INTERVENTIONAL SPINE PROCEDURES

FLORIDA ORTHOPAEDIC INSTITUTE
Keeping you active.
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At Florida Orthopaedic Institute, our goal is to help you live a higher quality of life by relieving your pain and keeping you active. Our staff of highly-trained pain management professionals is committed to providing exceptional patient care with comprehensive and innovative treatment options.

Florida Orthopaedic Institute physicians are board-certified and have additional fellowship training in their subspecialty and are considered experts in performing these procedures.

We also have two outpatient surgery centers for patient convenience. Additionally, our physicians work in combination with Foundation for Orthopaedic Research and Education (F.O.R.E) to stay at the leading edge of pain relief advancements.

At Florida Orthopaedic Institute, we understand that pain can have a debilitating impact on a patient and the people in their lives. Our expert pain physicians and staff apply the latest technologies for diagnosis and treatment of the underlying condition after careful evaluation and tests.

We use the latest high-resolution imaging technology including digital X-rays, Musculoskeletal Ultrasound Imaging, Electromyography (EMG), Nerve Conduction Velocity (NCV), Computerized Tomography (CT scan) and Magnetic Resonance Imaging (MRI) to diagnose spine conditions.

Chronic and acute pain conditions are treated with a multidisciplinary approach incorporating interventional techniques, drug management, physical therapy, and chiropractic methods. Our multifaceted approach gives each patient an individual and personalized treatment plan.

This informational booklet contains some of the interventional spine procedures performed at Florida Orthopaedic Institute. Check with your physician as not all physicians perform all procedures, and new procedures are being added constantly.
Epidural Steroid Injections

Epidural steroid injections are a combination of a strong anti-inflammatory medicine and a pain relief medicine that is injected into the nerve root, facet joint and sacroiliac (SI) joints with guidance from a fluoroscope (X-ray machine). This procedure reduces inflammation and pain. It can help reduce radicular pain in your arm or leg from pressure and irritation on one of the nerves.

During the epidural steroid injection procedure, a fluoroscope helps identify the specific area to be injected. A needle is inserted into the small space surrounding the nerves inside the spinal canal (the epidural). A special X-ray dye is sometimes used to verify that the medication (a long-acting anti-inflammatory steroid and local anesthetic) is delivered appropriately.

Depending on your physician’s specific treatment plan for you, epidural steroid injections are sometimes administered in a series of two to three doses. Typically, this is five to seven days following your first injection.

Most patients report relief in 48-72 hours, but it can take several days for the medication to affect the symptoms. It can take up to one to two weeks to notice the benefits.

Nerve Root Injections

Nerve root injections assist in determining which nerve root is responsible for your leg or arm pain. They may also be used to decrease the pain from an inflamed nerve.

Before the injection, you will rate your pain on a scale of 0-10, with 10 being the worst pain you are experiencing.

A small needle is placed into the nerve root sheath (the layer of tissue that surrounds the nerve) using a fluoroscope (a type of X-ray) for guidance. When the needle approaches the nerve root, you will experience some immediate discomfort which helps with the injection placement.

Your doctor verifies the correct placement of the needle with a small amount of anesthetic. A larger dose of local anesthetic is then injected once the accuracy of the placement is confirmed. Once the anesthetic is injected, you should experience immediate relief. Your doctor will ask you to communicate to them when relief is felt and where the pain is on a scale of 0-10.
Medial Branch Block

Medial branch nerves send pain from small joints between vertebrae (the facet joints) located along a boney groove in your back and neck. While the facet joints nerves do not control any muscles or sensation in your arms or legs, they can be a source of pain.

If you have pain in this area, you may also benefit from having the small medial branch nerves treated non-surgically with radiofrequency heat using a special needle. The nerve signal is blocked with numbing medicine as a test before actually treating the nerve with radiofrequency heat at a later date.

