THE INTERVENTIONAL ORTHOPEDICS SOLUTION FOR

LUMBAR SPINE PROBLEMS

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In interventional orthopedics, we recognize that the body is actually one interconnected machine, not a collection of individual parts and pieces. The lumbar spine is a crucial piece in our musculoskeletal puzzle. Structures such as the hip, knee, ankle and foot are all controlled by spinal nerves in the low back, and a problem in the lumbar spine can create problems at any point in the lower-body chain. In interventional orthopedics, our focus is on treating the whole musculoskeletal system.

There are many problems that can occur in the lumbar spine. Some of the more common include arthritis, foraminal stenosis, pinched nerves, disc problems, and spondylolysis. We will review some lumbar spine problems as well as some traditional and interventional orthopedics solutions. First, let's look at the structure of the spinal column.

The Spinal Column

Your spinal column, or backbone, is made up of vertebrae, stacked one on top of the other, with an intervertebral disc between each level to provide cushion and absorb shock. The cervical spine makes up the neck area and consists of seven vertebrae (C1–C7). C1 is at the very top of the spine. The cervical spine is followed by the thoracic spine (T1–T12), the lumbar spine (L1–L5), and the sacrum (S1–S5) and the coccyx (four fused vertebrae commonly known as the tailbone).

The posterior (back) part of these vertebrae are the spinous processes (which you can feel if you run your fingers down your back), and on either side of these, connecting one vertebra to the next, are finger-joint-sized articulations called the facet joints. So the five vertebrae of the lumbar spine have a total of ten facet joints. The spinal canal is a tunnel that runs down the middle of the column and houses the spinal cord, which has many nerves that transmit muscle commands and sensory information throughout the body and to the brain. The spinal column also has small holes where the nerves exit and branch off to other parts of the body. There is one at each level. One hole is called a foramen. The plural is called foramina.

Any of these structures in the lumbar spine can become damaged or diseased in some way and lead to pain, discomfort, even disability. Let's start with foraminal stenosis.

Foraminal Stenosis

The foramen is shaped like a tunnel that exits off of the spinal canal, and the spinal nerves for each specific level traverse, or go through, them. When the spine is healthy, these nerves easily traverse the tunnel, properly transmitting sensory information from each part of the body to the brain. When the spine is not healthy, however, this can disrupt the flow of information.

The disc, that cushion between the spine bones, can bulge, or the spine joints can get arthritis, causing the foramen to narrow. This narrowing of the tunnel is called foraminal stenosis, and this can cause the nerves to get pinched. The pressure from a pinched nerve can cause muscle tightness, weakness, numbness, tingling, or pain in the specific distribution of that nerve. So, for instance, if there is foraminal stenosis in the level of the lumbar spine where the nerves branch into your leg and down to your toes, you could experience numbness (or one of the other sensations mentioned) all the way down in your big toe. Tingling in your fingers or tightness in the biceps muscle, for example, could be from foraminal stenosis in the level of the cervical spine where the nerves branch into your arm muscles and fingers.

Laser spine surgery can open up the hole, but this surgery can have major side effects and can have serious implications, such as damage to the thoracodorsal fascia. A spinal fusion is another way to surgically treat stenosis, but the mention of a fusion should be your red flag to seek other opinions. Why? Adjacent segment disease (ASD) can happen, which means that the levels above and below the fusion can get damaged over time.

Additionally, surgery is often performed after diagnosing the problem solely based on findings on an MRI. An MRI indicating stenosis isn't enough to appropriately diagnose that stenosis as the cause of back pain, and because of this, if you have a foraminal stenosis, you really shouldn't put all your trust in an MRI. Patients may or may not have back pain with a foraminal stenosis, though they may have pain in another location, such as the knee or shoulder. Research also shows that physical therapy is as effective as surgery in relieving stenosis.

The interventional orthopedics approach to foraminal stenosis utilizes nonsurgical regenerative medicine solutions to treat it before it progresses. Injections of the patient's own platelets into the foramen and around the nerve can help manage the problem and keep it under control.

Spinal Instability and Degenerative Joint Disease

Joints can become unstable (e.g., craniocervical instability, shoulder instability, and hip instability) and havoc can ensue when it goes unnoticed and untreated. Like with any joint, when a damaged facet joint in the spinal column is left untreated, and even unidentified, instability can set in, leading to pain, swelling, and more advanced diseases, such as degenerative joint disease (DJD). This can then lead to severe foraminal stenosis (see above).

