

Tessnim Ahmad:

Welcome to The Spark: Medical Education for Curious Minds. We present the people and stories behind medical advances at UCSF, from medical students, to physicians and faculty in the School of Medicine. Through The Spark, we share the innovations at UCSF that are helping bring more equitable and better care to our communities.

I'm Tessnim Ahmad, a student in the school of medicine. In this episode, we talk about the opioid epidemic.

Opioids are at the center of one of the largest public health crises. You've likely heard the statistics. You may even know someone with an opioid use disorder or someone who died from an overdose. In 2017, more than 47,000 people overdosed and died on opioids, 11 million misused prescription opioids, and two million had an opioid use disorder.

Opiates have been used for centuries. They're derived from opium, a natural chemical in the poppy plant. They act by binding to receptors in the brain and spinal cord to relieve pain. They also stimulate the brain's reward centers to create a feel good effect described as a rush of euphoria and calmness. The brain also produces its own so-called endogenous opioids or endorphins, which it releases in response to exercise and pain. They bind to the same receptors as opioid drugs.

For years, scientists wondered how opioid drugs were so addictive. Interesting research from Dr. Von Zastrow's lab at UCSF published in *The Neuron* in 2018, should the opioid drugs uniquely activate receptors inside cells within a specific cell structure called the golgi apparatus. While the cellular mechanisms underlying opiate addiction are beyond the scope of this podcast, it seems that opioid drugs may stimulate reward centers in a way that can't be achieved naturally resulting in the high and why opioids are so addictive.

The opioid epidemic traces back to 1991. Up to this point, opioids were mostly used for severe pain, often in cancer patients. Pharmaceutical companies selling the drugs, began marketing them for use in patients without cancer. They reassured the medical community the risk of addiction was low. As opioid prescriptions increased so did opioid-related deaths by the turn of the century, a majority of patients using opiates did not have cancer.

By 2010 efforts to decrease opioid prescriptions were underway, making them harder to get. People turned to heroin, which was cheap and widely available. In 2013 another uptick in deaths was observed, this time due to a potent synthetic opioid called fentanyl.

It's easy to see why this is a public health crisis. People are dying from a preventable cause with an economic burden in the tens of billions of dollars and physicians invariably have a role. Prescription opioid use is a known risk factor for opioid use disorder. Four in five new heroin users started with prescription painkillers. This is much different from the 1960s when most heroin users started with heroin. Opioid prescriptions have dropped in recent years. Physicians and researchers have tested interventions, large and small, to decrease opioid prescribing.

Dr. Stephanie Kwan worked on a quality improvement project to reduce postoperative opioid use as a UCSF medical student. She graduated last week and will start a preliminary year in general surgery at UC Davis. Dr. Wen Shen is an associate professor of clinical surgery, specializing in endocrine disease and was Stephanie's mentor for this project.

Dr. Shen's research focuses on the molecular biology and genetics of thyroid cancer, but as a surgeon who manages patients from the preoperative period to months and years following surgery, he's also interested in pain management and ways to reduce opioid use and minimize risks. I spoke with them about their research.

Your project launched with the observation that 84% of patients undergoing endocrine surgery at UCSF received an opioid prescription after surgery. Is there a comparison or normal rate and what are some factors that might contribute to differences in rates of opioid prescriptions within or between specialties?

Dr. Stephanie Kwan:

So actually within the endocrine surgery population, the rate actually ranges from about 84 to 97%, so actually kind of within this normal range. But thinking about it overall, the rates of actually opiate prescription can really depend on certain things such as the type of surgery, the length of surgery. So of course, in some specialties, such as orthopedic surgery, the rates of opioid use are a lot higher.

However, if you look at the rate of prescription of opiod use, it can be very variable really depending on the surgeon themselves, their experience. And research that has looked into kind of correlating it with factors, they've all been kind of contradictory to each other. Some of them they're either not statistically significant or there isn't a very strong association between patient factors, such as cancer diagnosis or smoking, or the operation itself.

