

Advancements in Pain Management

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Dr. Ransohoff: Hello. I'm Dr. Kurt Ransohoff, the CEO and chief medical officer here at Sansum Clinic. I'd like to welcome you to "Sansum Speaks," a speaker series presented by the Sansum Clinic Women's Council, but by Julie Nadel and Bobbie Rosenblatt. The series demonstrates our commitment to providing not only the highest quality healthcare but also informing and educating our community on important healthcare topics. These talks will be filled with valuable information presented by some of our most distinguished healthcare providers. The more you know, the more you will get out of your healthcare experience at Sansum Clinic. So, again, thanks for joining us.

This presentation is called Advancements in Pain Management. And I'm pleased to introduce our pain management specialists, Dr. Graham Reimer and Dr. Emanuel Zusmer. Dr. Reimer earned his medical degree from the University of California at Davis and then completed both his internship and residency at Dartmouth-Hitchcock Medical Center specializing in anesthesia and pain. He also completed a clinical fellowship in interventional pain management at Mayo Clinic. Dr. Zusmer earned his medical degree from the University of Miami School of Medicine and completed anesthesia residency at the University of California in San Francisco. He worked with the Anesthesia Associates Medical Group here in Santa Barbara for five years before transitioning to pain management. Dr. Zusmer completed his pain management fellowship at Oregon Health Sciences University in Portland. First, we will be hearing from Dr. Reimer.

Dr. Reimer: Thank you, Dr. Ransohoff, for the introduction. And as Dr. Ransohoff said, I'm Dr. Reimer, and my partner, Dr. Zusmer, who you'll be hearing from momentarily. I'm gonna talk a little bit about pain management, give an update on what that entails in the modern era, talk a little bit about general pain principles, and talk a little bit about the procedures that are up and coming, new and bread and butter that we use in pain management on a regular basis. I think a lot of people when they hear the words pain management, they think about opiates, they think about giving pain pills to people. And while that is still a small portion of what we do, we found over the years that our practice

has changed such that we try to target very specific pain issues and address them specifically with newer technologies to reduce pain.

As most people know from reading even peripheral glances at the news, there's a large problem with opiates in the country, a lot of that elicit, but also prescription. And so our job as physicians is to try to find ways to help people with pain while trying to minimize or eliminate the need for opiates, which are still a tool that are used today, but have become perhaps a last resort in treating various types of pain conditions. So, a lot of what our practice entails is figuring out a patient's pain, what could be the source of their pain, what alternative strategies could be used, and trying to target those things early on in the process. So, what we do in the pain management clinic is a lot of evaluation. In a kind of a standard office setting, we try to figure out by looking at our patients, by looking at their imaging studies like an MRI or a CAT scan, by examining them, looking at the physical exam findings that could give us a clue as to whether pain is coming from a certain source or another source and try to figure out the origin of that pain so that we can more efficiently and effectively treat that particular pain condition.

A large focus of what we do is trying to interrupt pain early on. As many of you may know, the early start of pain often happens from an acute event. And we talk about acute pain being the first pain that people experience from an injury or an illness. It could be something like a trauma, something like a fracture, sometimes a surgery, sometimes an illness like a viral illness, and some people develop pain thereafter. What we are oftentimes trying to figure out is, what's the origin of the pain? What can we do to figure out next steps in terms of how long is this gonna last? How do we need to treat this? Do we need to treat it aggressively or treat it conservatively? And so a lot of pain treatment involves very tailored approaches to each patient to figure out what the best course of action is.

There's a whole host of different types of pain management, and tonight we'll talk a little bit about the kind of bread-and-butter commonplace treatment for pain, especially spine-related pain. And so we'll kind of highlight a lot of spine-related issues because that is a major portion of what people see a doctor for. One of the most common complaints that people come to the doctor about is pain in the back. And so we'll talk a little bit about the various types of back pain, sciatica pain in very basic principles, and then get into a little bit of what the treatment options are, both commonplace and more advanced options that are helpful for patients who are suffering from pain issues, acute, subacute, or chronic.

