

Comprehensive Centers for Pain Management

Common Injection and Implant Procedures for the Treatment of Acute and Chronic Back Pain

There are many different treatments for back pain. Taking lots of drugs (which many people find unpleasant) or undergoing surgery are not your only options. Plenty of medical options that fall between medications and surgery may be very effective treatments for your back pain. Among those options are injections and implants, procedures that you can discuss with your doctor. Let's look at these potentially helpful therapies now.

Injections are procedures that involve using a needle to deliver a stimulus, medication or other substance directly to the source of back pain or damage. Implant therapies are those that work through a pain-relieving device placed surgically inside the body. The devices work by delivering either a medication or stimulus to the spine.

While some of these therapies have been used for decades, some are relatively new and just starting to gain acceptance. Others are controversial, with little scientific evidence to support their use.

In general, injections are used for people with chronic or acute pain that hasn't responded to other therapies. The success of injections varies and depends largely on the problem that's causing pain, the correct placement of the needle and the experience of the doctor giving the injection.

Most often, implants are used to treat people who have had back surgery, but have found that surgery didn't relieve their pain sufficiently. When back surgery to correct the cause of a person's pain doesn't provide relief, we say the person has "failed back syndrome." Implants or injections may offer these people relief for their debilitating pain.

Below are the most common non-operative treatments for back pain.

Injections

Physicians with special training and experience in interventional (injection) treatment of back pain should be your choice for injection therapy. The amount of pain people feel with injections is highly variable. Some people report moderate pain with injections; others say they experience virtually no pain at all. Even if injections do cause some pain, most people would prefer them to invasive surgery. Usually an anesthetic (pain-killing medication) is administered with the injection, helping to ease any pain associated with the procedure and in certain circumstances, sedation can be administered.

The risks associated with injections are variable, too, and include infection, bleeding, nerve damage or a puncture of the dura mater (known as a "wet tap"), the outer membrane of the spinal cord, which can cause a headache for up to a few days afterwards. Fortunately, all of these risks are rare and when they do occur, they usually are not serious or long-lasting.

Injections are safe for most people and are performed on an outpatient basis. If you have a procedure in the morning, in most cases, you'll be home that afternoon.

There are numerous types of injections. The best one for you, should you need one, will depend on your particular problem.

Epidural Steroid Injection

When inflammation within the spinal column causes nerve root irritation and swelling, doctors sometimes administer a potent anti-inflammatory medication to reduce inflammation and ease pain.

Steroids typically are injected directly into the epidural space – the area between the dura mater (the outer membrane of the spinal cord) and the vertebrae – to deliver medication directly to the site of inflammation.

Why they're used:

Epidural steroid injections have been used for almost half a century to treat sciatica (pain in the sciatic nerve, the major nerve of the leg, which runs from the lower end of the spine, behind the thigh and to the knee before dividing into smaller nerves). Your doctor may recommend an epidural steroid injection if you have acute sciatica or if ongoing pain makes it difficult to be active or do rehabilitation exercises.

How they're done:

Epidural steroids are generally administered in outpatient facilities. If you and your doctor decide that an epidural steroid injection is appropriate, you can expect the procedure to last between 5 and 15 minutes.

Your doctor will have you lie flat on your stomach on an X-ray table. Before the actual injection into the epidural space, your doctor will inject a local anesthetic (pain-killing medication, similar to one used to numb your mouth prior to having a filling) into the area. Then, typically using an X-ray procedure called fluoroscopy, he or she will guide the needle into the epidural space and inject the steroid solution. After the injection, your doctor will probably want to monitor you for 15 to 20 minutes before allowing you to go home.

Once at home, you should take it easy for the rest of the day, but you may resume normal (that is, what's normal for you) activities the following day.

Prognosis:

By delivering medication directly to the site of inflammation, epidural steroid injections may ease pain in up to 70 percent of people who have the injections. Pain relief typically occurs in seven to 10 days and may last from a week to a year. Doctors may administer as many as three injections in six months to a year's time.

Selective Nerve Root Block or Transforaminal Epidural Steroid Injection

When a nerve root is compressed or inflamed, it can cause pain in the back and leg. A selective nerve root block (SNRB) or Transforaminal Epidural Steroid injection (TF ESI) is an injection of a steroid and/or numbing agent into the area of the nerve where it exits the spinal column between the vertebrae.

Why they're done:

SNRBs can be used in diagnosis. If an injection into a particular site relieves pain, the doctor can determine the source of the pain. SNRBs and TF ESI are also used for the treatment of back and leg pain, particularly pain from a herniated disc or if a nerve is inflamed after back surgery. This technique may be more effective than epidural steroid injections in many situations.

How they're done:

Like epidural steroid injections, selective nerve root blocks are generally administered in outpatient facilities. The procedure is performed under fluoroscopy, which enables the doctor to locate the precise space to be injected. More than one injection may be given at the same time.