Tessnim Ahmad:

Dr. Shen, given what we know about most addictions starting with prescription opioids, I'm curious about your followup of these patients. Did most actually take the opioids they were prescribed and were you able to follow them long enough to know whether this level of prescribing resulted in a higher risk of developing opiate misuse down the line?

Dr. Wen Shen:

We, over the years, had not really noticed that there were any bad outcomes of the medications. It was actually more the opposite where most people would tell us, "I didn't use them at all." And that was always positive, but the thing we did not do over the past decade or more was to step back and say, "Well, if that's the case, why are we even prescribing them?"

And the thing that I think came into view pretty quickly in doing this study was that we just said, "This is how it's always been done." And I think a lot of the prescriptions, in fact, I would say almost all of the prescriptions are being written out by residents and fellows who have been kind of signed out a certain protocol for how to take care of our patients and it just was never questioned.

Tessnim Ahmad:

Now your project looks at the efficacy of an intervention before surgery to reduce postoperative opioid use. Can you tell us about this intervention?

Dr. Stephanie Kwan:

Okay. Yeah. So this intervention that we kind of decided on was actually kind of a two pronged approach. So the one prong of it was this patient education handout, and this intervention was actually created in conjunction with the department of anesthesia. So specifically the attendings were Dr. Christy Inglis-Arkell, Dr. Solmaz Manuel and a resident, Dr. Andrew Lee.

So they created this patient education handout that really included setting expectations for pain management. Kind of emphasizing that we wouldn't necessarily fully remove a patient's pain, but mostly just be able to control it so that they can tolerate it and be able to go back to their daily lives. But also they of course mentioned these non-medication pain management strategies such as the ice packs, heat

packs. As well as kind of a description of the various pain medications, which included the non opiate pain medications and what they were used for and kind of emphasizing that we want to avoid the opioid medications because of the various side effects or potential adverse events that can come from it.

So this patient education handout was the first part of it and this was provided at the preoperative clinic visits or on the day of surgery to the patients. It wasn't just given to them, usually had someone, either a resident or one of the medical staff go over the handout with them just to make sure that the patient can get this education as well. Because I think that an important part of this is also managing people's expectations about their pain, as well as letting them know that this is what we will be doing for you. Kind of giving them this pain management plan.

Then the second part of it was standardizing provider prescriptions regarding postoperative pain medication or pain management. So they mostly agreed to discontinue routine opioid prescriptions as well as standardizing the various amounts of the non-opiate medications, such as acetaminophen and Tylenol.

Tessnim Ahmad:

What did you find?

Dr. Stephanie Kwan:

Yeah, so these are all mostly preliminary results that just because of the timing we haven't gotten more longterm results, but they have been very promising. So within about 70 patients, the postoperative opiate prescription rate was very low, actually 12%. So this was once again, down from 84%. the self-reported use of postop opiate use was actually even lower and we only had four patients or about 6% of the population that then self-reported use of post-op opiates.

Looking at patient satisfaction. We actually showed that 93% of patients were either satisfied or very satisfied with both the pain management, as well as the patient education aspect of it.

Additionally, looking at the average pain scores, this wasn't statistically significant, but if you just looked at the overall average pain scores, they were lower than previously as well, still ranging between one to two.

Tessnim Ahmad:

So a big drop in opioid prescriptions from 84 to 12% with pain levels unchanged, or even slightly improved. Dr. Shen being on the clinical side, what part or parts of the intervention do you think were most impactful for patients and has this project created any aha moments for you or other clinicians?

Dr. Wen Shen:

So I do think that the most important part of this has been managing patient expectations and letting them know upfront when you first meet them and describe the experience of what going through a thyroidectomy, a parathyroidectomy, some kind of surgical operation, what that experience is going to be like. And stating that most of the time patients are going to report very minimal incisional pain, and they might report more commonly things like a sore throat or a stiff neck. Things that are easily remedied with nonmedical or non-medication type interventions.