We talk about treating pain early. And what that generally means is targeting pain as soon as we realize that it's gonna be lasting longer than we initially expect. And in kind of a general sense, if someone stubs their toe, there's pain for a few minutes, maybe an hour, but the pain generally gets better on its own as the body adapts to that pain. The body sees it as a problem, it alerts the person to the pain in the toe, and the person maybe stays off the foot for an hour and tries to rest the leg. But as pain gets longer-lasting, perhaps from an injury, from a chronic illness, the pain can transition into what we call a non-useful pain, meaning a pain that no longer indicates there's an injury and we need to guard against further injury, but in fact that the pain persists despite the injury or that illness being healed. And we call that chronic pain. And so, in general, our general definition these days is that chronic pain is about six months of pain that it persists outside of the normal healing period.

So, if someone has a surgery, we expect there may be some pain associated with the surgery. There's an incision, there's some operation done. There's gonna be pain associated with that. We expect that. If, however, that pain lasts longer than a certain duration, where we say, you know, the surgeon expects this to get better within two to three weeks, but now we're talking three to four months down the road, perhaps there's something else going on that the surgery site healed, the surgeon says, "Everything looks fine. No infection. Everything went perfectly with the surgery." But perhaps now there's persistent pain. The general principle there is we wanna catch these issues in the short span between when the pain is thought to be self-resolving, meaning it's gonna get better on its own, and when it's gonna be transitioning into a more chronic pain in about six months in general. And the purpose of that is that the pain outside of that six-month general window can be harder to treat because what happens over time is people adapt their central nervous system, meaning their nerve roots, their spinal cord, their brain thalamus, other parts of the central nervous system can adapt to chronic pain and start to come up with pain issues that are not helpful, meaning they cause persistent pain, persistent nerve pain that can persist outside of the period when we expect healing to occur even though the initial insult is now gone.

And so we're trying to interrupt that cycle to interrupt pain that is lasting longer than it should before it becomes a chronic pain issue, which can be much harder to treat and much more troublesome to patients. A lot of this also has to do with the fact that we're trying to interrupt the cycle of patients going from treating with kind of standard short-term medications for a surgery or a short-term illness or an acute injury and transition into being on some more dangerous

drugs, things like opiates, which can have trouble with addiction and other serious side effects. And so we're trying to interrupt that to make sure that people get better before they need to be on a longer-term treatment such as opiates or other more dangerous medications.

So, I'm gonna stop and kind of transition to a slightly different topic with the idea that we're gonna focus now on back pain as a for instance. So, we're gonna talk a little bit about back pain, what the various types of back pain are, and then what the commonplace treatments for back pain include. The back has a lot of different potential sources of pain, meaning there can be a lot of different places in the spine and outside of the spine that can cause back pain. And we're gonna talk about some of the most common things tonight, but certainly not all. Back pain, in general, is divided into two main categories, what we call axial, meaning in the standard low back, generally, in the region, for instance, for the low back, right around the belt line, maybe in the lumbar spine, the low back region. That's what we call axial pain.

The second kind of pain that in general terms we talk about is called radicular pain. And that's what many people know as sciatica. And that involves pain that radiates from one location to another. So, for instance, in the low back, that can be pain that radiates from the low back down into the limb in the lower extremity, meaning the leg going down the buttock, down the hip, down into the leg or foot. And people typically associate that with sciatica. Sciatica is a general term that includes some of these types of pain issues we're talking about today, although there's some nuance to that. The general principles...and I'll show on my spine model what this entails, and I'll bring this up to show a few general principles here.

So, in the spine...we look at the spine as the kind of three columns. The first column is the front column, we call that the anterior column of the spine. And the front column of the spine faces forward to where the guts are, basically, so, where your stomach and other things are. Just before the spine, you see those kinds of general abdominal structures. And that's called the anterior column made up of the vertebrae and the discs in front. In the back, you have several different components, and this is called the posterior column, meaning the bony part of the spine that faces backward. In this part of the spine, you see these various bones that stick out, and these are called the spinous processes. And these are the bones that you can generally feel in your back as you touch down the midline of the spine. Those are called the spinous processes. And these bones here are all connected to each level by a series of bones that interweave and are connected by joints. I'm gonna point out a few important structures

back here that we'll come back to when we talk about treatment. The several structures include the spinous process, which you see way in the back. The other important structures you see in the back portion include this joint here, which is called a facet joint. And that's where these two bones, each segment, one vertebral segment meets the next one down. There's a groove or gap through there called a facet joint, like facet, but pronounced facet. And this is a joint that commonly gets arthritis and can cause back pain.