During the Medial Branch Block procedure, you may be given a relaxation medicine through an IV, if needed. After cleaning and numbing a small area of skin, your physician will use X-ray guidance to direct a tiny needle over your medial branch nerves. A small amount of numbing medicine is injected around the nerves.

You can resume activity after 20-30 minutes, reporting your pain level on a scale of 0-10. Then you will record your pain level and activity level every hour during the next 8-10 hours in a pain diary and bring the completed pain diary to your next scheduled office appointment.

Coccyx Injections

Many treatments can help reduce tailbone pain (coccydynia). If self-care measures, specially-designed cushions, over-the-counter medicines or physical therapy do not work, a coccyx injection may be recommended.

Corticosteroids injected into the area around the tailbone can reduce inflammation and pain. They can be combined with a local numbing medication (anesthetic) to make them even more effective.

They can help relieve the symptoms of coccydynia, although the effects may only last for a few weeks. They will not cure the condition. Too many injections can damage your tailbone and lower back, so this type of treatment is usually only done once or twice a year.

Injecting local anesthetic into the nerves that go into the coccyx can also help reduce pain. Like steroid injections, the effect may only last a few weeks or months. Unlike steroid injections, it is usually safe to have repeated injections of local anesthetic.
Intradiskal Electrothermal Therapy (IDET)

Intradiskal electrothermal therapy (IDET) is a reasonably new minimally invasive procedure designed to relieve back pain caused by degeneration to the discs in the lower back. Intervertebral discs sit between the vertebrae and act as shock absorbers for the spine. They are flat, round and about half an inch thick. They are made up of two components—a center with a jelly-like consistency and a flexible outer ring.

As you age, these discs can develop breaks in the outer disc ring. In an attempt to repair the damage, blood vessels and pain fibers grow into the area. These small pain fibers can be the source of chronic back pain.

In intradiskal electrothermal therapy, the surgeon applies heat to the damaged disc wall with a special catheter. The heat contracts the collagen in the disc wall, sealing the cracks and allowing the collagen to rebuild the structure.

An MRI of the lumbar spine and an injection of dye into the disc (discography) are used to precisely locate the source of the pain.

During the IDET procedure, a needle is placed in the disc using guidance from an X-ray. A catheter with a heating coil is inserted in the needle into the affected area in your disc. The heating coil seals the fissure in the disc wall and removes the small nerve endings that carry pain signals from the site.

Most patients report gradual pain relief after 3 to 6 months. Patients usually have to avoid lifting, twisting, and bending or sitting up for extended periods for up to 3 months following the procedure. You may need to wear a back support for 6 weeks following surgery to protect your spine and allow the area to heal.

Sacroiliac (SI) Joint Injections

The sacroiliac joints are small joints in the low back and buttocks where the pelvis joins with the spine. They are responsible for the movement between the sacrum (the shield-shaped bony structure located at the base of the lumbar vertebrae and connected to the pelvis) and the main bones of the pelvis. As we age, the bony structures of the spine stiffen and lose flexibility, causing pain in the low back, buttocks, abdomen, groin, or legs. Often, pain can be relieved with a sacroiliac joint injection.

In the SI procedure, a small amount of contrast material is injected to expand the sacroiliac joint area, using an x-ray guidance machine.
Your doctor is looking to reproduce discomfort similar to your own. Then an anesthetic agent is injected to block the pain temporarily, with a long-acting steroid pain reliever administered if recommended by your doctor.

Patients need to come to their appointment with their typical pain and not take any pain medication after midnight the night before the injection.

Facet Joint Injections

The bone structures of the spine stiffen and lose flexibility as a part of the aging process. Vertebral joints (called facet joints) can degenerate, causing pain and nerve irritability. Steroid injections into these joints can help relieve pain.

During a facet joint injection procedure, you are first appropriately positioned and the injection area is cleansed and anesthetized. Using a fluoroscope (a type of X-ray machine) for guidance, your doctor identifies the specific area to be injected.

