

Risk of Prolonged Opioid Use Among Opioid-Naïve Patients Following Common Hand Surgery Procedures

Shepard P. Johnson, MBBS,* Kevin C. Chung, MD, MS,† Lin Zhong, MD, MPH,‡
Melissa J. Shauver, MPH,† Michael J. Engelsbe, MD,‡ Chad Brummett, MD,§
Jennifer F. Waljee, MD, MPH†

Purpose To evaluate prolonged opioid use in opioid-naïve patients after common hand surgery procedures in the United States.

Methods We studied insurance claims from the Truven MarketScan databases to identify opioid-naïve adult patients (no opioid exposure 11 months before the perioperative period) who underwent an elective (carpal tunnel release, carpometacarpal arthroplasty/arthrodesis, cubital tunnel release, or trigger finger release) or trauma-related (closed distal radius fracture fixation, flexor tendon repair, metacarpal fracture fixation, or phalangeal fracture fixation) hand surgery procedure between 2010 and 2012 (N = 77,573 patients). Patients were observed for 6 months to determine the number, timing, duration, and oral morphine equivalent dosage of postoperative opioid prescriptions. We assessed prolonged postoperative opioid use, defined as patients who filled a perioperative opioid prescription followed by a prescription between 90 and 180 days after surgery, and evaluated associated risk factors using multivariable logistic regression.

Results In this cohort, 59,725 opioid-naïve patients (77%) filled a perioperative opioid prescription. Of these, 13% of patients continued to fill prescriptions between 90 and 180 days after surgery. Elective surgery patients were more likely to continue to fill opioid prescriptions after 90 days compared with trauma patients (13.5% vs 10.5%). Younger age, female gender, lower income, comprehensive insurance, higher Elixhauser comorbidity index, mental health disorders, and tobacco dependence or abuse were associated with prolonged opioid use.

Conclusions Approximately 13% of opioid-naïve patients continue to fill opioid prescriptions after hand surgery procedures 90 days after surgery. Preoperative interventions centered on opioid alternatives and early cessation, particularly among patients at risk for long-term use, is critical to addressing the prescription opioid crisis in the United States.

Clinical relevance The current national opioid use epidemic requires an assessment of the prevalence of hand surgery patients who receive and fill opioid prescriptions after common hand surgery procedures. (*J Hand Surg Am.* 2016;41(10):947–957. Copyright © 2016 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Hand surgery, opioid-naïve patients, prescription opioids, prolonged opioid use.



From the *Department of Surgery, St. Joseph Mercy Ann Arbor; and the †Department of Surgery, Section of Plastic Surgery; ‡Department of Surgery, Section of Transplant Surgery; and §Department of Anesthesiology, University of Michigan Health System, Ann Arbor, MI.

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Corresponding author: Jennifer F. Waljee, MD, MPH, Department of Surgery, Section of Plastic Surgery, University of Michigan Health System, 2130 Taubman Center, SPC 5340, 1500 East Medical Center Drive, Ann Arbor, MI 48109-5340; e-mail: filip@med.umich.edu.

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OPIOID MEDICATIONS ARE MORE commonly prescribed in the United States than in any other country.¹ Deaths from opioid analgesics have increased nearly fourfold from 2001 to 2014, and prescription opioids account for more overdose mortalities than any other drug at approximately 19,000 deaths/y.^{2–8} In addition to increasing morbidity and mortality rates, expenditures related to the prescription opioid drugs are estimated at \$50 billion/y.⁹ Opioid analgesics have been established as an integral component of treating postsurgical pain in the United States but they have important adverse effects, including the risk of developing long-term opioid use.^{10–16}

The Centers for Disease Control and Prevention caution that long-term opioid use often begins with treatment of acute pain.¹¹ Although they are beneficial for perioperative pain control, the effectiveness of prescription opioids in managing chronic pain is less clear.^{11–14} Surgeons are among the highest prescribers of opioid medication and the use of opioids for postsurgical pain continues to increase in popularity.^{12–20} For example, Wunsch et al¹⁶ recently found that after carpal tunnel release, both the percentage of patients filling prescriptions and the mean oral morphine equivalent (OME) dose prescribed increased over time. In addition, recent evidence suggests that a substantial number of patients who receive opioids for common procedures struggle to transition to non-opioid analgesics.^{12,13}

Given the widespread use of postoperative opioid analgesics, identifying patients at risk for prolonged opioid use is an important avenue for prevention and intervention.^{21,22} Although upper-extremity procedures are among the most common ambulatory procedures performed in the United States, little is known about the risk of long-term opioid use after surgery. We performed a population-based study using health care claims from the Truven MarketScan database to examine the risk of developing prolonged opioid use in opioid-naïve patients undergoing common elective and trauma-related hand surgery procedures performed for upper-extremity conditions in the United States.

MATERIALS AND METHODS

Data source and study sample

We analyzed the Thomson Reuters Truven MarketScan Commercial Claims Research Database, which includes data from inpatient, outpatient, and pharmacy services from a range of employer-based health plans.²³ This database includes information on health care use of more than 50 million active employees, early retirees, patients aged older than 65 years with Medicare Advantage or supplemental insurance (but

not primary Medicare patients), and their dependents. We classified patients aged 18 or older, who did not carry a diagnosis of opioid dependence or abuse (International Classification of Diseases–9 [ICD-9] 304.00–304.02 and 305.5–305.53),^{12,13} and who did not fill an opioid prescription between 1 and 12 months before surgery, as opioid-naïve.

All patients had a single Current Procedural Terminology code for an elective (carpal tunnel release, carpometacarpal (CMC) arthroplasty/arthrodesis, cubital tunnel release, or trigger finger release) or trauma-related (closed distal radius fracture [DRF] fixation, flexor tendon repair, metacarpal fracture fixation, or phalangeal fracture fixation) hand surgery procedure between January 1, 2010 and December 31, 2012. These interventions were selected because they are among the most common operations performed by hand surgeons for elective and trauma-related indications. Only patients with isolated injuries were included in the trauma group. We excluded patients without continuous enrollment during the study period to ensure complete data collection. Appendix A (available on the *Journal's* Web site at www.jhandsurg.org) provides a list of ICD-9 and Current Procedural Terminology codes that were used to identify our diagnoses and claims of interest, including the diagnoses collected under the categories of mental health disorder, history of pain, and substance abuse. Patient data for this study were deidentified and therefore were deemed exempt from review by the institutional review board at our local institution.

Patient factors

Sociodemographic data collected included age, sex, regional median income, insurance plan, and Elixhauser comorbidity index score to assess comorbid conditions.²⁴ We used the scoring system of van Walraven et al²⁵ for the Elixhauser comorbidity index, which reports a single numeric comorbidity score to summarize overall disease burden. This score is validated for use in large administrative databases and is associated with mortality and health service measures (eg, length of hospital stay). Insurance plans were classified into preferred provider organization, comprehensive insurance, health maintenance organization, point of service, and other (non-categorized) insurance plans. We also collected ICD-9 diagnosis for conditions known to increase the risk of opioid abuse, including mental health disorders, pain disorders, and substance dependence or abuse.

Outcomes

Opioid medications: Patients included in the study had no opioid exposure 1 year before surgery, excluding the

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