The surgical approach for severe DJD might be a fusion. A spinal fusion involves installing hardware, such as plates and screws, to bolt the vertebrae together, rendering them immovable and oftentimes disrupting the normal curves throughout the entire spinal column. It's a limiting, irreversible procedure that can cause adjacent segment disease in the vertebrae above and below, and it should only be considered in the most extreme cases.

The interventional orthopedics approach for severe DJD of the spine could be high-dose PRP, platelet lysate, or stem cell injections. If the problem is caused by or created problems in the ligaments, such as the supraspinous and interspinous ligaments, these can be treated with orthobiologic injections as well. No surgery, no installed hardware, and no destruction of the tissues are required for these advanced injections.

Facet Joint Arthritis and Other Facet Problems

The facet joints, those finger-joint-sized articulations on either side of the spinous processes on the back of the spine can, like any other joint, become injured from trauma or develop arthritis from cartilage breakdown due to wear and tear or other issues. Facet joints allow for, and limit to a certain degree, movement in the spine. When you bend backward, these joints become compressed, and when you bend forward, they open up. Rotation in the lumbar spine, however, is limited to about 12 degrees in either direction, compared to about 40 degrees in the thoracic spine 90 degrees in the cervical spine. When damage or arthritis occurs, facet joints can become chronically painful and uncomfortable, especially with movement.

Facet cysts can also develop when a facet joint gets arthritic and swollen. A facet cyst is simply a fluid-filled expansion of the covering of the joint (called the capsule). The joint can balloon out in a few common places, and one of those can put pressure on the nerves in the spinal canal, causing pain in the spine or anywhere along the branch of the affected nerve (e.g., in the leg if the cyst is in the lumbar, or lower, spine). Facets cysts are the most common in the lumbar spine.

The surgical approach to the facet joint depends on the problem. For arthritis or injuries where inflammation may be irritating nerves, surgeons may recommend an ablation (destruction) of the affected low-back nerve. Another surgical option presented could also be a lumbar fusion to bolt two or more vertebrae of the spine together, thereby eliminating movement and, in theory, pain. For a cyst, the surgeon will create a tunnel to get to the joint. Typically bone will be removed (laminectomy) to be able to access the spinal canal. Then the cyst is excised. However, the nature of the surgery will damage some of the muscles that stabilize the area.

The interventional approach is nonsurgical and involves injecting the patient's own concentrated blood platelets and stem cells to help treat facet injuries and arthritis. For a cyst would we would either pop the cyst using an injection technique, or if the cyst comes back, the newer option is to pop or drain the cyst and inject PRP or stem cells. These biologics that may be able to initiate some repair of the damaged joint or at least turn the toxic environment in the joint into a better one that won't stay swollen and painful.

Disc Problems (Herniated, Bulging, Torn, or Degenerated)

There are four common types of disc problems that can occur in the lumbar spine. A herniated disc is when the outer covering of the structure breaks open letting the inner gel herniate out. A bulging disc is when the outer covering doesn't completely break open but the fibers are stretched and weak, leading the inner gel to cause bulging. A torn disc is when the outer covering gets a tear that doesn't result in a herniation or bulge but does cause pain due to ingrown nerves or the disc leaking nasty chemicals on the associated spinal nerve. Finally a degenerated disc is one that has collapsed due to few living cells inside causing a lack of production of the chemicals that usually plump up the disc.

The surgical solution for lumbar disc problems depends on the disc problem. Generally, disc surgeries include either back fusions or disc replacement, both of which we consider surgical damage to accomplish a goal. In both cases, the damaged disc tissue is removed. With the fusion, the vertebrae are then bolted together with hardware to make them immobile, which can lead to adjacent segment disease (ASD) and other problems. With the disc replacement, the idea is that it should have fewer side effects than a lumbar fusion; however, research has shown that abnormal motion with the artificial-disc device can lead to ASD, and other side effects of the device include wear-and-tear ions in the blood from the breakdown of the metal or plastic device, ongoing pain, and revision surgeries.

In interventional orthopedics, we recognize that different disc-injury types need different regenerative medicine solutions. With herniated and bulging discs, we find it's best to instill isolated growth factors, or platelet lysate, around the irritated nerve rather than inject the disc. The focus is to ramp up your body's own natural repair mechanisms, which can get rid of the herniated disc. Some bulging discs may be able to be treated with a same-day stem cell treatment to reduce the size of the bulge, but others may require specially cultured stem cells injected in a specific fashion (i.e., not same-day stem cells); however this technology is not yet available in the U.S. Torn discs, in our experience, can be treated with stem cell or PRP injections. Degenerated discs don't respond to any type of stem cell treatment, including specially cultured stem cells. However, in our experience, it can respond to a treatment protocol focused on platelet and/or stem cell technology deployed to treat sloppy disc movement due to lax ligaments and arthritic facet joints.