Now I'm gonna bring us back to the three columns of the spine, the anterior column in the front, the posterior column in the back. And in between those two columns of the spine is where the nerve structures live. And as we bring this forward, you can see in the middle between the anterior and posterior columns of the spine, you have this central canal, and this is the main spinal canal through here. This blue piece here represents the spinal cord, which sits in the main part of the spinal canal. What you see on the sides are these structures which are also in blue, which are branches of the spinal cord. And these are called the nerve roots. And these are the branches of the spinal cord that can travel down into the buttock or a leg and often involved in what we often hear as sciatica, but what we call in medical terms radicular pain or radiculopathy. So, those are the three columns of spine, anterior, front, posterior, back, and then the main spinal canal through the middle with the nerve roots coming down into the buttock and leg.

Now, when we talk about these types of pain issues, we talk about axial pain issues. Axial pain issues are the pain issues that are generally felt or perceived by a person or a patient in that low back area if we're talking about the low back specifically. And these principles can also apply to the cervical spine, the neck, the middle back, the thoracic spine, or into the pelvic region to some degree. But I'll focus on the low back as a means of example. So, in talking about the low back, the axial spine structures that are oftentimes involved in causing back pain include the discs if they have wear and tear or a tear in them, the vertebrae, oftentimes involved in edema, meaning inflammation of the vertebrae, or even fractures where the bone can fracture, called a vertebral compression fracture. The other structures, as I pointed out earlier, that can cause pain in the back are the facet joints, which are the joints that can get arthritis in them. Below this...and you won't see this on this particular model, but just so you know that it exists, just below the lumbar spine, there's a structure called the sacrum, and that has some joints in it called the sacroiliac joints that can also be a common cause of what we call axial or standard back pain.

Backing up a little bit, again, talking now about non-axial back pain, but in fact radicular pain, pain that radiates from the back down the leg. The corollary there, meaning the other portion where we see this, is in the neck or in the ribcage. In the neck, that can cause pain that radiates down into the arm if there's a pinched nerve. People can get pain that wraps around the ribcage if they get pain in the middle back or thoracic spine. In the low back, for instance, people can have a few things that can cause pain that runs down the leg. One is, if there's a pinched nerve, and that's the common term for a compressed nerve or a compressed nerve root, meaning a disc herniation or other structure can compress a nerve. Other things can cause nerve impingement as well. So, as time goes on, as people get older, especially they can get more arthritis or other degenerative phenomena where something wears out, it can cause more narrowing, creeping in and narrowing the diameter where the nerve emerges from the spine. And that can cause radicular pain, meaning radiating pain down the leg, which mimics sciatica.

The other common things that we see is referred pain. So, pain can come from other places in the spine, including the joints, which can also cause back pain, but perhaps sometimes send referred pain, pain radiating somewhere else even without a pinched nerve. And so the example I like to give when I'm talking about referred pain is oftentimes people know the example of a person having a heart attack. They'll have a heart attack where they'll feel it in their chest, but they also may feel it in their ear or down the arm where they have pain. Even though the heart is the source of the pain, some patients will perceive pain in other places because there's some crosstalk between the nerves that go to the heart and that go to the arm, for instance. The same thing can happen with the back. So, if there is a problem with the joint that's arthritic, it can also send pain not only in the back, but sometimes some pain that radiates down the leg, even in the absence of a pinched nerve or a nerve compression. So, those are the two main categories. There's axial back pain, which is commonly seen in lumbar structures. You also have radicular pain, kind of a pinched nerve or compression phenomenon, and that is commonly seen with sciatica, now, what we call in medicine radiculopathy or radiculitis in most cases.

So, what can be done about these basic types of back pain? And so it involves a lot of workup. And a lot of these things that I'm gonna talk about require some preliminary work on the part of primary care physicians, urgent care doctors, emergency room doctors, and pain physicians to look into these issues to see where are we expecting to find a painful issue. And again, that involves getting imaging studies, whether that's X-rays, CAT scans, MRIs. It can also involve a

physical exam, meaning examining a patient, seeing where the pain is, what's tender, what the neurologic exam is, checking reflexes, checking for sensory function, motor function of the limbs. So, checking a lot of things to see what gives us a good clue as to where the pain is coming from. And then, of course, looking at the imaging to see, is there something that corresponds. A lot of people will have a herniation of a disc in their back, but it may not be the source of the pain. So, we have to really tailor what we're determining to be the painful issue with the patient's symptoms and with their MRI or CAT scan findings oftentimes.