To confirm correct positioning of the needle, a special X-ray dye is injected, followed by a combination of an anesthetic and steroid.

Many patients feel immediate relief of pain symptoms with the anesthetic, but it can take up to three to five days for the steroid to take effect. Pain can return temporarily in one to three hours after the anesthetic wears off, but once the steroid takes effect the symptoms should subside.

Kyphoplasty

Kyphoplasty is a minimally invasive stabilizing surgery used to treat the pain associated with vertebral compression fractures. It helps restore any spinal height lost due to the vertebra collapse.

A kyphoplasty procedure helps stop the pain caused by a compression fracture by stabilizing the bone and restoring the lost vertebral body height due to the compression fracture. Many compression fractures occur due to osteoporosis.

During kyphoplasty, your surgeon places an image-guided needle into your fractured vertebra and introduces a special balloon through the needle. When inflated, the balloon restores the compressed vertebra to its normal shape and height. The balloon also compacts the soft inner bone to create a cavity inside the vertebrae.

When the vertebra is positioned correctly, the balloon is removed and the doctor uses specially designed instruments under low pressure to fill the cavity with a cement-like material called polymethylmethacrylate.
(PMMA). After being injected, the material quickly hardens, stabilizing the bone. The cement strengthens the area and helps prevent future fractures. Kyphoplasty takes about one hour for each vertebra involved.

Kyphoplasty cannot correct an existing deformation of the spine. Certain patients with osteoporosis are not candidates for this treatment. Patients with painful symptoms or spinal deformities from recent osteoporotic compression fractures are likely candidates for kyphoplasty.

**Spinal Cord Stimulators & Implants**

A spinal cord stimulator is a device implanted to stimulate nerves close to the spinal cord. The stimulation interrupts the transmission of pain impulses, reducing or eliminating pain. The system has electrical leads which are implanted in the spine and a transmitter. The transmitter looks like a heart pacemaker and is placed under the skin in the abdomen.

Under X-ray guidance, a needle is inserted close to the stimulation area. The electric current carrying leads are inserted through the needle and implanted close to the spinal cord. Most leads are implanted in the mid-section of the spine. A battery is then connected to the wires to generate the current.

Spinal cord stimulators can be helpful for patients with severe, chronic pain which cannot be relieved by other methods. Patients with Failed Back Syndrome are often good candidates for this procedure, especially if they have persistent leg pain. A temporary trial stimulator is usually placed before the permanent implantation of the system.

**Vertebroplasty**

Vertebroplasty is an outpatient procedure where a specialized medical-grade bone cement is injected through a small incision in your skin. The cement hardens and provides pain relief and stabilization to fractured vertebrae.

Vertebroplasty helps stop the pain caused by a compression fracture by stabilizing the bone and restoring the lost vertebral body height due to the compression fracture. Most compression fractures in older patients are due to osteoporosis. Vertebroplasies are usually done for older patients who would not easily undergo general anesthesia.

During the percutaneous vertebroplasty procedure, a small needle is placed into the crushed bone guided into position using special X-ray equipment. Then bone cement is injected into the bone. Several crushed bones can be treated
at the same time.

Open surgery is not needed. The procedure takes about 1 hour and is usually done using only numbing medicine.

Vertebroplasty is a very safe procedure. 75-90% of people treated with vertebroplasty in the United States have complete pain relief or significant reduction of their pain.

Vertebroplasty is recommended for patients with significant back pain caused by broken bones in their back that is not better after one to two weeks of bed rest and pain control medicine. Newer fractures respond better than older fractures, but older fractures can be treated successfully. Vertebroplasty does not help with chronic back pain or herniated discs.

**Radiofrequency Lesioning (RF)**

Radiofrequency lesioning can be helpful in patients with neck and back pain who have not responded to any other therapeutic measures such as medication, physical therapy, and selective spinal injections.

For patients who have temporary improvement with diagnostic spinal injections, radiofrequency lesioning can be an effective way to interrupt the pain signals for an extended period.