So I think if you tell them upfront, most of the people will go through the experience and say, "Yeah, that's pretty much exactly what was told to me." So I think very rarely, is there a significant disconnect between what you described to them and what they do experience and our data, I think would validate that.

In terms of kind of an aha moment, I think for the clinicians, the attending surgeons, it didn't really change any of our overall practice because we are not typically the ones writing the discharge medications, it's the residents and fellows. But a very simple kind of educational intervention and telling the residents and fellows, yeah, we're not going to be doing this as routine, has led to these incredible decrease in the number of prescriptions and then an actual decrease or improvement in terms of pain scores.

So this is an example, I think for me in medicine of a pretty cost low burden intervention that can have a tremendous impact for the healthcare system, for the patient experience. I think for just the overall kind of quality of our care. In some ways I do feel a little embarrassed or sheepish that we never really kind of sat down and questioned the status quo.

I joined the faculty here, joined an established practice back in 2007 and kind of just did a I'll have what he or she's having, kind of practice where I said, what are my partners doing? And this is kind of how we do things and we never really questioned some of these details, including the issue of opioids.

Now, one thing I think that also impacted our decision, our practice in the past and decision making over whether or not to give opioids is trying to avoid unnecessary phone calls. There's this perception that if you don't give them opioids, then you're going to get that middle of the night or weekend phone call from patients demanding the medications. As many know it can be very logistically difficult to get opioid prescriptions to a patient. They're very, very strict about the types of prescription methods and it needs to be validated, triplicate, electronic, et cetera. And so in trying to avoid those phone calls, we overprescribed for years and decades. If you kind of look at it really, since we've gone to this new opioid protocol, I would say it's very unusual and I think your data would bear this out. Very unusual for us to get these middle of the night or weekend emergency calls where we suddenly have to scramble to get a patient opioid medications.

So I think those fears were completely unjustified, but again, like many things in medicine, if you don't question it, if you don't try to look into what can be changed and they persist for years or decades. I think that's to the detriment of the system. So I'm very happy that this has kind of gone through. Again, my life hasn't changed very much at all in that I still do the surgery the same. I still treat the patients the same, but I'm much happier with the idea that there are fewer of those medications going around out there not being used and possibly ending up in places where they shouldn't be.

Tessnim Ahmad:

Now, this intervention was implemented among patients undergoing endocrine surgery and we know that endocrine procedures are less painful for patients than others, such as orthopedic surgery or spine surgery. Do you think this type of intervention or aspects of this intervention could be well suited to other surgical fields looking to decrease their opiate use prescribing?

Dr. Wen Shen:

I think as with what happened in our experience, I think managing patient expectations and then digging down on a granular level at the patient experience following these operations, what's the typical trajectory and what is the typical pain score and what is typical pain medication requirement and are there other non-opioid methods by which you can take care of some of these symptom complaints. I think already this is being rolled out in a variety of other specialties.

I know Elizabeth Lancaster, one of our research residents in the department of surgery has done a wonderful set of studies looking across our general surgery specialties. And looking at ways to have a similar effect in terms of reducing the number of opioid prescriptions that are being given out. I think

across other types of surgical specialties, this is also something that's been a very hot topic of research and quality improvement practices. And so it's something that I think we are witnessing right now, a real overhauling of the expectations and of the practice patterns for postoperative pain management.

Tessnim Ahmad:

There's this idea or stereotype even in the public that physicians may feel pressure to prescribe opiate medications to have happy patients and the research is mixed as to whether or not that's actually true. But what was your experience like implementing this intervention from the clinical side of interacting with patients.

Dr. Wen Shen:

On the patient experience side? I would say that most of the feedback that we've gotten when we queried them about opioid use after surgery, a lot of them actually are now trying to avoid it. They'll tell me upfront, even before we kind of go into the description of what their experience is going to be like, they'll say, I don't want any opioid medications. I think there has been a reasonable amount of press and a lot of media attention to this opioid epidemic and the lack of need for it in outpatient operations. I think it is getting through to some patients. And so I have been very impressed when people upfront, before I even go into my spiel about not needing them, they'll say, "I don't want any."