So, a couple of things that we talk about in terms of treatment options for commonplace painful issues. Number one is folks who have radicular pain, that sciatica, or radiating pain. If there's a pinched nerve, meaning a nerve compression either from a disc herniation or overgrowth of bone that compresses a nerve, one of our mainstays of treatment, besides things like physical therapy and medicines, is doing something called an epidural steroid injection. And that is a very common procedure that we use. It's commonly known, meaning people in public have heard about this quite a bit because it's a common procedure that we perform. And the main purpose of an epidural steroid injection is to reduce inflammation, thus reducing pain around a nerve that may be irritated from a disc herniation or other compression of the nerve. And there are a couple ways to do this, which I'll highlight the basics.

The principle we use is to come down into the spine under X-ray, generally, and put medicine into the area where the nerve is impinged. And so that involves bringing a needle under X-ray guidance, usually in an office or a surgery center setting, bringing a needle...I'm gonna use my pen as the example of the needle. Bringing a needle down into the back part of the spinal canal so that it spreads into the spinal column to help bathe those areas where the nerve is impinged upon by a disc herniation or other sources of pain to reduce pain through there by putting anti-inflammatory-type steroids in.

The other approach, instead of putting it down the main spinal canal, which is called an interlaminar epidural, the other commonplace way we do this is called a transforaminal epidural, and that is to put medicine through the side part of the spine right where the nerves is impinged upon or pinched. And that is called a transforaminal epidural. Both those techniques are done under fluoroscopy, meaning X-ray guidance, done by generally a pain physician who is very experienced in putting medicines under X-ray into very specific locations safely. Those are the two main types of epidural injections.

The common questions we're asked about epidurals are, is that gonna fix a problem, meaning, is it gonna dissolve a disc? And the answer is no. It doesn't dissolve a disc, it doesn't dissolve a structure that's narrowed, but it does reduce inflammation, thereby reducing the pressure in terms of inflammatory pressure on the nerve and it allows the body to adapt and people to have a more...an easier recovery if there is a disc herniation, for instance. Many times the body is very good about healing itself and so these painful issues like a disc herniation, for instance, can be absorbed by the body over time. And so we oftentimes are helping people to participate more meaningfully in physical therapy and other types of exercise to recuperate from an injury while we let the body do its healing process. So, epidural injections are generally used for radicular pain, meaning that radiating pain down a limb. So people who have a pinched nerve, sciatica sensation, oftentimes will benefit from an epidural steroid injection. That's one specific type of treatment that we do.

The other commonplace treatment that we do is something called radiofrequency ablation. And that is generally...at least in terms of talking about low back pain issues, although it can be used in other locations throughout the body including the knee, the hip, shoulders, neck, we're gonna be talking a little bit about back pain treatment with this radiofrequency device. And so what is radiofrequency and how does it help us in terms of back pain? Radiofrequency ablation is a type of ablative procedure that allows us to, without steroids, zap away a small pain sensor that goes to a structure that is painful. And the example we'll use, again, coming to the model, is something called facet arthritis or facet arthropathy. And you may also hear this called spondylosis or axial facet pain. And that is basically in people who have pain in their joints of their back, generally in a kind of bend-like distribution across the low back when they're standing and walking. They'll get pain in the back that is really hard to bear and thus they have more trouble standing, oftentimes find themselves sitting down having to bend forward to relieve the pressure on the joints of the back.

In this case, what we oftentimes will do is an ablation procedure where we go down under X-ray and bring a needle just into the area next door to where the pain sensor lives. And this nerve here is called the medial branch nerve. What we oftentimes will do is do some...we call it blocks, and that entitles putting some numbing medicine next to the joints to numb a very specific pain sensor nerve that goes to the joint. And that's called the medial branch nerve. We can call it a nerve block or a medial branch block. The basic principle there is to test to see if the pain is coming from a specific area. And that's one of the tools we use

to see is the pain coming from a joint, is it coming from a pinched nerve or some other kind of structure? And so in this case, what we're talking about is patients who have pain from arthritis of the joints of the back will do some basic X-ray-guided injections to try to diagnose that as the problem by putting numbing medicine, local anesthetic near to that joint to numb up the joint. That's a temporary test. It will only last hours to days generally but allows us to detect and prove to ourselves that the pain is coming from those joints. That's a several-step process, but the end result involves a procedure called an ablation.