For more in depth information about disc problems, read our separate report "The Interventional Orthopedics Solution for Intervertebral Disc Problems."

Pinched Lumbar Nerve

There are a number of conditions that can cause a pinched nerve in the lumbar spine, such as foraminal stenosis, bulging or herniated discs, and facet-joint arthritis (all discussed more in depth in their related sections of this report). A pinched lumbar nerve can cause pain or numbness anywhere along the route that particular nerve branch supplies, including the butt, hip, and knee. Pain may or may not exist in the low back. So a pinched nerve can cause problems in and of itself, but it's important not only to treat the pinched nerve but also whatever caused the problem (e.g., stenosis, disc bulge, etc.).

Additionally, it's important to understand that chronic knee pain, for example, could be due to a pinched nerve, or other problem in the lumbar spine, especially if it's accompanied by low-back pain. However, if a pinched lumbar nerve is presenting as knee pain without back pain, it's easy for your doctor to diagnose knee pain based only on MRI findings of the knee (e.g., arthritis, meniscus tears, and so on that can just be normal wear and tear with age, not a major source of pain). This is why in interventional orthopedics we find it so important to examine the musculoskeletal system as a whole unit rather than in parts and pieces.

The surgical approach to a pinched nerve depends on the cause of the pinched nerve. If it's a disc bulge, for example, it could be a discectomy and graft and/or a lumbar fusion (see "Disc Problems" in this report). If it's a foraminal stenosis, it could be a laser surgery to enlarge the foraminal opening where the nerve is being pinched (see "Foraminal Stenosis" in this report). Unfortunately, even knee replacements, for example, are a possibility if the pinched nerve is presenting as chronic knee pain and surgery is recommended based primarily on knee MRI findings rather than an examination of the full musculoskeletal system. Problems with any invasive lumbar surgery are many and varied, including lengthy recovery times and often continuing pain, and the structure never fully functions like it originally did, especially following fusion surgery.

The nonsurgical interventional orthopedic approach is to examine the full musculoskeletal system to determine the source of the pain and the pinched nerve and to then develop the proper treatment plan. Treatment could be precise image-guided injections of healing growth factors isolated from a patient's own blood platelets, PRP, or stem cells. The differences between traditional spine surgery and the regenerative or Orthopedics 2.0 approach are stark.

Spondylolysis

Spondylolysis is the Latin term for, literally, "cracked spine." Some kids are born with weak areas in their spine with the most common place being the pars interaticularis. This literally means the "part between the joints." This is the piece of bone that lives between the low-back facet joints. It's also called the "pars" by many doctors. For some kids, the area is never connected by bone, and for others, it's a bony weak spot waiting to break. These injuries are common in gymnasts, wrestlers, and other athletes who place tremendous stress on their spines. When they occur, they cause back pain that's usually worse with bending back.

When physical therapy fails, many end up with fusion surgeries that use plates or screws to hold the area together or other surgeries. Surgery for spondylolysis is a big problem. Many will be able to heal the problem with just bracing or PT, but for those who want to return to competition and can't heal the fracture, surgical fusion is often recommended. Unfortunately, however, back surgery will destroy important spine stabilizer muscles (multifidus), so many who end up with surgery have complications at a later date.

Additionally, as mentioned before, with fusion comes adjacent segment disease (where the normal levels above and below can develop problems due to overload).

In interventional orthopedics, we use high concentrations of the patient's own stem cells to help the body close the nonhealing pars-defect fracture. Rather than surgically implanting them, in interventional orthopedics, we use precise image-guided injections. More recently, we've been using that same basic technology to treat spondylolysis fractures in young adults who would otherwise be facing a massive fusion surgery.

Steroids, NSAIDs, and Other Drugs Not Recommended

Other treatments you will likely be presented with in the traditional orthopedics model for lumbar spine problems include steroid shots or pain medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs) and opioids. NSAIDs come with a long and growing list of dangerous side effects, such as sudden-death heart attacks, stroke, and GI bleeding, and addiction and overdose due to prescription opioids have reached epidemic proportions in the U.S.

Steroid shots have been shown to destroy local cartilage in the joint (which can only progress arthritis) while providing no significant pain improvement. In fact, pain relief usually diminishes with repeated steroid injections. And the list of problems with steroid injections just keeps growing:

Steroid injections weaken the tendons.

Steroid injections damage tissues.

Steroid injections are toxic to joint cartilage cells.

Steroid injections kill stem cells.

Steroid injections suppress brain function.