Same thing afterwards. I mean, occasionally a patient will request it in the short stay in the hospital that they'll need it, but very, very rarely after the operation, when they go home or when they come to their first postoperative visit, are they talking about any requirements. So I think the patients are buying in as well, and unless they have some very, very significant preexisting opioid use pattern it's not really been my observation that any of them are looking to use these medications in the hospital, or once they go home to recover.

Tessnim Ahmad:

Dr. Kwan, you'll start a preliminary year in general surgery at UC Davis in a few weeks. Can you share lessons learned from this project that you'll take with you as you move forward?

Dr. Stephanie Kwan:

I was just really surprised how so many people were involved within kind of the patient care that we had to make sure had input as well as kind of were really actually willing to implement this change that once we mentioned it to them that, oh, there's this high number of patients that we're giving these opiates to, but they're not actually using it. People were very receptive to being like, okay, what do we need to do to change that, so that we're not kind of contributing to this opiate epidemic and doing what's best for our patients.

So I think that's what really struck me that once you kind of provided this information and kind of give that push, I guess, then people were like, okay, yeah, there's something you need to change about that.

Dr. Wen Shen:

Well, I just want to say on the record that Dr. Kwan here did a wonderful job. I mean, this was really a project that she conceived and carried out, which took a lot of legwork and yes the buy in of a lot of different people, but she did a great job of bringing them all together.

In terms of other lessons that we've learned. I mean, I just want to go back and say the opioid epidemic is multifactorial and it's taking a long time to develop, and it's going to take a long time, I think, to stem the tide of all the different kinds of prescription or nonprescription type painkillers that are out there. But I think there are a lot of opportunities such as this one where you can examine prescribing practices and make a pretty big change with relatively little cost.

I mean, there really wasn't very much except changing kind of prescribing patterns within one single group, but to make such a big reduction to me really made me pause and say, wow. I mean, I think there are probably many, many other situations that are pretty similar where we can continue to make this kind of impact. And I think the future of healthcare, I mean, I think we have a lot of different areas that we're trying to fix and I think there's a lot of money and resources and time being thrown into it. But my gut feeling is that there probably a lot of interventions such as this one that are pretty low cost and pretty reasonably easy to implement once you get some activation energy and a little bit of a buy-in that can make a huge impact such as this.

I think probably targeting those is going to be very, very important going forward as we're trying to reduce costs anyway and we're trying to figure out the best way to marshal our resources. Things like this, where it wasn't adding something, it wasn't really bringing in any kind of high cost or high technology fix. It was really a low tech, low cost thing that can have a big impact. I think that's something that really should be targeted at all levels of medicine and all of us practice. I think that's going to really hopefully continue to make a big changes for the way we practice medicine in surgery.

Tessnim Ahmad:

Questioning the status quo by reexamining the evidence for common practice and educating patients about pain were central to the successful intervention doctors Kwan and Shen describe.

Of course, the opioid epidemic is far reaching and patients undergoing endocrine surgery at UCSF likely don't represent all patients who may be prescribed opiates. For example, those undergoing larger surgeries or patients with other medical and psychosocial comorbidities.

In a future podcast, we'll re-examine opiate use from a social determinants perspective, including social inequities and the opioid epidemic and racial discrimination and pain management. We thank doctors Kwan and Shen for taking the time to speak with us about their research. Dr. Kwan also wishes to thank Dr. Carolyn Seib, who was a clinical instructor in surgery at UCSF during the time they worked on this project. Dr. Seib is now an assistant professor at Stanford Medical Center.

Our understanding of the history of the opioid epidemic comes from an invited commentary published in JAMA in January, 2019 by Dr. Jordan Trecki of the Drug Enforcement Administration. Thanks for listening.