The radiofrequency lesioning procedure is similar to other spinal injections. A fluoroscope assists in pinpointing the specific area to be treated. A special radiofrequency needle is inserted next to the pain fibers in the spine. A microelectrode is inserted through the needle to begin the stimulation process. Patients are asked by their doctor for feedback to help determine if the electrode is in the best area for treatment to produce the best relief.

Once the needle and electrode placement is established, treatment begins. The radiofrequency current travels through the electrode and into the surrounding tissue, causing the tissue to heat. The heat eliminates the pain pathways. Average procedure time is 30 to 60 minutes.

Radiofrequency treatments block pain signals for prolonged periods, but the human body may regenerate the pain pathways over time. The procedure may need to be repeated. Most patients report longer lasting relief than with other spinal injections.
Intradiscal Steroid Injections

One potential cause of low back or leg pain is a problem with an intervertebral disc - the gel-filled cushions that separate your spine’s bones (vertebrae).

Intradiscal steroid injections can offer short-term pain relief in patients with pain originating from a damaged vertebral disc, particularly due to degenerative disc disease (discogenic low back pain) and endplate Modic changes (changes of the vertebral endplate related to spinal degeneration).

Intradiscal steroid injections can help identify the cause of the pain and treat it. Sometimes the specific cause of the pain cannot be identified using diagnostic imaging, such as MRIs or CT scans. Temporarily numbing the suspicious disc can help to determine the pain source.

Intradiscal steroid injections can also be therapeutic. A steroid medication is injected to decrease inflammation within a disc, relieving pain. The steroid usually starts to work two to three days after the injection, with full effect within one to two weeks. Pain relief can vary from no relief to long-term pain relief.

During the intradiscal injection procedure, the injection area is cleaned and numbed. Using fluoroscopic (X-ray) guidance, your physician determines the appropriate path for the needle. A thin needle is inserted into the center of the disc to be injected. A small amount of contrast dye is added to make sure that the medication flows exactly where intended. Then a small amount of anesthetic, steroid, or a combination of both is injected, depending on the procedure’s purpose.
Disc Biacuplasty

Disc biacuplasty is designed to reduce chronic back pain caused by the intervertebral discs. Intervertebral discs lie between adjacent back bones (vertebrae) in the spine. The discs allow slight movement of the vertebrae, help hold the vertebrae together, and function as a shock absorber for the spine.

In the procedure, heat is applied to the outer fibrous ring (annulus) of discs that separate the vertebra of the back to remove the neurons that generate pain sensations. This state-of-the-art procedure uses an innovative and highly sophisticated technologic advancement known as water-cooled radiofrequency (RF) ablation to treat painful, injured intervertebral discs. Energy is created within the target disc by special radio waves that heat the inside of the disc to block painful nerves and repair the damaged collagen.

Disc biacuplasty uses an advanced type of radiofrequency ablation (RFA) to treat painful discs from the inside. By applying the energy to the inner part of the disc, the nerve supply can be cut off from the damaged disc rendering it painless, while also repairing some of the damaged collagen within the annulus.

Disc biacuplasty uses thermal energy on a painful disc but differs from traditional radiofrequency ablation (RFA) in that it delivers bipolar RF energy via two thin electrode probes placed close together within the disc. These probes are internally cooled during the ablation procedure allowing bipolar RF energy to heat annular tissue next to and between the two electrodes, while the tissue in immediate contact with each electrode probe is actively cooled.

Disc biacuplasty can help relieve pain, reduce medication intake, and improve function, satisfaction and quality of life of patients with chronic mechanical disc-related lower back pain.
Florida Orthopaedic Institute’s surgeons are on the leading edge of research in interventional spine. Dr. Barna is treating CRPS (Complex Regional Pain Syndrome, formerly known as RSD Reflex Sympathetic Dystrophy) with paresthesia free stimulation and two new technologies; 1) high-frequency stimulation and 2) burst stimulation.