[MUSIC PLAYING]

**JANE LIEBSCHUTZ:** So first of all, it's helpful for me to know who my audience is. How many people here take care of inpatients in the medical setting? So many of you do.

This talk that I'm giving you is a new talk. I've never given it before. And it really comes out of my experience working as a addiction medicine consult on the inpatient service, both in my prior institution in Boston, and then here in Montefiore Presby, because I think that people don't really understand some of the best practices.

There is really not a lot of evidence between what I'm telling you. No one has done trials. And maybe I'll look for money to get trials to do it.

So I actually have real cases that I took care of in the last month, and I'm going to use them as teaching points around it. And again, there are probably different ways to do it. And this is just one way. So let me first just present the cases briefly, and then we'll talk about learning objectives. And then I'll go through the cases, and we'll talk about it.

And if you have objections or other ways you can imagine there may be in treating the patients, then I'm not saying that this is the authoritative. But it's a way of framing and concepting this issue. All right, so wait.

OK, so this is of SS, a 47-year-old female, who presented after accidental a heroin overdose with compartment syndrome because she had an overdose, and she laid on her leg, which caused the compartment syndrome rhabdomyolysis. And she came in to the hospital and immediately had multiple fasciotomies. And I met her in the post-op period. And the consult for our team was to help with pain management and addiction.

The next one is 29-year-old male, JB. He was admitted for a double-valve replacement-- AVR, MVR. He had fungal endocarditis to his native valves that had been diagnosed in April. So I saw him a few weeks ago, so it's six months prior. And he had been treated with oral fluconazole, trying to keep the infections quiescent.

But he had developed worsening cardiovascular function, CHF. And the cardiothoracic surgeons needed to operate. So again, I saw him post-operatively. And I'll talk more about his case when we do it. He had been on buprenorphine. And they wanted me to help with pain management and how to transition him to buprenorphine.

And the third case is LR, 39-year-old male, who was admitted for right shoulder pain. He had blood cultures positive for MSSA. And he had left AMA.

He actually had been admitted to Mercy Hospital. He left AMA because he said his pain was not controlled. And then he presented some hours later-- after he used heroin for his pain-- to Presby ED and was admitted for presumed septic shoulder. And the consult was to help manage him and help with his addiction.

So the learning objectives are, first, to describe a framework for acute pain management in the context of opioid-use disorder, think about best practices for managing acute pain in patients maintained on buprenorphine-- which I think is a conundrum for a lot of folks-- and then learn a novel method to switch from full opioid agonist to buprenorphine. All right, so first I want to just think about addiction. And this is not a new concept, or a new slide, for me. But we have to remember-- and in particular, when thinking about pain control-- we have to think about the brain and how it interacts with addiction.

So really, what is addiction? Addiction is when drugs hijack the normal brain reward circuit. So we all-- when we eat, when we do pleasurable things, we have a surge in dopamine. And essentially, all drugs come down to mimicking and basically having a supernatural surge in dopamine. And then what happens is your brain gets tolerant and then develops withdrawal when you don't have that, because it up-regulates the receptors.

And then it also becomes a learned behavior, or a habit. If you were to get in the car and not plug your seat belt in, you probably would feel uncomfortable, because it's a learned habit. Or brushing your teeth before bed-- it's a learned habit. So drug use is not only a brain reward, but it's also a habit. And so we need to address those issues when we're thinking about treating our patients.

And this slide-- I actually found it on the internet, because I'm not very good at drawing a slide like this. But it illustrates really well the point, which is opioid dependence is a brain adaptation. So when you first start using, you develop euphoria. That is the first experience when one uses drugs.

And then as you use it, and your brain adapts, you no longer experience that same euphoria. You really experience, maybe, pain relief. And over time, you begin to use just to feel normal, because when you're not using-- when the medicine, or the opioid's, not in your system-- you get dysphoria, you get hyperalgesia.

