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# Epidural Steroid Injections

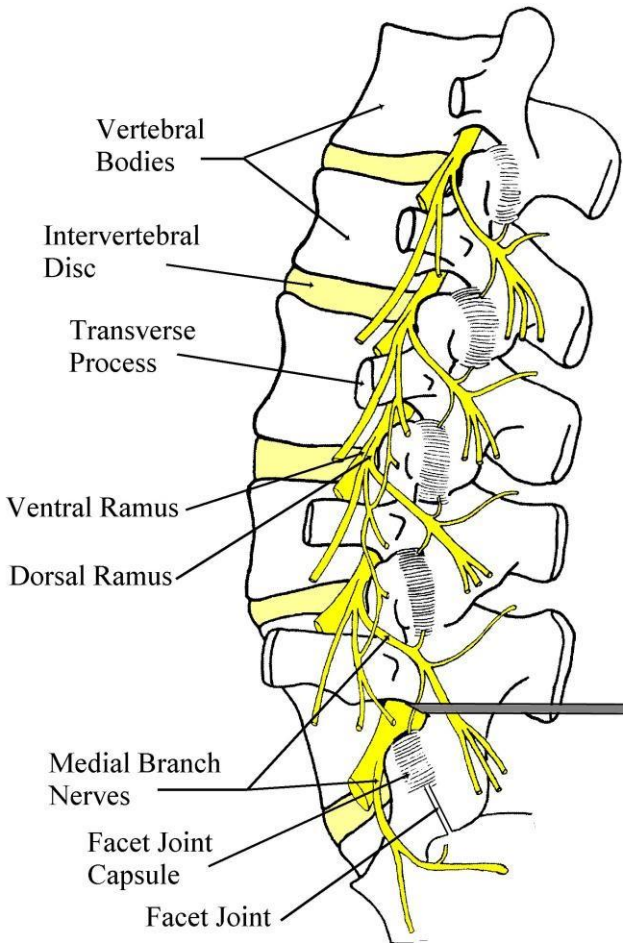
## Background

The spinal cord runs within the bony structure of the spine and is encased by three membranous sacs: the dura mater, the arachnoid mater, and the pia mater. The pia mater is adherent to the brain and spinal cord. The dura mater and arachnoid mater are adherent to each other, and together are often referred to more simply as the **dura**. The **epidural** space is between the outer surface of the dura and the bones of the spine; it completely surrounds the dura but does not contain any fluid. Instead, it is filled with epidural fat and a large network of blood vessels.

Nerves from the upper and lower limbs (including the nerves that make up the sciatic nerve) enter the vertebral column and pierce the dural sac to reach the spinal cord. For various reasons (most commonly disc injuries) these nerves can become irritated as they enter the vertebral column and cause pain in the lower limbs. This pain is felt as shooting down the lower limb and is referred to as nerve root pain or, technically, *radicular pain* (from the Latin *radix*, a root). The common name for this sort of pain in the low back and leg is *sciatica*.

The term, 'epidural steroid injection' refers to the injection of corticosteroids into the epidural space of the vertebral column as a means of treating pain caused by irritation of the spinal nerves.

**Transforaminal Epidural Steroid Injection**




## How does an epidural steroid injection work?

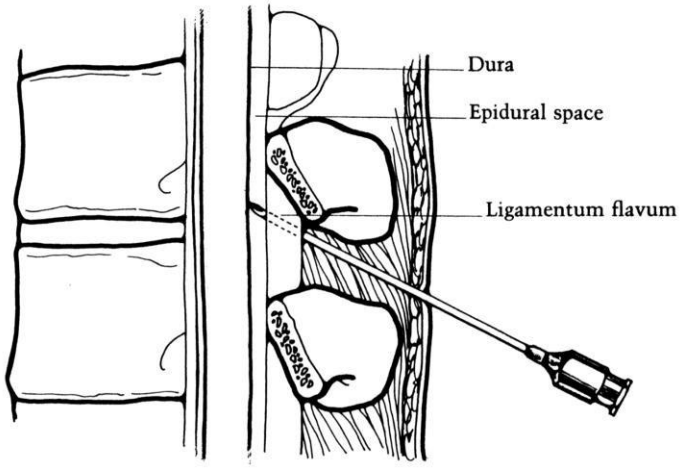
The primary way in which an epidural steroid injection works, is by reducing inflammation. Inflammation around nerve roots causes nerve injury and pain. Corticosteroids are potent anti-inflammatories and placing this medication around the injured nerve can help stop nerve injury and improve pain.