The most common type of ablation we're using these days is called radiofrequency ablation. And that involves taking a needle, again, I'm gonna use my pen as an example, and with the tip of that needle, we use the tip of the needle, which has a special radiofrequency energy generator, to use that radiofrequency energy to vibrate the tissues around that pain sensor nerve, thereby disrupting or destroying the little pain sensor. We're not damaging the major nerves of the spine. All we're doing is taking away the pain sensation just from that pain sensor nerve. And that involves putting a patient under X-ray, again, bringing a needle down into that area where the pain sensor is, and zapping it away with radiofrequency energy. While that's not a permanent fix, as those little peripheral nerves, those little peripheral pain sensors regrow, it is generally a long-lasting procedure, sometimes lasting a year or more. And that procedure we call radiofrequency ablation. If you talk to your doctor about that, you may hear it called several different things, radiofrequency ablation, rhizotomy, or an ablation procedure. The other common thing we abbreviate is called RFA, Radiofrequency Ablation. And that is very commonly used in patients who have axial back pain, pain in the general low back that we suspect is coming from arthritis of the joints of the back, and can be a very effective procedure and help a lot of patients who have really not responded to anything else, including medicines, physical therapy and other treatments through their primary care doctor or other specialists.

So, to recap, those are the two most basic and common procedures that a pain doctor would do for a patient who has one of the more common pain issues, either back pain or sciatica pain. So, those two procedures, again, are epidural steroid injections and RFA, which is Radiofrequency Ablation. Those are kind of the basics you'll see in most practices to give you an example in terms of back pain issues. There are a whole host of much more advanced procedures that we are performing nowadays for very specific indications.

I'm gonna pause there and I'm gonna turn that over to my partner, Dr. Emanuel Zusmer, who'll talk a little bit more about what those more advanced

procedures entail and go through the basics of those procedures, knowing that they are indicated for very specific indications and that when you come to a pain doctor's office, we wanna make sure we tailor everything to your exact pain issue. So, with that, I'll hand it over to Dr. Zusmer who will take it from there.

Dr. Zusmer: Thank you, Dr. Reimer, for that wonderful presentation. And what Dr. Reimer has done is really given you a lot of the framework to understand some of these more advanced procedures and treatment options that we have at our disposal.

So, the first one I'm gonna start off with is something called spinal cord stimulation. What is it? So, at its core, spinal cord stimulation is the application of electrical fields to the spinal cord to help decrease pain signals coming into the central nervous system. Now, this therapy is not new. It's been around in its modern forms since the 1970s, but treating painful issues with electricity actually dates back to the Egyptian times in which they used electric eels to treat various painful issues. Now, this is an FDA-approved non-drug therapy and it's used to treat multiple different conditions. Some of the most common conditions that it's used to treat I'll lay out right now, but there is an ever-expanding list of conditions. And so some of the most common ones that we will employ this therapy for are chronic neck, back extremity, whether it be upper extremity, lower extremity pains, a disorder called complex regional pain syndrome, postherpetic neuralgia, certain vascular disorders such as chronic angina or Raynaud's, and then peripheral neuropathies, whether they be due to diabetic neuropathy or unknown causes.

Now, this is not a treatment that we typically go to straight away. This is typically a treatment which is reserved for patients who have failed some of the more conservative and less invasive treatments. Studies have shown that this treatment can be very effective for patients to help them avoid ever needing a back surgery. For patients who are considering having reoperations due to chronic ongoing lower back and extremity pains, this can be equally effective if not more effective in treating those pains.

And so to go over just the brief overview of how this procedure works, there's two phases to it. There's a trial phase, which we call the try-before-you-buy phase, and then there's an implantation phase where we actually implant the device permanently. So, during the trial phase, we implant these two tiny electrodes into the epidural space. This is all done through needles, meaning percutaneously. It's done at the outpatient surgery center and takes about 30

minutes to do. Now, we place these two specialized catheters in place and we leave those in that location for a week. And those wires that are external are connected to a special computer. And over the course of that week, we adjust the settings of that computer to hopefully get your pain issued down by roughly 50% or more. Fifty percent is really the target we're looking for. If we could reduce your pain by at least 50% or more, then we can move on to the implantation phase.