So this is a really, really, really important point. If you don't remember anything else, remember this-- that if somebody does not have opioid onboard, and there's somebody who is tolerant and used to using opioids daily, they will develop pain as, potentially, a first sign of withdrawal. So pain and withdrawal are closely linked together. Now I'm going to just review what are the classic symptoms of opioid-use disorder.

So one is-- and this isn't the full *DSM* criteria, but these are the main things to remember. So it's a strong desire to use, craving to use; inability to control use or to reduce use, despite wanting to; continuing to use, despite knowing the harm that comes to you; having tolerance, or needing to use a larger amount over time-- and again, this is a really important point when we think about our patients who have opioid-use disorder who are needing pain relief; spending a good deal of time to obtain and use opioids; thinking about it, focusing on it-- it's full force; and then withdrawal symptoms, which include pain as an early hallmark of withdrawal.

Just remember that the vulnerability of substance use can also impact the experience of pain. So pain is a subjective feeling. There are objectives-- firing of pain fibers. But people feel the same firing of the same nerve fibers very, very differently. And I'm sure you guys all know, in your practice, patients who come in who have horrible disease who basically take Tylenol, and they're fine, and other people who have really what we think of minimal disease-- that we can find on an X-ray, organic-- and are disabled by it.

So really, the experience of pain is informed by a number of things, including pain threshold. So individuals with opioid-use disorder have a lower pain threshold. So less amount of stimuli can increase their pain.

Social stress can increase the experience of pain. Depression and anxiety-- which is often comorbid with addiction. Financial strain-- anybody who has got active addiction, there's some financial issues. And then decreased coping skills-- so if you use drugs to cope, when you are now in a setting in the hospital or have acute pain, it's very hard to cope with. You don't have those built in other kind of coping skills.

And then one other thing-- that pain can impact recovery of some substance-use disorder. This is more of an outpatient thing, but there's a lot of evidence that untreated pain can feed into people who have an addiction and decrease their ability to get off drugs. So pain can cause distress, which may cause craving, use, withdrawal, and pain. It's a negative cycle. So pain is quite important for us to address in folks with active addiction or in recovery from addiction.

All right, so this is my attempt to really think about the priorities of what we need to do when we treat patients. And the four foundations here, really, are equally important. First and foremost is humane care. And I talk about it on the next slide in a minute.

But then standard medical treatment-- we can't treat people worse than we would just because they have a drug addiction. We need to work to remember to prevent withdrawal. Even if they're not engaged or interested in substance-use treatment, we need to make sure while they're in the hospital, while they're under our care, to focus on treatments that will alleviate symptoms of withdrawal.

And then, of course, alleviate acute pain-- those are really foundational pieces. And then on top of it, a bonus is to really address their substance use. And if you happen to be in Presby Montefiore, right now, we have an addiction consult service. We're hoping to expand it to other UPMC hospitals. If we can address it, fantastic. That's really great.

MOUD stands for Medications for Opioid-Use Disorder. You may hear MAD, Medication-Assisted Treatment. Medication is the treatment, so it's not assisting another treatment, so we've changed the lingo to MOUD. That's the current way of thinking about it.

And then, if you can link to treatment-- start them on treatment, link them to treatment-- that is the cat's meow. And that's what we tried to do on our addiction consult service. But if you're not an addiction specialist, you really need to make sure you focus on the bottom four, at a very minimum.

So humane care-- what do I mean by humane care? Humane care is avoiding stigma that goes along with opioid-use disorder. And there's a lot of evidence that, when there is stigmatizing language, when there is stigmatizing verbiage and attitudes towards patients, it both basically erodes the confidence that addiction is a valid and treatable health condition.

And there is evidence when-- there was a study where a number of individuals who were substance-use specialists received theoretical stories about patients, or clinical scenarios. And when they substituted stigmatizing language-- and there was multiple choice about which treatments, and it was a randomized trial-- they found that stigmatizing language decreased use of evidence-based treatment. So we know language really, really matters.