To have the procedure, you'll need to lie still on your stomach on an X-ray table while the doctor administers the injection. Although the injection itself will be mildly uncomfortable, if the site of pain has been correctly identified for injection, your nerve pain should start to improve quickly.

Your doctor will want to monitor you for a while before sending you home for a day's rest followed by normal, light activity.

Prognosis:

The success of the procedure lies largely on its ability to target the affected nerve root. If the nerve root injected is not the source of your pain, it will have no effect on your pain.

If SNRB or TF ESI treatment is successful, your doctor may advise having this treatment repeat as needed but not to exceed 3-6 injections in a one year period of time.

Facet Joint Block

If your doctor suspects the source of your pain is in the facet joints, where the vertebrae connect to one another, he may recommend a procedure called a facet joint block, in which a steroid and/or anesthetic medication is injected directly into the joint capsule or injected in such a manner to block the nerve(s) to the facet joint.

Why they're done:

Like SNRBs, facet joint blocks are used in diagnosis. If an injection into a particular site relieves pain, it can help the doctor determine the source of the pain. Facet joint blocks are also used as therapy for the treatment of pain resulting from injuries or from osteoarthritis affecting the facet joints, but there is little evidence of their effectiveness over the long term.

How they're done:

Like other spinal injections, facet joint blocks are performed on an outpatient basis under fluoroscopy.

To have the procedure, you'll need to lie flat on your stomach on an X-ray table while a specially trained doctor guides the needle into the facet joint suspected of causing your pain. Once the needle is in place, your doctor will inject the pain- and/or inflammation-easing medication into the facet joint capsule or to block the facet nerve. If the facet joint was indeed the source of your pain, the anesthetic should provide some relief almost immediately.

After the procedure, you will be monitored for a short while and then allowed to go home. Your doctor may recommend rest if steroid was used or may actually ask you to perform normal daily activities to "test" if the facet nerve was injected. In either case you should be able to resume light to normal activity the following day.

Prognosis:

As with selective nerve root block, the effectiveness of facet joint blocks depends largely on whether the target of the injection was the actual cause of your back pain. If the injections are effective, your doctor may recommend repeating the procedure or proceeding with Facet Neurotomy.

Facet Neurotomy or Medial Branch Nerve Radiofrequency Ablation (RFA)

Facet neurotomy or RFA is a procedure that targets the nerve supplying the injured facet joint.

Why it's done:

For people in whom facet joint block has suggested that a particular facet joint is a cause of back pain, this procedure can provide longer relief than the injection of medication alone by disabling the nerve responsible for the pain.

How it's done:

Facet neurotomy is performed much like other spinal injections, in an outpatient setting. As you lie on your stomach on an X-ray table, your doctor will insert a needle into your affected facet joint, using fluoroscopy. Instead of injecting medication, however, the needle will contain a probe, which is then heated with radio waves and applied to the sensory nerve to the back, disrupting the nerve's ability to carry pain messages to the brain.

Prognosis:

Up to 75% of those people with pain confirmed to result from problems with a facet joint find some lasting relief from facet RFA.

Sacroiliac Joint Block

Sacroiliac joint blocks are much like SNRBs and facet joint blocks, except that the anesthetic or anti-inflammatory medication is injected into the sacroiliac joint, which connects the sacrum (one of the lowest sections of the spine, composed of five fused vertebrae) to the pelvis.

Why it's done:

Like some other injections, sacroiliac joint blocks are used in diagnosis. When an injection brings pain relief, it helps confirm that the sacroiliac joint was a source of pain. Sacroiliac joint blocks are also used as therapy for low back pain that results from inflammation or damage within the sacroiliac joint. The sacroiliac joint may be responsible for acute and chronic back pain in up to 18% of back pain sufferers.

How it's done:

Like many other injections used for back pain, sacroiliac joint block is performed on an outpatient basis under fluoroscopy. As you lie on your stomach on an X-ray table, a specially trained physician inserts a needle into the sacroiliac joint and injects a numbing agent and a steroid. After the procedure, you'll be monitored for a while before being allowed to go home.

Prognosis:

For the best results, sacroiliac joint block must be followed up by physical therapy and appropriate exercise to help keep the joint moving. If pain returns following sacroiliac joint block or if pain is not reduced to levels that make rehabilitation possible, the injections may be repeated up to four times per year.

Prolotherapy

When surgery, medication and other conservative therapies have failed to bring back pain under control, some doctors recommend a procedure called *prolotherapy*. (Other names for prolotherapy are sclerotherapy, regenerative injection therapy and nonsurgical ligament reconstruction.)

