New studies show progress and opportunity with opioid painkiller usage and risk

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Having surgery means placing complete trust in a team of professionals, and counting on them to fix what's wrong while keeping surgical risks as low as possible.

But one of those risks, surgery experts have begun to realize, has nothing to do with what happens in the operating room. Instead, it has to do with treating post-surgery pain without raising the chance that the patient will get hooked, or more dependent, on opioids.

It's a risk that affects a minority of patients—maybe 1% to 10% at most, depending on the operation. But it's not easy to tell in advance which patients will continue to seek opioid painkiller refills months after their surgery pain should have subsided.

Meanwhile, patients who already took opioids for pain before their operation face other risks from increased doses taken after surgery.

A wave of new studies led by surgeons and trainees at Michigan Medicine, the University of Michigan's academic medical center, add to the understanding of these risks. They also show what happens when surgical teams work together to reduce the emphasis on, and supply of, opioid painkillers while still seeking to ease surgery patients' pain.

Sustained success

It's already been several years since a U-M team published some of the first evidence about the risks of long-term post-surgical opioid use. The team also took the novel step of contacting patients to find out how many opioid pills they had actually taken for their surgical pain, compared with what they'd been prescribed.

That led them to develop prescribing guidelines for sharp reduction in opioid prescribing, and use of other pain medications and patient education. They formed the Michigan Opioid Prescribing and Engagement Network, or Michigan OPEN, to help spread the word about the guidelines and about the need for proper disposal of leftover pain medicines to keep them from being diverted to recreational use.

A trial of the guidelines at Michigan Medicine's hospitals showed opioid prescribing declined without increasing patients' pain. That was enough to convince dozens of hospitals across the state of Michigan to adopt the guidelines, and work together to refine them, through the Michigan Surgical Quality Collaborative funded by Blue Cross Blue Shield of Michigan.

Now, a new paper published in *BMJ Quality & Safety* shows the long-term effects of that statewide effort. It includes data from 36,022 patients who received a prescription for an opioid painkiller to help them with the pain associated with one of 9 operations between February 2017 and May 2019 in 69 hospitals across Michigan.

In all, the average surgical opioid prescription size was cut in half over this time, from an average of 30 tablets to about 15. The amount of opioids patient took from those prescriptions also dropped, from an average of 13 tablets to an average of 6, and the percentage of patients who sought a refill for their opioid prescription went down.

Despite the reduction in prescribing and consumption, there was no increase in the amount of pain patients reported in follow-up surveys, or decrease in their satisfaction with their surgery experience. These follow-up data are available for more than 15,000 of the patients.

Prescribing was more in line with guidelines instead of varying greatly by surgeon and procedure, especially for less commonly performed operations that had previously varied widely.

"This project illustrates the power of engaging and empowering physicians, nurses, and other healthcare workers across the state to help improve care for all of our patients," says Craig Brown, M.D., the general surgery resident who is the first author of the new paper. "There's still room to improve opioid prescribing, but teamwork like that

exhibited through this MSQC and M-OPEN partnership has made a lasting impact on post-operative prescribing and made a huge difference in our communities."

Surgery professor Michael Englesbe, M.D., who co-leads Michigan OPEN and leads MSQC, is the study's senior author. "We are fortunate in Michigan that our physicians, nurses, state policy makers, and major private payer are able to partner, coordinate efforts and rapidly improve care for patients in our State," he says.

Opioids and hernia surgery

Every year, nearly 800,000 Americans—most of them men—have surgery for the most common kind of hernia, called an inguinal hernia. And according to results of a new study, about 12,000 of them might end up using opioid painkillers long-term, months after the pain from their operation should have subsided.

The study led by U-M surgery resident Ryan Howard, M.D., and surgery associate professor Dana Telem, M.D., M.P.H., is published ahead of print in the Annals of Surgery. It looked at national data on hernia operations done from 2008 to 2016, on patients who got their insurance through a major private insurer including through jobs and Medicare Advantage plans. It only included patients who were "opioid-naïve," meaning they were not already using opioid at the time of surgery.