And so one kind of language I would like to see everybody try to remember is person language. So we used to say-- HIV is a really good analogy. So now we say, PW, Person With-- Person Who lives with HIV, or Person Who does this. It really changes the way you think about somebody.

Instead of say, injection drug abuser-- that has one connotation. If you say, person who injects drugs, person who uses drugs, it really has a different flavor to it, and it puts the person first. So PWID-- Person Who Injects Drugs. PWUD-- Person Who Uses Drugs. That's the kind of language that's useful to document.

So back to our case-- I mentioned she presented after an accidental heroin overdose with compartment syndrome rhabdomyolysis, fasciotomies. Her past medical history included depression, hepatitis C, which had been successfully treated. She had a history of heroin use. And she had a long period of time where she was sober and not using drugs.

Her daughter died of an overdose a couple of years earlier. And around the anniversary of her daughter's death, she returned to using drugs. And this was in that setting. She also has a history of crack cocaine use, which is more intermittent, and injected drugs. So that's her substance-use history.

The clinical question was, as I mentioned, how to treat her pain and her substance-use disorder. She had multiple surgeries. Probably every other day, every third day, she was getting surgery. She was initially in the ICU. She was transferred out.

What was interesting-- even a few weeks-- she's still in the hospital. She's been in the hospital probably five weeks. I first met her at the end of August, so five, six weeks. And what was really interesting is, when her pain began to be controlled, the days that she had the surgeries-- she went in for multiple procedures-- she would be in agony the post-operative day.

So let's review what pain meds she was being treated with. So she was on a PCA pump. And she had no basal dose. She was given hydromorphone, a 1-milligram bolus possibility every four times an hour. So that's 4 milligrams an hour, for 12 hours. And she used it every hour.

Every hour she was-- there was never an hour of the day where she wasn't using the full 4 milligrams that hour. So that's 48 milligrams of hydromorphone a day. And then she was also written for the nurses to give her 3 milligrams IV push every six hours. So that's an additional 12 milligrams a day. That's a lot of hydromorphone.

So I have a question for you, and we're going to review each of the answers. These are learning points. But I'm going to do a show of hands. So what option would you choose next for her treatment?

So one, would you start methadone for both her opioid withdrawal and pain? Two, would you give buprenorphine for both her opioid withdrawal and pain? Would you start to taper her medications, because she's on a huge dose, so she won't be on so dependent at discharge? And would you add a basal dose of hydromorphone to the PCA?

So I'm going to just go through those. And I just want a show of hands. And just put your best guess out. How many people think one, methadone? OK, at least a few. A few sprinklings of answers.

How about buprenorphine? A few more. How about tapering the medications so she won't be dependent? A few more there. And what about a basal dose of hydromorphone? So a number of you.

All right, so let's talk about each of these options, which would be-- well, I don't know if they're reasonable options. But they're options that physicians might do. And you could see why they would do them all.

All right, so methadone-- we all know that methadone is a full opioid agonist. It works at the mu-opioid receptor. It actually also works in the NMDA receptor.

So it has some additional properties, which are useful for other kinds of pain. It acts both in the CNS and peripherally in smooth muscle. And it comes orally. And then, if you have a patient who is NPO in the hospital, it can be given in injectable form.

And you have the dose. And you can give it BID. And if you don't know how to dose it, ask your pharmacist to help you. But just remember, patients can get it. If they're on it as an outpatient, and they're coming in, and they're ICU, and they're not taking oral medication for whatever reason, you can't give it IV-- I mean, IM.

It has a long and variable half life for sedation and withdrawal, which makes it a fantastic medication to treat opioid-use disorder. It can be given once a day. It covers the receptor saturation, so people don't experience withdrawal.

If you are opioid naive-- if I was given it, it could last days in me. Somebody who is regularly using heroin or fentanyl, the half life is about 24 hours. So it really has a long half life.

The problem with methadone is that its analgesic properties are really only 48 hours. So it's not a great medication given once a day to treat 24-hour pain. So that's a limitation in this particular case.