The implantation phase is done on a completely different day. And during the implant phase, we actually implant these little electrodes into the same spot, the epidural space, but then we connect it to a specialized generator that's about the size of a silver dollar. And this gets implanted underneath the skin and those wires are attached to this underneath the skin. So, nothing is actually external or visible to the naked eye. Now, once this is in place, this device is working constantly in the background helping to control whatever painful issue you may have. Now, these devices do, for the most part, need to be recharged. There are some non-rechargeable devices, but for the most part what we're implanting are rechargeable generators. And so the way these devices are charged are through the skin, so transcutaneously. And depending on the settings, you may have to recharge it every couple of days to every couple of weeks. These devices, the newer ones, are also MRI-compatible. So, if you do end up needing to have an MRI at a later date, that's not gonna be an issue.

Now, these are outpatient procedures. You're typically discharged within an hour after the implantation of this device. And the recovery time is minimal. It usually takes about eight weeks to recover from these procedures. And during that period of time, we ask that you do no BLT, which is bending, lifting, and twisting. And when we say that we mean no extremes of bending, lifting, twisting. You're not gonna be going to the golf course during this period of time because what needs to happen is these special leads need to heal in place. And, you know, during that period of time, they're at risk for migration. So, if you're doing any extremes of movement, there's always a potential for these leads to pull back and the therapy at that point might be less effective. So, this is a great option for patients with some of those aforementioned conditions I discussed.

Now moving on to a different procedural option, this is called the Vertiflex procedure. And the Vertiflex device is this little interspinous spacer right here. And this is a minimally invasive procedure which is used to treat moderate spinal canal or foraminal stenosis of the lumbar spine. So, if you have narrowing in the thoracic or cervical spines, this device is not indicated. It is for the lumbar spine.

Now, what is stenosis? So, stenosis, what it is at its core, and Dr. Reimer touched upon this, but it's narrowing around the spinal cord or nerve roots where they exit the spine. This is a very common condition. Roughly 8% of the general population has this. And it's more common in patients over 50 and it's pretty evenly distributed between men and women. Now, this narrowing around the spinal cord and nerve roots can cause symptoms, namely pain, but it can also cause various other symptoms. It can cause numbness, tingling, it can even cause weakness into your extremities.

Now, when we talk about lumbar stenosis, there's some specific traits that it may have, and one of them is that you may notice increased pains when you stand up and walk. And this may be accompanied by some of the other symptoms that I discussed such as numbness, tingling, or weakness. Why does it get worse when you stand up? Well, the reason it gets worse is that when you stand up, the caliber of the tunnel through which the spinal cord runs and where the nerves exit the spine actually narrows down. So, you can see, when you stand up, your back extends much like this. And what's happening now is those little tunnels through which the nerves are exiting narrow down as well. And that happens in the tunnel that surrounds the spinal cord as well. That narrowing can actually cause symptoms and these pains that you may be experiencing. And so what patients frequently do to compensate is that they bend forward. What that does is it's opening up these tunnels. And so we call that the shopping cart sign.

So, you know, a frequent question that I ask, and I'm sure Dr. Reimer asks as well, is, you know, if you're at the grocery store and you're using a shopping cart, bending over it, does this help to reduce or eliminate your symptoms? Does it allow you to walk further distances? After walking a city block or two, if you're developing the symptoms, does sitting down and bending over help to eliminate that? Well, if that's the case, then you may have spinal stenosis.

Now, the Vertiflex device was developed to prevent that area of narrowing from becoming exacerbated when standing. So, this little device, it's placed through a tiny incision, about two centimeters, it's FDA-approved, and it goes between these spinous processes. And we put it at the level of this narrowing. And you can see now when I try to compress that area of the spine and narrow that tunnel, it doesn't occur. And so that is the main principle behind the Vertiflex device. Now, this is an outpatient procedure. Patients usually go home, just like spinal cord stimulation, within about an hour afterward. Minimal recovery time. We do have roughly an eight-week period of recovery

where we have the same requests where you do no significant bending, lifting, twisting.