The type of steroid that that is typically used for these injections is a “depo” steroid meaning that there is some particulate in the medication to allow it to settle in the location it was deposited in, allowing it to work for a long period of time. We frequently use steroids that will work for a period of months, during which time the body’s healing will absorb herniated disc material and frequently pain won’t return.

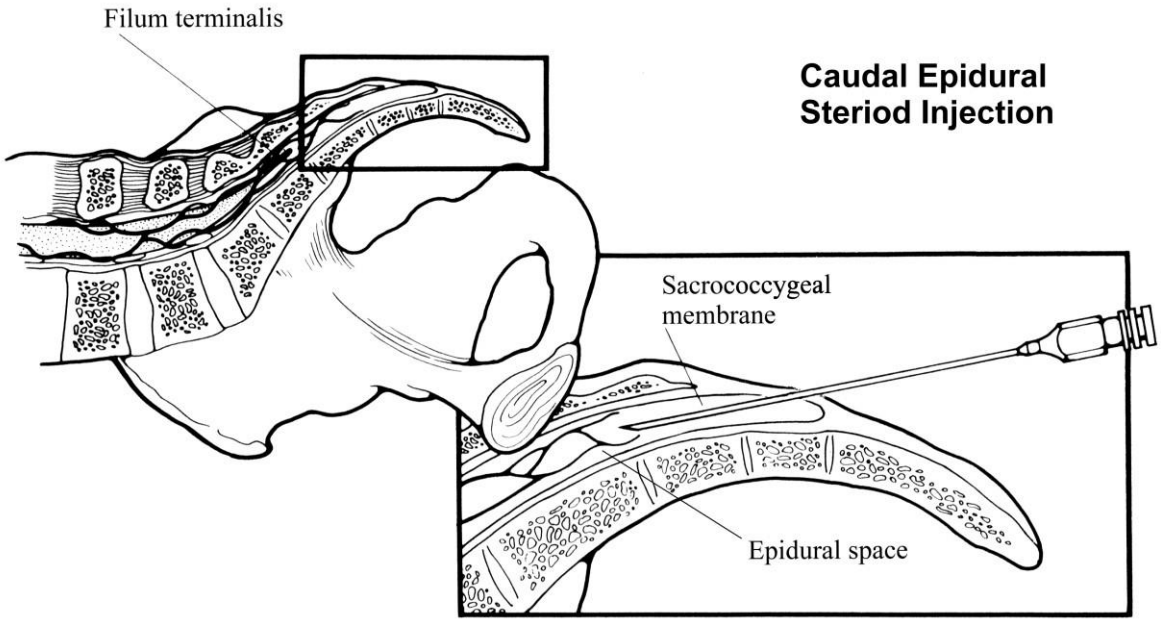
The chief effect of an epidural steroid injection is to reduce pain, though it can result in return of sensation and strength in an affected limb. Pain relief from epidural injections, in conjunction with therapy has been proven to provide long-lasting relief of back and leg pain. On occasion patients will get relief for only a few weeks or months, and in those cases the doctor may opt to repeat the procedure. Some patients do not experience any pain relief and may in fact suffer an increase in pain and/or other symptoms as detailed later.

## How is an epidural steroid injection administered?

Certain medications may increase the risk of complications. **If you are taking aspirin you should stop it 5 days prior to the procedure**. If you are on Coumadin (warfarin), heparin, Lovenox (enoxoparin), Ticlid (ticlopidine), Plavix (clopidogrel), or other blood thinning agents such as anti-inflammatory agents, please let your physician know at least one week prior to the procedure. You can continue to use Celebrex (celecoxib) before the procedure. Do not take your regular *pain* medications for six hours before or after the procedure. You should continue to take your routine medications (such as high blood pressure and diabetes medications) before the procedure. If you are on antibiotics please notify your physician, he may wait to do the procedure. **If you have an active infection or fever we will not do the procedure.**




You should not eat or drink anything (except your routine medications) if you are getting IV sedation six hours prior to the procedure; this again, lowers the chance of having complications. You are expected to have a ride to and from the procedure unless told otherwise by your physician. The procedure usually takes about 15 minutes though you may be at the facility for as long as 45 minutes. Once you arrive to the facility, a nurse will place an IV in your arm. After this has been done and the doctor is ready, you will be taken to the room and positioned on the table. The physician may do the procedure through an opening on the side of the spine where a nerve root comes out (transforaminal approach), through the middle of the neck or back (intralaminar approach), or through a small opening in the sacrum, near the tailbone (caudal approach). Local anesthetic will be injected into the skin and underlying tissues to decrease the discomfort of introducing the epidural needle.




Once the local anesthetic is working the epidural needle is advanced into the epidural space using the bones as landmarks. Your physician will use fluoroscopy (a live x-ray) and other technical aids to ensure that the needle is in the right place.

