How one state beat national surgery opioid trends

March 24 2023

Credit: CC0 Public Domain

A statewide effort to treat the pain of surgery patients without increasing their risk of long-term dependence on opioids has paid off in Michigan, a study shows.

In less than two years, the effort led to a 56% reduction in the amount of opioids patients received after having six different common operations, and a 26% drop in the chance that they would still be filling opioid prescriptions months after their surgical pain should have eased.

Both of those drops beat national trends for similar patients, according to the new study published in *Annals of Surgery* by a team from Michigan Medicine, the University of Michigan's academic medical center.

Michigan patients having certain operations—for instance, to remove part of their colon—saw the biggest drops over the study period in how many opioids they received after their operations. They also had the biggest drop in risk of developing persistent opioid use, which the researchers define as filling opioid prescriptions for months or years after surgery, when their initial surgery-related prescription was intended for short-term use.

The Michigan effort used prescribing guidelines based on real-world evidence about how many opioid doses surgery patients actually need to ease their pain, compared with what they were prescribed.

Importantly, the guidelines don't leave patients in pain. In fact, past research showed that surgery patients receiving smaller opioid prescriptions had similar pain outcomes and were just as satisfied with their pain care.

"Tens of millions of people have operations in the U.S. every year, and most of them go home with a prescription for an opioid painkiller. Although they are meant for short-term use during recovery from surgery, unfortunately, some patients keep filling opioid prescriptions for months or years after surgery, which raises their risk of opioid use disorder, overdose, and death," said Ryan Howard, M.D., M.S., the resident in the U-M Department of Surgery who led the new analysis.

"Reducing those trends is a key part of addressing our national opioid problems."

A statewide team effort

The achievement was driven by the Opioid Prescribing Engagement Network and the Michigan Surgical Quality Collaborative—both based at U-M—and by surgical team leaders at 70 hospitals across the state that take part in MSQC and have implemented OPEN guidelines.

"Our study shows how voluntary prescribing guidelines, and involvement of surgical teams in choosing evidence-based pain care options, can really make a difference," said senior author Chad Brummett, M.D., co-director of OPEN and director of pain research at Michigan Medicine's Department of Anesthesiology. "Fewer opioids prescribed and dispensed means lower risk not only of persistent use, but also of risks to others in the household from unused opioid medication."

Helping patients get leftover opioids out of their homes and disposed of safely is another key goal of the opioid prescribing engagement network. They offer several free programs to Michigan organizations including free medication disposal pouches, permanent disposal boxes and medication take back event planning materials.

Making Michigan the safest place for surgery

The team showed that declines in Michigan—where these guidelines were implemented—outpaced the nation, and other Midwest states, by comparing records from tens of thousands of patients who had the six types of operations in Michigan and those who had them in other states.

Their analysis spans almost four years before the prescribing guidelines

were deployed statewide, and nearly two years afterward, from 2013 to mid-2019.

They focused on patients covered by traditional Medicare, who had not filled an opioid prescription for a year before their operation, and who had not had a second operation in the six months after their index operation.

The study focuses on nearly 25,000 Michigan patients and more than 118,600 non-Michigan patients who had minimally invasive gallbladder removal or appendix removal, minor or major hernia repairs, removal of part of the colon (colectomy), or hysterectomy.

Those six types of operations were the first ones that focused on when developing and implementing prescribing guidelines based on opioid prescription fills and surveys of patients undergoing surgery. They were first published in October 2017, and have been added to ever since with guidelines for other types of surgical and dental procedures. The opioid prescribing engagement network recently published its first pediatric surgery prescribing guidelines.

The 70 hospitals across Michigan where the guidelines were deployed account for the majority of surgical care in the state. The non-Michigan patients were a 20% sample of all traditional Medicare patients who had the same operations in the same timeframe.

The researchers looked for signs of new persistent use of opioids, which means a patient filled an opioid prescription immediately after surgery, and then also filled at least one more opioid prescription in the three months after surgery, and another up to six months after surgery. They also looked at the total amount of opioids that patients received in the six months after their operation.

Because opioid prescribing in general was trending downward in the mid-2010s, the researchers looked at differences between Michigan and national trends to see if there was any difference.

Michigan outperforms the nation

Michigan patients had a larger decrease in the rate of new persistent opioid use than their non-Michigan counterparts, with the two drops differing by about half a percentage point.

This was driven especially by a 2.76 percentage-point reduction among those having colon surgery, and smaller but significant reductions among those having gallbladder and minor hernia operations. Patients having other operations had either no difference between Michigan and the rest of the nation, or a slight increase in Michigan for appendectomy.

On the whole, Michigan surgical patients saw a faster drop in the size of the opioid prescriptions they filled, compared with those in other states having the same operations in the same time period.

The difference was nearly 56 mg of opioids by the end of the study period, with significant drops in all types of surgery except laparoscopic appendectomy. Michigan patients started at about 200 mg morphine equivalents, and dropped to 89 mg morphine on average, while non-Michigan patients started at 218 mg morphine and dropped to 154 mg morphine.

The size of dispensed opioid prescriptions to Michigan surgical patients was actually already lower than national surgical opioid prescribing before the guidelines, though persistent opioid use after surgery was higher in Michigan at 3.4% compared with 2.7%.

When the researchers excluded cancer patients, or patients with

substance issues, Michigan still outperformed the rest of the country in decreasing persistent use and reducing the size of prescriptions dispensed to patients.

Michigan's colon surgery patients had the biggest drop in both the amount of opioids they received and their chance of developing persistent use.

The researchers also did additional comparisons of Michigan with a group of Midwestern states, and with Indiana and Wisconsin, as well as doing analyses that excluded cancer patients and patients who had previously been diagnosed with a substance use disorder. In all these cases, Michigan performed better than the nation.

In addition to Howard and Brummett, the study's authors are Andrew Ryan, Ph.D., formerly of the U-M School of Public Health, Hsou Mei Hu, Ph.D., M.B.A., of OPEN; Craig S. Brown, M.D., M.S., of Surgery; and OPEN co-directors Jennifer Waljee, M.D., M.P.H., M.S., Mark Bicket, M.D., Ph.D. and Michael Englesbe, M.D. Many of the authors are members of IHPI and the Center for Healthcare Outcomes and Policy.

More information: Ryan Howard et al, Evidence-Based Opioid Prescribing Guidelines and New Persistent Opioid Use After Surgery, *Annals of Surgery* (2023). DOI: 10.1097/SLA.0000000000005792

Provided by University of Michigan