One of the neat things about this device is that we're not burning any bridges. And what I mean by that is that we're not removing any bone, we're not removing the spinous processes, we're not doing anything which can't be undone. And I think you'll find that's a theme within our field of medicine is we're trying to do minimally-invasive procedures to prevent you from having surgery. And so a lot of what we do can be undone. So, you know, for instance, say, we place this device, you get a couple years of pain relief, and then ultimately it has to be removed for a surgery. Well, at the time of surgery they could simply just remove this device and we're not burning any bridges by doing so, whereas if you undergo a big surgery, this may mean that they're removing large sections of bone, they're fusing segments. And so with that in mind, you know, from a pain perspective, recovering from this procedure is much easier than if you were to have a large spine surgery. And the data supporting this device is very robust. It's actually, you know, pretty atypical to have a study which follows a device out five years. And there is good five-year data to support the use of this. At that 5-year mark, 85% of patients had reductions in their medication use, 81% of patients had improvement in physical function in general, and there was a 75% reduction...or 75% of patients had ongoing reductions in their leg pains. So, it's not only important to use a device which works, but we wanna use devices that have meaningful, long-term pain relief. And this and spinal cord stimulation both do.

Now, there are some restrictions to using this device. And just to kind of go over the main ones. Now, of course, if you've had surgery at the site that we wanna place this device, that may limit our ability to do so or may be a reason for not being able to place it. If these spinous processes are narrowed down to the point that they're touching each other, there may not be room for the device. Also, if there's instability at this level where the vertebral bodies are slipping on top of one another...this is called listhesis. If it's anything over what we call a grade one listhesis, meaning there is some significant slipping of the vertebral bodies, well then this device most likely wouldn't be effective because it won't stay in place. It'll slip out of its position when these vertebral bodies slip on top of one another. Of course, some of the other things include if there's severe scoliosis of the spine, so significant twisting of these spinous processes on top of one another, if there's fractures at this site, if there's severe stenosis. So, this device is actually indicated for moderate stenosis. There are some situations in which we would use it for moderate to severe stenosis, but typically patients

with underlying severe stenosis don't qualify. And then if there's multiple levels of stenosis, meaning greater than two, we typically wouldn't use this device. Of course, there's always exceptions, but this device is only indicated for treating two levels of stenosis. So, if your whole lumbar spine is narrowed down, this would be a reason why we probably wouldn't choose this device.

Now, another advanced procedure that we have is something called kyphoplasty. And this is a procedure which is used to treat compression fractures of the vertebral body. So, much like long bones of the body such as your arm, your leg can get fractured, your vertebral body can get fractured. But fractures in the vertebral body are much different than fractures in long bones of the body. Long bones in the body tend to just snap in half. Fractures into the vertebral bodies tend to cause compression of these areas. So, the vertebral bodies actually narrow down, and we call these compression fractures. Now, these, as you could imagine, occur more commonly in elderly individuals because they have a higher incidence of osteoporosis or underlying health issues. With that being said, the number one cause of compression fractures is osteoporosis or bone demineralization, but there are various other causes for compression fractures which include metastatic cancers or multiple myeloma. Now, 1.5 million fractures in the U.S. are attributable to osteoporosis, and surprisingly almost half of those are compression fractures in the spine.

What would be some of the symptoms of a compression fracture? Well, this could be the sudden onset of severe back pain, which, you know, may be refractory to some of the conservative care measures such as rest, ice, heat, avoiding activities which trigger pain, could cause limited mobility, increased pain while standing or walking. And if you've ever seen patients who walk around with a hunchback or they're bent forward, more often than not these patients have had compression fractures, and maybe multiple compression fractures, and that has led to this deformity.

Now, the procedure itself is another minimally-invasive procedure. And this is a figure which kind of shows how this procedure is done. So, we take a specialized introducer needle and we insert it into the vertebral body that is compressed. And inserting this introducer needle into that area allows us to deploy a balloon into the area of compression. And what we do is actually inflate that balloon, which creates a cavity that allows us to inject cement, and that cement allows us to stabilize this fracture. And by doing so, it can not only help with pain control, it can help further compression of this fracture.