The team found that of all the patients who received an opioid prescription around the time of surgery, 1.5% of these patients continued refilling opioid prescriptions for at least 3 months after their hernia repair. This means that these patients are continuing to use opioids—medications that carry many risks -long after the surgical pain should have subsided. While this is a lower percentage than those seen in other studies of post-surgery chronic opioid use, it's still concerning

because the operation is so common, the authors say.

A critical finding of this study was that patients who filled an opioid prescription in the month before their operation were four times more likely to become persistent opioid users after surgery. Importantly, over half of these preoperative prescriptions were provided by surgeons. The study team believes this may reflect the practice of "convenience prescribing," where a provider makes sure a patient has their prescription filled and ready before they even have their operation. Given that this dramatically increases the risk of persistent opioid use, it may be time for surgeons to abandon this practice.

Additionally, patients who had a major complication of their operation, or who had anxiety, disruptive mood disorder, alcohol or substance abuse disorders or pain disorders were more likely to go on to become chronic opioid users.

Opioids after cancer surgery

One of the key goals of surgical opioid prescribing research is to "right size" the painkiller prescriptions that patients receive before or immediately after their operations so that they have the pills they need to control their pain once they get home, but don't have so many that leftovers pose a risk to them or someone in their household.

A new study in the *Journal of Surgical Oncology* by a team led by U-M medical student Nicholas Eyrich, M.S., and general surgery chief resident Jay S. Lee, M.D., shows what breast cancer and melanoma surgery patients at a major medical center actually reported receiving and using.

They interviewed 439 patients within a few months of their operation, and found that on average patients took just two of the opioid tablets

they were prescribed, no matter what operation they had or whether they received a prescription of 5, 10 or 20 tablets.

While the vast majority of patients said they received instructions for taking opioids, less than half said a member of the care team had talked with them about using non-opioids first or about the risk of addiction to opioids. Less than a third said they were told about the risks of having unused opioids in the home, and only a quarter said they had discussed safe disposal of unused opioids with a member of the care team.

Persistent use leads to higher costs

Another new paper, led by Lee and Michigan OPEN co-leader and plastic surgeon Jennifer Waljee, M.D., M.P.H., M.S., shows that patients who become persistent opioid users for the first time after surgery cost the health system more.

Writing in the *Annals of Surgery*, they report data from more than 133,000 people nationwide who did not take opioids before they had surgery, of whom 8,100 continued refilling opioid prescriptions for months after their operations.

The average health care bills for each of those patients were $2,700 higher than for those who didn't develop persistent use. The increased spending kept going for at least six months after surgery, at an average rate of $200 a month.

Outpatient surgery risks for those already taking opioids

Older patients who take high doses of opioids, and then go on to have outpatient operations, are more likely to die within a few months of

surgery than those who weren't taking opioids, according to a recent study published in *JAMA Surgery*.

The team, led by Katherine Santosa, M.D., M.S., U-M chief resident in plastic surgery, and Waljee, looked at data from Medicare enrollees over 65 who had common outpatient procedures between 2009 and 2015. They included people who had gallbladder, thyroid, hernia, carpal tunnel, hemorrhoid, varicose vein and prostate surgery, among others.

The team did the study because opioid use is known to be associated with falls, fractures and breathing issues in older adults, especially those who also take medications called benzodiazepines for anxiety or sleep issues.

Although only a small percentage of patients died within 90 days of their outpatient operation—just 471 of the more than 99,000 studied, or 0.5% - the researchers were able to see a difference based on opioid use. It was visible even after adjusting the results for differences in age, sex, race, type of surgery, and multiple measures of health.

The authors call for more attention to be paid to the risks of surgery for people who take opioids on a long-term basis, especially those taking higher doses. Helping them reduce their opioid use before their operation could reduce their risk, and also help them respond better to any opioids prescribed for pain control after surgery. The authors also note that prescribing naloxone, a drug that can "rescue" someone from an opioid overdose, might be wise.

More information: Craig S Brown et al, Assessment of a quality improvement intervention to decrease opioid prescribing in a regional health system, *BMJ Quality & Safety* (2020). DOI: 10.1136/bmjqs-2020-011295

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