement

Building on current data platforms, we will establish a patient-centered data infrastructure that integrates patient-reported outcomes (eg, pain, satisfaction), patient utilization of postoperative opioids, and surgeon care practices. In this way, we will create tools that identify patients at risk for prolonged postoperative opioid use, and smooth the transition between primary care providers and surgeons, particularly among patients who are most vulnerable. Furthermore, we will demonstrate the effectiveness of our interventions through the measurement of patient-reported opioid consumption and physician prescribing patterns over time.

Improvement

Eliminating the use prescription opioids altogether could potentially reduce the untoward risks of prescription opioids, including dependence and diversion to unintended users. However, prescription opioids are an effective intervention for acute pain following major surgery, and narrow policies may compromise the outcomes most valued by patients. In this multifaceted effort, we will provide continuous clinician feedback regarding patient-reported outcomes and prescribing practices to inform local improvement efforts that will demonstrate areas of improvement and opportunities for change. These data will inform an iterative implementation plan for each provider and institution, and opioid prescribing will be included as a standard quality metric for actionable change and improvement for each CQI program.

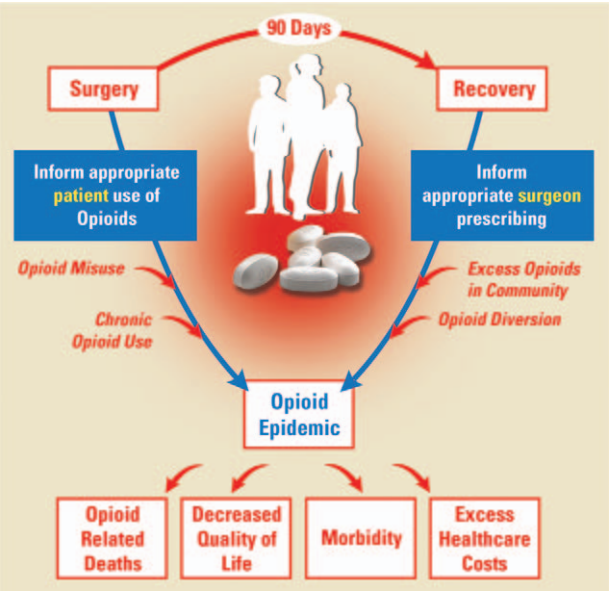

FIGURE 1. Michigan Opioid Prescribing Engagement Network (Michigan-OPEN).

Engagement

Pill drop programs are an important repository for patients to dispose of unused opioids. Based off of successful initiatives at our institution, we will partner with local community leaders and law enforcement to organize opioid pill drops at each participating MSQC hospital. We will develop self-sustaining programs at each hospital that will serve as an ongoing repository for opioids and reduce the number of pills in communities at risk for unintended diversion.

Deaths attributable to prescription opioids are a leading cause of accidental death in the United States, and have increased 5-fold over the last decade. Given the societal impact of opioid abuse and dependence, the unmeasured burden related to lost productivity and wages is substantially higher. Moreover, excess opioids that remain unconsumed are an opportunity for individuals to develop opioid dependence, and a pathway to substance abuse. Surgeons contribute to the excess of prescription opioids in our communities daily, and increase prevalence of opioid-dependent individuals. As such, we have a critical responsibility and opportunity to develop appropriate prescribing practices. Going forward, the Michigan Opioid Prescription Engagement Network (Michigan-OPEN) will provide a collaborative model to create innovative strategies to facilitate change and implement best practices.

REFERENCES

1. Centers for Disease Control and Prevention National Center for Health Statistics: Multiple Cause of Death 1999–2010, CDC WONDER Online Database. Data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program., 2015.
2. Ronan MV, Herzig SJ. Hospitalizations related to opioid abuse/dependence and associated serious infections increased sharply, 2002-12. *Health Aff (Millwood)*. 2016;35:832–837.
3. Jones CM, Logan J, Gladden RM, et al. Vital signs: demographic and substance use trends among heroin users - United States, 2002-2013. *MMWR Morb Mortal Wkly Rep*. 2015;64:719–725.
4. American Society of Anesthesiologists Task Force on Acute Pain Management. Practice guidelines for acute pain management in the perioperative setting: an updated report by the American Society of Anesthesiologists Task Force on Acute Pain Management. *Anesthesiology*. 2012;116:248–273.
5. Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain–United States, 2016. *JAMA*. 2016;315:1624–1645.
6. Brummett CM, Janda AM, Schueller CM, et al. Survey criteria for fibromyalgia independently predict increased postoperative opioid consumption after lower-extremity joint arthroplasty: a prospective, observational cohort study. *Anesthesiology*. 2013;119:1434–1443.
7. Janda AM, As-Sanie S, Rajala B, et al. Fibromyalgia survey criteria is associated with increased postoperative opioid consumption in women undergoing hysterectomy. *Anesthesiology*. 2015;122:1103–1111.
8. Bartels K, Mayes LM, Dingmann C, et al. Opioid use and storage patterns by patients after hospital discharge following surgery. *PLoS One*. 2016;11:e0147972.
9. Compton WM, Jones CM, Bladwin GT. Relationship between nonmedical prescription-opioid use and heroin use. *N Engl J Med*. 2016;374:154–163.
10. Reddy A, de la Cruz M, Rodriguez EM, et al. Patterns of storage, use, and disposal of opioids among cancer outpatients. *Oncologist*. 2014;19:780–785.
11. Clarke H, Soneji N, Ko DT, et al. Rates and risk factors for prolonged opioid use after major surgery: population based cohort study. *BMJ*. 2014;348:g1251.
12. Alam A, Gomes T, Zheng H, et al. Long-term analgesic use after low-risk surgery: a retrospective cohort study. *Arch Intern Med*. 2012;172:425–430.
13. Dart RC, Surratt HL, Cicero TJ, et al. Trends in opioid analgesic abuse and mortality in the United States. *N Engl J Med*. 2015;372:241–248.
14. Cherkin DC, Sherman KJ, Balderson BH, et al. Effect of mindfulness-based stress reduction vs cognitive behavioral therapy or usual care on back pain and functional limitations in adults with chronic low back pain: a randomized clinical trial. *JAMA*. 2016;315:1240–1249.