When the needle is in the epidural space, a syringe containing the corticosteroid solution is connected to the needle. After making sure that the needle is not in a blood vessel or in the spinal fluid, the doctor injects the solution slowly. The doctor will ask you to describe how you are feeling while the solution is being injected.

You may briefly feel pins and needles in the arms or legs (depending on the site of injection). You may get a headache. If the needle touches a bone you will feel a sharp local pain. You should tell your doctor about these feelings.

The corticosteroid will be injected with a local anesthetic, however, the dosage and the volume of the steroid and the other components will vary according to the doctor's judgment.
Following the injection, you will remain at the facility for a few minutes to recover. While recovering, you will be monitored for any adverse reactions to the procedure. Once you are feeling well enough to walk, you will be allowed to leave with your ride. You are expected to call or follow-up with your physician in 5-7 days to let him know how you are feeling. This will help him determine whether or not to perform another injection.

## What are the risks of an epidural steroid injection?

With any operation or injection procedure there are risks. In the case of epidural steroid injections these risks are small, most occurring well under one percent of the time.
There are a variety of side-effects and complications, most of which relate not to the steroid itself, but to the way the injection is given.

The most common side-effect is a temporary increase in pain. It occurs in about one per cent of epidural steroid injections and appears to be related to the volume of substance injected into the epidural space.
Headache, another complication with an incidence of one per cent, can be normal and related to the volume of fluid injected into the epidural space or may be related to the accidental puncture of the innermost membrane which surrounds the spinal cord. The headache is caused either by a leakage of the fluid surrounding the spine, or as a result of an accidental injection of air into the spinal fluid. In most cases the headache subsides within a few hours but sometimes it can persist for days, rarely for longer. In such cases, it may be necessary to repeat the epidural procedure, this time injecting some of the patient's own blood, taken from a vein in the arm, which forms a small clot allowing any punctures of the membranes surrounding the nerve roots to heal.

If you are allergic to one of the additives in the steroid solution you may experience a hot flush or develop a rash. However, this should get better within a few hours or days.
As with any injection through the skin, it is possible for bacteria to gain entry causing an infection. The risk of this with an epidural injection is very small.

It is also theoretically possible that a nerve could be damaged. In the procedure, the needle is inserted very slowly, and if the lining around the nerve were touched there would be pain in the arm or leg. The doctor would then change the position of the needle slightly to avoid any risk of damage to the nerve.
The most ominous reports of complications are associated with epidural steroid injections in the neck. There have been reports of spinal cord injuries, strokes and deaths (all of these are very, very rare) which occurred when the physician injected the medication into the wrong area. Once again, your physician will use fluoroscopy and other technical aides to absolutely minimize the risk of this.

Some side-effects may occur as a result of the corticosteroid administered. If you have diabetes, you may notice that your blood sugars are elevated for 2-3 days following the procedure. If your blood sugar becomes elevated, usually only monitoring is required. However, if you are concerned, call your physician. Corticosteroids may also cause fluid retention, weight gain, alterations in skin pigmentation at the site of injection, fluid and electrolyte alterations and/or gastrointestinal upset. These side-effects are usually not serious.

Certain other side-effects may occur if the wrong amounts of local anesthetic or corticosteroid are injected into the epidural space or if the drugs are accidentally injected into the spinal fluid. These side-effects are extremely rare if the procedure is properly performed. These side-effects include:

- fluid retention
- difficulty breathing
- swelling of the face or other parts of the body
- high blood pressure
- irritation or damage to the nerves in the area of the injection

## Repetitions

If you receive some relief from the epidural steroid injection but still have symptoms, the physician may decide to repeat the injection again in the next one to three weeks. You are unlikely to benefit from a repeat epidural steroid injection if the first does not offer relief. It is unreasonable ever to undergo more

than 2-3 injections if none has provided any relief. Even if epidural steroid injections provide relief, only in exceptional cases would more than three injections be justified within a three month period.

If you are getting relief from your injections but the relief is not permanent, your physician may opt to perform another injection after the effects of the previous injection have worn off. It is unclear how many injections in the epidural space is too many. Some physicians limit the number of injections to four per year, others on occasion have performed as many as twenty injections in a year without problems. The number of injections which is safe for you to have should be discussed with your physician.

IF YOU HAVE ANY QUESTIONS ABOUT THE PROCEDURE OR ANY OF THE INFORMATION YOU HAVE JUST READ, PLEASE ASK THE STAFF OR YOUR DOCTOR. THEY WILL BE MORE THAN HAPPY TO ANSWER ANY QUESTIONS YOU MAY HAVE.