Now, there are other treatment options that we typically employ before we get to these invasive types of therapies, and those are, you know, some of the conservative care measures that I talked about, some of the other things that I was mentioning before. So, really, we reserve this for patients who are in severe pain, not responding to conservative care measures, or who have failed other treatment options. One of the benefits of doing this procedure in addition to the fact that it can help with pain control is the fact that it can help reduce fractures at adjacent levels. So, what happens when we have a fracture into one of these vertebral bodies is there's an anatomical change, and that anatomical change can actually cause increased load onto the vertebral bodies above and below it. So, it can actually put these other vertebral bodies at risk for fracturing. So, by doing a kyphoplasty and stabilizing this vertebral body, we're actually reducing the risk of having what we call adjacent-level fractures. So, that's another benefit to doing a kyphoplasty, doing it early. Very rare to have side effects from a kyphoplasty, much like any of the other procedures I discussed. Very rare to have any complications such as infection, damaging a nerve, having increased pain afterward. These will all be very uncommon things. And like the other procedures I mentioned, and even more so for kyphoplasty, the recovery time is minimal.

So, moving on to kind of additional treatment options for your pain. Now, it's great to employ interventions. If they can be targeted and beneficial, we're more than happy to discuss interventional therapies, but that's just one piece of the pie and that's how I kind of like to look at all the different things we can offer patients. They're all small pieces of the pie and together these pieces of the pie can be synergistic. And so we may not just employ one treatment option, we may employ multiple different treatment options to address your pain. And in unison, all these different things are more helpful than just giving you one specific treatment alone. Now, like Dr. Reimer mentioned, you know, despite preconceived notions, when it comes to medications, we prefer to avoid prescribing opioid medications.

And I frequently have patients who come in, you know, for initial consultation and they go, you know, "I was really hesitant to come see you because, you know, I really don't like pain medications. I really don't wanna be started on them." And those are actually some of my favorite patients because I don't wanna start you on them either. That's really can be our option of last resort in most situations. We wanna reserve opiates for patients who have failed conservative care measures, interventions. And data has shown that opiates are not beneficial in the long-term treatment of many different painful issues. So,

you know, with that being said, there are other medications that we may employ. And I'm not gonna delve into the details of all that. But these include medications in the antidepressant class of medications, in the anticonvulsant class of medications, we may prescribe topical medications. There's a whole laundry list of medications that may be helpful in treating a specific painful issue and we will recommend those as necessary.

Now, in addition to medications, we also recommend things such as physical therapy. What can frequently happen when a patient has a painful extremity or a painful area is that they tend not to use that body part or extremity as much. And what can happen over time is you can develop weakness and atrophy on the muscles and then functional deficits. And so one of the points of physical therapy is to work on preventing that from happening. That in addition to just a generalized rehab program working on strength, stretching, conditioning can be dramatically beneficial for pain issues.

Now, other types of things that we may recommend include what we call CAM therapies, Complementary Alternative Medicine therapies. And this includes things such as acupuncture, meditation, tai chi, what I term mindfulness-based therapies. What can frequently happen or what I frequently see is that patients who have high levels of anxiety, depression, they tend to have higher levels of pain. And that kind of parks back to the mind-body connection. When we are dealing with life stressors, we're depressed, we have high levels of anxiety, maybe financial issues, that tends to ramp up your nervous system. And by ramping up your nervous system, you are ramping up this pain circuitry, and it could really precipitate any underlying painful issue you have. So, by prescribing some of these mindfulness-based therapies, we're addressing that component of the pain.

And so along those lines also, you know, we may refer patients out to a psychiatrist or a therapist to talk about their issues. It doesn't necessarily mean we think you have a psychiatric issue, more so it means that by addressing some of your depression anxiety, it may help to kind of turn the volume button down on some of these pain pathways. So, that may be a component that we recommend.

So, there's really lots of different tools in our toolbox that we have at our disposal to use in helping to treat any type of painful issue. And our goal is to get patients in early because the earlier we get them in, the more effective a lot of these treatments are. So, to summarize and wrap everything up, you know, pain can occur due to various reasons. In some cases, it's a normal part of aging.

In other cases, it's not normal and may have developed due to an injury, a viral illness, endocrine abnormalities such as diabetes. In some instances, it occurs for no reason at all. But our goal, as pain physicians, is to intervene early and to employ multiple modalities to reduce or eliminate this pain and get you back to doing the things you love. Thank you for joining us on this presentation tonight, and I hope it was of benefit.



Dr. Ransohoff: Thank you for joining us for "Sansum Speaks." We hope you found this to be valuable information. To view all of our talks, please visit sansumspeaks.sansumclinic.org.



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