Unlike injections designed to ease inflammation, the goal of prolotherapy is to cause an inflammatory response through the injection of an irritant into injured soft tissues of the back. The reasoning is that the inflammation created will increase blood flow in tissues that are slow to heal because the blood flow to them is limited. In other words, the procedure sets in motion a healing process in small tears and weakened tissues that can lead to pain relief.

Although a handful of studies show some benefits of prolotherapy and some doctors swear by it, it is not widely practiced in the United States. It is not taught currently by conventional medical schools or hospital residency programs that physicians-in-training must complete.

Prolotherapy is most commonly performed by doctors, including anesthesiologists, orthopaedic surgeons, physiatrists and neurosurgeons, who have taken training courses offered by some professional organization, such as the American Academy of Musculo-Skeletal Medicine and the American Association of Orthopaedic Medicine.

Why it's done:

Prolotherapy is used most commonly to ease back or neck pain associated with degenerative disc disease, sciatica or whiplash (damage to the ligaments, vertebrae, spinal cord or nerve roots in the cervical spine caused by a sudden jerking back of the head and neck, such as in an auto accident).

How it's done:

The procedure is done on an outpatient basis, usually in a doctor's office. The doctor injects the irritant (a dextrose, or sugar, solution) into the affected tissues. Most people require four rounds to six rounds of injections to experience results, although some need fewer and some may require as many as 10.

Prognosis:

Many patients and physicians (including former U.S. Surgeon General C. Everett Koop) report pain relief using prolotherapy. But most of the support for its use is just that – reports, not scientific studies. Further research is needed to determine its use in the treatment of back pain and to compare its effectiveness with that of other therapies.

Trigger Point Injections

The injection therapies we have discussed thus far involve injecting a medication or substance directly into the area of the spine. Trigger point injections, however, may be given throughout the muscular area of the back.

Trigger points are specific sites on the muscles that cause pain (both locally and throughout the back) when pressure is applied to them. You may have trigger points and not even be aware of them until your doctor presses on one during an exam. Trigger points are believed to occur due to excessive physical activity, fatigue or trauma.

Why they're done:

Trigger point injections, which involve injecting small amounts of a local anesthetic, sometimes along with a steroid medication, directly into painful trigger points, may be helpful for people who experience back pain when pressure is applied to certain areas.

How they're done:

Your doctor can give trigger point injections in his or her office or in an outpatient clinic. The procedure usually involves having between one injection and five injections using a fine needle. The entire procedure lasts between five and 15 minutes. Afterward, you'll be monitored for about an hour before you're allowed to go home and resume normal activity; however, you must be careful for the first few days to avoid excessive use of the injected muscles.

Prognosis:

Trigger point injections may be helpful in easing back pain for some people. Most doctors recommend using them on a short-term basis or during times when back pain is at its worst. If you decide to have trigger point injections, make sure that you do so along with other therapies –

including oral medication therapies, exercise and physical therapy – that your doctor recommends.

The Benefits and Risks of Injections

Just like medications you take by mouth, injections can carry risks with their benefits. The risks vary by the specific procedure, but may be related to the substance injected or to the act of inserting the needle into the body.

Inserting needles required for these procedures has the potential to cause problems, such as infection, bleeding or even nerve damage, although such problems are rare. A risk of epidural injections, in particular, is a puncture of the dura, which may cause some spinal fluid to leak. Although the puncture itself isn't serious, it can cause a headache that may last up to a few days. Like other side effects of injections, a dural puncture is rare.

Still, it's important to speak to your physician about the risks and benefits of any procedure you are considering and to weigh them carefully with your physician before making a treatment decision.

Implantable Pain Relief Devices

There are two basic types of implantable devices for pain relief: those that deliver electrical stimulation to the spinal cord and those that deliver medication to it.

Spinal Cord Stimulation

Since the 1960s, electricity has been used in the treatment of leg pain. Spinal cord stimulation (SCS) is believed to decrease the perception of pain by activating nerves in your lower back to block pain signals going to that area. As a result, pain is replaced with a pleasant tingling sensation.

SCS is delivered through a set of electrodes that are inserted between the vertebrae into the epidural space. A pulse generator or radio receiver surgically placed under the skin in the abdomen or the upper buttock area activates the electrodes. Newer technology which allows more stimulation options, patient control and the ability to recharge the implanted battery without surgical replacement makes this method of treatment more useful than in past years.

Why it's done:

SCS may be appropriate for people with nerve root injuries that haven't responded to conventional treatments or for people for whom surgery – sometimes multiple surgeries – to correct the cause of leg pain has not been successful. SCS is generally less useful if the only symptom is back pain. SCS is also used in certain chronic pain problems not related to the back, including nerve damage, neuropathy and a chronic pain condition called complex regional pain syndrome (previously known as RSD).