One other point about it is that QT prolongation-- so in patients who are maintained on high doses of methadone, a certain percentage, anywhere from 2% to 16%, will get QT prolongation attributable to the methadone. The mortality rate for cardiac arrhythmias attributable to methadone is vanishingly rare. It's in the 0.06 per 100 patient years, so vanishingly rare. It's when people have multiple QT prolongation medications that it is important.

All right, the other issue is long-term methadone is only given in federally-licensed programs. And it requires daily dosing, showing up daily. And there are a lot of barriers, including transplantation, time, and stigma.

And so unless somebody actually is interested in long-term methadone treatment, I tend not to start it in the hospital, because now you're obligating. You're giving somebody something that takes a long time with to withdrawal. And I'll talk a little bit about withdrawal in a moment. But it's not something I would start.

And so in this patient, unless she was interested in methadone, I probably wouldn't start it as a pain mechanism. But it's not unreasonable to think about giving her some methadone. That may be helpful for some of those withdrawal moments that she may have.

So buprenorphine is a partial agonist that also works at the mu-opioid receptor. And one of the key features of buprenorphine is that it binds very tightly to the mu receptor much higher than any full opioid agonist. And because it's a partial agonist, if somebody is opioid tolerant, and they have opioid on board, and you give them buprenorphine, it can precipitate withdrawal. So you would never give somebody buprenorphine who is on these gigantic doses of hydromorphone.

I'm going to talk about the next case-- how to switch somebody to buprenorphine who's on agonist. So wait for that. But this patient would not be appropriate for buprenorphine in this current state. It has a long half life, and it's in multiple forms.

So just one other thing about office-based buprenorphine-- it's the first medication for opioid-use disorder approved for office-based treatment. And the Drug Addiction Act of 2000 was passed and required eight hours of training to certify people for being wavered. PA, MPs need 24 hours.

How many people in the room have a waiver to prescribe buprenorphine? Yea, all right, I hope next year more of you will raise your hands for it. It's really easy, important, for internists to get this waiver.

And then I mentioned about the severity of withdrawal. So heroin withdrawal has a peak in the first few days-- very high, very severe, but then it's over. Buprenorphine has less of a peak, lasts a little bit longer, maybe a week. And then methadone can last for weeks, and it's really annoying withdrawal and very difficult for patients who don't want to be withdrawing from methadone.

Most of you, the vast majority in the room, do not have a buprenorphine waiver. But don't worry. You can prescribe methadone or buprenorphine when a patient is hospitalized for a medical or surgical reason in order to manage their medical problems.

So this is the actual rules from the government. So if opioid-use disorder is complicating inpatient medical treatment, there's no need for a special waiver to prescribe. And our recommendation is patients on the inpatient service get 20 to 40 milligrams of methadone a day-- you don't want to start off with a high dose, you start off a low dose-- to treat their opioid withdrawal and opioid symptoms. And buprenorphine-- anywhere from 2 to 16 milligrams a day. And remember, they need to be in withdrawal, or opioid free, in order to get it. Otherwise, you'll precipitate withdrawal.

So we reviewed the options-- methadone, buprenorphine, taper her medication so she won't be dependent on discharge. So I actually would not be in favor of this third one. Part of that is that you need to be humane.

She's here. She's not about to walk out the door right now. She's needing more surgeries. And so tapering her, somehow thinking you're helping her, is only going to cause her more pain. Unless she's committed to staying away from using drugs, tapering her is really just going to complicate your and her experience in the hospital.

And then the last one is adding basal-dose morphine. So this is actually what we chose to do. There's other options that you can do as well, which is giving oral long-acting agent.

But let's talk about why that is. Now, her case is a little bit different. She's on gigantic doses of hydromorphone, and she's getting them around the clock. But in another patient-- and many patients I see are getting PRN oxycodone or other short-acting acting meds, no basal, no long-acting.