Some supplements can be a good alternative for pain and inflammation. Chondroitin and glucosamine have been shown to be effective pain relievers, and they preserve cartilage. Curcumin can also relieve pain from arthritis and other issues.

Conclusion

Your spine is tuned to micromillimeter precision, and trying to rearrange the biomechanics of the spine with lumbar fusions and other surgeries is almost always a terrible idea. It's also important to understand that where it hurts may or may not be where the primary damage is located. If you have knee pain, for example, and treatment there is having no effect, ask your doctor to take a closer look at your lumbar spine before you make the drastic decision to undergo any invasive surgery on your knee.

Taking care of a lumbar spine problem while it's a small problem, when the issue first appears, will be much easier than trying to take care of it when it becomes a big issue that spirals out of control. While conservative options may help in some cases, if these conservative options have failed, seek interventional orthopedics solutions.

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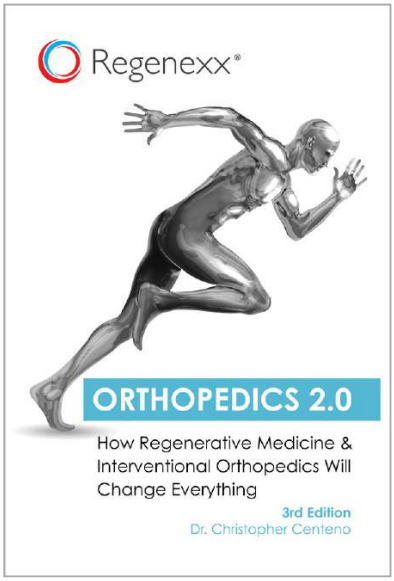

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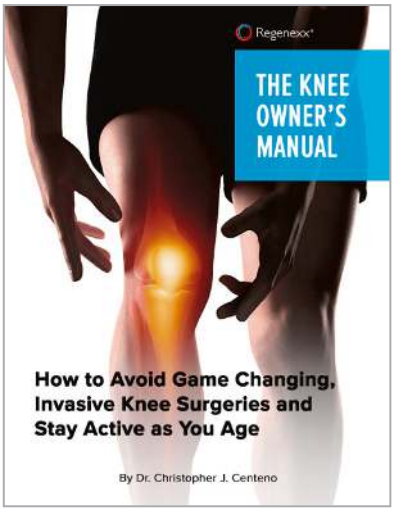
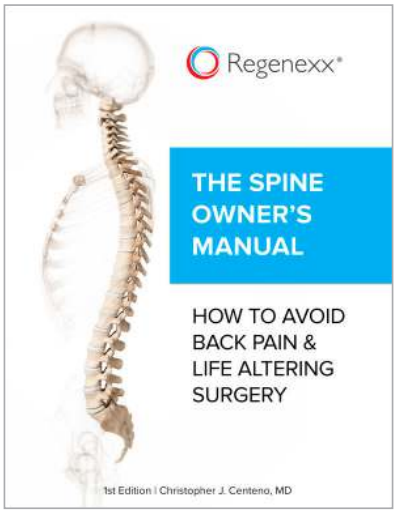


The Spine Owner's Manual



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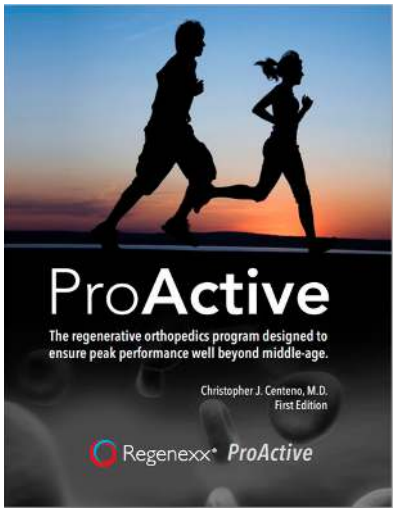

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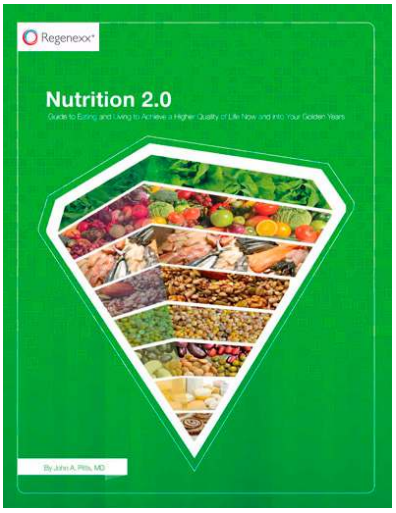

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