How it's done:

Implantation of an SCS device is done in at least two stages, in an ASC or hospital setting. The first step involves placing a "trial" lead or wire containing a set of electrodes into the epidural space through a catheter inserted through a small puncture in the back. For this stage of the procedure, you'll probably have a course of intravenous sedation and local anesthesia. The lead is then connected to a small electrical device, called a stimulator, which is about the size of a cellular phone.

At least initially, you'll be sent home with a temporary, external device that is programmed to give you several options for stimulation as well as some control of the stimulation intensity and frequency. If, after a few days, you decide the device doesn't help much, the device and wires

that lead to your spine can be removed without additional surgery. If you find the device helpful, on the other hand, you can opt to have it placed in your body during a second procedure.

The second stage takes about 90 minutes and is performed under local anesthetic along with I.V. sedation. Your doctor will need you to be awake to help him or her appropriately place the electrodes to provide maximum relief. After the procedure, you will be observed for a while and give instructions on how to operate the device. Most people are allowed to go home the same day of surgery.

Prognosis:

Long term, as many as 60-80 percent of people with SCS are satisfied with the level of pain relief they get from SCS; however, few experience complete pain relief. A better judge of success is most people enjoy improved level of function. Once healed, you can enjoy most activities without worry of damaging the device or hurting yourself.

Implanted Drug Infusion

Implanted drug infusion (intraspinal drug delivery or I.D.D.) is much like SCS, except that it uses medication, not electrical stimulation, to ease pain.

Intraspinal drug infusion therapy involves implanting a “pump” in the body to deliver a regular, predetermined dose of pain medication via a thin tube into the painful area of the spine. By targeting medication to the precise site of pain, the device enables you to use much smaller amounts of medication than would otherwise be necessary to control pain. Precise targeting of small doses also reduces the risk of side effects you might experience from higher oral doses of pain-relieving medication. The newer pumps also have a patient control feature that allows you to have some flexibility in the delivery of pain medication

Why it's done:

Intraspinal drug infusion therapy usually is reserved for people who have pain primarily in their lower back and buttocks that hasn't responded to more conservative treatment options. Like spinal cord stimulation, it may be appropriate for people for whom surgery – sometimes multiple surgeries – to correct the cause of back pain has not been successful. Multiple medications are available currently to infuse into the spine and more are under development. I.D.D. is also used to treat a wide variety of pain not related to the spine.

How it's done:

The procedure to implant a medication pump is much like that used for SCS. As with SCS, a trial pump that stays outside the body is used first to deliver pain medication through a tube inserted into the affected area of the spine. If you find that the pump is helpful, your doctor can permanently implant it. The permanent procedure must be performed in an operating room under local, spinal or general anesthesia. The procedure usually lasts 90 minutes.

Prognosis:

If other pain relief treatments have failed and you meet the criteria for intraspinal drug delivery therapy, this therapy may help you bring pain to a more tolerable level. Be aware that the procedure involves more than just implanting a device. It requires a commitment to continue other pain-relief therapies, such as exercise and physical therapy as well as lifestyle modifications.

It also requires a commitment for regular doctor visits to keep the pump delivering its medication. At least once every few months, you'll have to have your pump refilled with medication. The simple procedure involves injecting medication through your skin into the pump's reservoir.

The Benefits and Risks of Implanted Devices

Like all medical treatments, implanted devices carry some risks. Fortunately, in most cases, these risks are minor, and include possible infection of the injection site and, in the case of drug infusion, drug side effects.

A Treatment of (Almost) Last Resort

Because placing implantable devices requires surgery and doesn't actually correct the problem causing the pain, doctors don't recommend them for anyone who hasn't exhausted more conservative treatments, including, in many cases, conventional surgery to correct the problem. Other factors that will influence your doctor's decision to prescribe implantable devices include the following:

- Your symptoms. If the symptoms you're experiencing aren't consistent with the results of diagnostic tests, there may be factors at play in your pain that an implanted device won't relieve. In those cases, continuing to look for the source of the pain, rather than mask the pain with an electronic device, might be a wiser choice.
- The role of emotions in your pain. If your doctor suspects that your pain may be largely influenced by depression or anxiety, an implanted device probably won't help much. In fact, your insurance company may require that you have a psychological evaluation before agreeing to cover the implantation of a device. In this case, you might need to explore stress-relief techniques or even medications that may help you control your anxiety or depression.
- Your willingness to continue other therapies. Implanted devices work best in conjunction with conservative therapies. Back pain always requires treatment integrating exercise, healthy lifestyle habits, rest, stress reduction and other strategies. If you aren't willing to try or to continue these other components of therapy, you probably aren't the best candidate for an implanted device.

Nevertheless, if you meet the criteria outlined in the descriptions of the specific therapies, and if you are committed to continuing exercise, physical therapy and other pain-relief therapies while using the implanted devices, implantable devices may be just what you need to get your pain under control.

- Adapted from Mary Anne Dunkin