And this is that other graph we talked about before. This is a graph I have where you want to keep people in this comfort zone. And when the opioids wear off, they develop pain. So many of us see patients that say, I feel good for the first couple hours, and then the pain comes on. And you think, oh, well, I'll give you a higher dose.

But a higher dose isn't going to help, because it's still going to wear off, unless you increase the frequency of the dose. So this is why I like to give a long-acting oral agent. I'll talk about that in a second.

All right, so one of the things to think about is how much opioids you're giving. And you want to convert to a morphine-equivalent dose, which would be what we call MME. And you don't want-- and if you ever hear me talk about this, I say this. I repeat this, which is, how are these calculated?

These MMEs were calculated by taking college students, or normal controls, sticking their hand in a bucket of ice water, counting how long they could tolerate the discomfort, and pulling it out. That's their baseline. They'd give them a dose of morphine. They'd repeat the same test, have a wash out, repeat the same test with hydromorphone, have a wash out. So this is how these morphine-equivalent doses were tested.

They weren't on our patients who are opioid tolerant. They weren't on patients with an opioid-use disorder. They weren't on our chronic-pain patients. So you always have to take these with a grain of salt.

And we also know there's a lot of genetic variability in the mu-opioid receptors. So some people respond to codeine, some people don't. So you really don't 100% know how somebody is going to respond.

But that being said, the calculator is useful for getting a ballpark equivalent dose so you have a sense, because you may not know. Hydromorphone 60 milligrams may not sound a lot. But when you actually do the calculation, it's 1,200 milligrams of morphine a day, which we all know is a huge amount. So this is what she was getting in the hospital with her PRN doses.

So this is what we did. We gave her a basal hydromorphone dose of 0.5 milligrams, so that's 12 milligrams a day. And then we allowed a 0.5 milligrams every 20 minutes, which translates to 36 milligrams a day. So that, together, is 48. And then we gave her long-acting morphine, 15 milligrams, twice a day. So overall, it's probably about the same as what she's getting, or maybe a little bit less.

And we stopped the IV push. If somebody is on a PCA pump, there is zero reason for them to ever get an IV push medication. I mean, maybe in the 12-hour post op or something, in the PACU. But that's different.

And then the other thing we really did was motivational interviewing for getting into treatment, which she was still ambivalent about, despite having this life-threatening problem, almost losing her leg. So she markedly improved at that point. And this, now, was our new starting point for tapering. And that's, essentially, what's been going on in the hospitalizations since. She's been slowly getting tapered down.

But once you get the pain in control, that's where you start. That's where you go. And you get that morphine on board, which is just in their system and does a very nice job for pain control. We don't use it quite enough.

So the next patient was admitted for the valve repair. And his past substance-use history was he had a history of heroin. And he actually stopped seven years ago, and was treated successfully with buprenorphine, and really did a great job, and said, OK, I'm ready for the buprenorphine to be tapered. I have a life, relationships, and job, and everything.

Well, last December, he worked with his provider and tapered off the buprenorphine. And he was off it for a few months, and he returned to drug use. And within the first few weeks of his returning to drug use, he developed endocarditis, and then was treated, and then developed this fungal endocarditis. But he was quickly stabilized again on the buprenorphine-- the Suboxone-- and was stable on that prior to his hospitalization.

I'm going to review a few different options-- none of these are evidence-based-- for use of buprenorphine, how you manage elective surgery, or surgery, with a patient on buprenorphine. And these are all been written about in the literature in centers of excellence. And both anesthesia and addiction medicine-- all successfully using these different methods.

So method one-- which is my preferred method, because I've used it, and I've seen it successful-- is actually just continue the buprenorphine throughout the perioperative period and adding, ideally, non-opioid pain treatments. And then you can always do an IV opioid as needed, because the advantage of this-- and also the next one, which I'm going to talk about-- is that a patient's already on it. And there's less likelihood of relapse to drug use, trying to manage patients on full opioid agonists and switch over. Although I may change my mind sooner, because I'm going to tell you about a new method to switch to buprenorphine.

All right, so this patient-- option number two is also very reasonable, which is continue buprenorphine up until the day of surgery, and just hold it the morning of surgery. And then give a long-acting basal dose before the surgery, like 15 milligrams BID. Use a PCA for breakthrough pain. And then transition to buprenorphine post discharge under the care of the buprenorphine prescriber.

Another option-- which University of Michigan, Department of Anesthesia has written about-- is to actually stop the buprenorphine five days before the surgery. And give them a long-acting extended-release opioid, give them a PCA for breakthrough perioperatively, or PRN transition of buprenorphine. My issue with this one is you've got that period on full agonists out of the hospital. And there's a risk of return to relapse, particularly somebody who is not really stable in their substance-use treatment.

OK, so our patient was getting 3 milligrams of IV every four hours and was in significant pain, same hydromorphone. So what are the pharmadynamics of hydromorphone? So its onset is very quick-- five minutes. It peaks at 10 to 20 minutes. And its half life is about three hours. Anywhere from two and a half to four hours is what I was able to find in the literature.

So what's happening to this patient? He is getting some relief. But it's just wearing off too soon, because he's getting dosed every four hours. And he's going into withdrawal between three and four hours.

So this is what we did. I put him on long-acting morphine, 15 BID-- prevent withdrawal, and give some basal pain relief. We started a standing oral oxycodone dose, rather than waiting for a nurse to do a IV push. That puts strain on both. So just having a scheduled, standing, pain relief-- this guy had double valves, major surgery. He's going to need pain for a few days.

So you do this. You don't keep it on forever. You do it the first 48 hours. And then, if he had very severe pain, you can do the IV push, lower dose. But really have a time limit-- it may be a 48-hour-- for that initial post-op period.

In terms of non-opiod pain relievers, there's been a few different trials of-- and I'm sorry if this is a little-- well, maybe you can probably see that. So there's really acetaminophen, non-steroidals, and COX-2 inhibitors. This was a meta-analysis of randomized trials-- many, many trials-- of different adjunct non-opioid pain relievers and their impact on a 24-hour morphine consumption.

And so you can see here that-- and this is the meta-analysis. And all of these box plot are showing advantages to decrease morphine dose. And the estimate is over here on the right.

So anywhere from a single dose of a COX-2 inhibitor, decreasing morphine by 7 milligrams in a 24-hour period, up to another single dose, 27 milligrams. So non-steroidals, acetaminophen, COX-2 inhibitors, can all be beneficial in the post-op period for decreasing morphine. No reason we can't use them in these patients for pain.

And then ketamine is also-- now, this is off-label use for pain, so I want to make sure you know that. And this was a meta-analysis looking at the impact of pain. And again, you don't have to see the details. But you can see the total overall was decreased pain, compared to placebo.

And then the other one is-- this is the weighted mean use in morphine and, again, decreased morphine dose with ketamine. So ketamine is a decent option. Again, these are really sick patients in the hospital we're talking about.

Gabapentinoids-- a lot of people put them on. There's really limited evidence showing benefit. They can be sedating. And these are potential drugs of abuse with high street value-- not high street, probably, but some street value. Do not start long term treatment with gabapentin in the hospital, please, for acute pain.

So now this is-- we have six minutes, and I'm getting close to the end. And this is a really important slide that you can refer to later on. So how do we get patients from full agonist opioids for pain to buprenorphine?

And traditionally, it was felt that they-- the patients, you had to stop them. They had to go into withdrawal before you do it. And it really makes it difficult to start a patient on medication if you're forcing them to go in withdrawal.

And so this was published initially by some colleagues at UCSF. And we have started to use this with great, great success, even on patients on decently-high doses of morphine. So what you do-- at initiation, you take them off the long-acting now, the morphine. You stop the MS Contin. And you just put them on a short-acting.

So you could stop the MS Contin this morning, and then start this tomorrow morning. It's not like you have to stop it for days. Or you can even give it last night, and start this process tomorrow. So day one, you would add a Butrans patch.

Now, Butrans is FDA approved for chronic pain. It's buprenorphine in a transdermal delivery once a week. It is magnitudes lower in strength than the sublingual buprenorphine that we prescribe for opioid-use disorder.

And remember what I told you earlier about the affinity of buprenorphine to the me-opioid receptors? It's 16 times more, it has more affinity than full opioid agonists. So the advantage of the Butrans patch is that it's quite low. And so you can start to occupy some of the brain receptors, but you're not going to bump off all the full agonist. So it's a nice way to get buprenorphine on board without having to stop the full agonist.

So if a patient's on 80 MMEs a day or more, you would give the 20 microgram Butrans patch, day one. If they're on lower amounts-- 10 microgram patch. Day two, you start a low dose-- 1 milligram of buprenorphine, sublingually-- and you observe for a couple of hours. If they're having pain or withdrawal, you continue and give more every two hours up to 8 milligrams the first day, and you take off the patch. And it's a week-long patch, so you're not using six days of it.

But we've been doing this. Day three, you administer whatever buprenorphine dose you administered on day two, and you can titrate up to 16 milligrams. And then, day four, you administer whatever you gave on day three, and you can titrate up to 24 milligrams-- that's higher than we generally give but, in this setting, you can do that-- and continue split-dosing. And then, on day five, you got your established buprenorphine dose. And you can discontinue, now, the oral full opioid agonist.

And we have been doing this in the hospital. Sometimes we do this a day or two before discharge, so we don't end up getting to day three, four, and five. But it is a fantastic way to get patients to buprenorphine.

Now, I'm not expecting all of you are going to do this. But if you treat patients at Presby, make sure that addictior consult is helping with that. And if you want a consult, you have my email. You can email me and say, I want to do this patient. I will call you and talk you through how to do it on your patients. But it's really good.

All right, so in the next two minutes, we have our last patient. This was somebody who had the shoulder pain. He had left the outside hospital. And this is a behavior problem for a patient, right?

His history was he'd been continually using heroin for a very long time. But he did have periods of sobriety without any medications. And he was going to 12-step programs during that time. And he really did well when he was on Vivitrol, or extended-release naltrexone.

So when we consulted him, he had behavioral issues. He was leaving AMA. He was in pain. He was not very pleasant, and difficult for the nurses, and the doctors. But he was interested in naltrexone treatment.

So what our plan was-- really, to build trust, because when patients are acting out, really it's a lack of trust. And so instead of being more stringent and putting rules and stuff, actually trying to ally with the patient and develop a relationship with them is more useful than giving restrictions and rules. I'm not saying you can't do restriction and rules. But really sitting and building that alliance is important.

And we started a standing pain regimen, including long-acting medicine, as I talked before, because he was going to be in the hospital for a while. He had a septic shoulder. It wasn't like we're doing him a favor by taking him off opioids. All right-- one minute.

So conversion and naltrexone is really difficult. You need to be off of opioids for a week. And this is a trial that compared buprenorphine to extended-release naltrexone. And the key difference here was the rate of induction onto the medication.

So buprenorphine-- which, in and of itself, needs withdrawal-- 94% were able to get it as randomized. But only 72% of patients randomized to extended-released naltrexone. So it's just harder to get people on. And you have to walk them through it. But it's not an unreasonable way of thinking about it.

This is the last slide I have, which is really supportive care to patients, making an alliance with them, and really following residential or close follow-up. Particularly a patient like this-- he might need residential to really detox off the opioids in order to be put on naltrexone.

So just reviewing the last slide, what was my learning objectives? We talked about a framework for acute pain management in the context of opioid-use disorder. We talked about managing acute pain in patients maintained on buprenorphine. And then we talked about this novel method to switch from full opioid agonist to buprenorphine.

I am more than happy to respond to people if you have questions or need outside consultation about a difficult inpatient on these issues. So thank you very much.

[APPLAUSE]