

# X-Ray-Guided Pain Procedures

This guide serves as a communication tool for patients, physicians, and nurses. It is designed to inform you, so you know what to expect and what you need to do every step of the way. Remember that this is just a guide: Your doctor or nurse may add to or change many of the suggestions. Always use their recommendations first. Ask questions if you are unsure about any information provided to you.

**Please keep this guide to reference now and for any future procedures.**

All outpatient pain-management procedures and injections described in this guide are performed in a procedure room, using sterile technique, under fluoroscopic guidance (a type of X-ray) at Adventist Health Sonora Physical Medicine.

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# One to two weeks before your procedure

## Medications to stop before your procedure

Please review this information carefully.

- ✓ NO antibiotics! Notify your physician's office immediately if you have been prescribed antibiotics in the weeks leading up to your procedure.
- ✓ DO NOT take pain medications if you are having a diagnostic block, including:
  - Medial branch block
  - Genicular branch block
  - Femoral and obturator branch block
  - Suprascapular, axillary or lateral pectoral branch block
- ✓ Certain pain medications are okay to take if you are NOT having a diagnostic block or if you are taking certain pain medications for chronic conditions in other areas than the one being tested.
- ✓ Ensure that you take all other medications, especially blood pressure medications, at usual intervals.

Examples of what medications to discontinue taking and how long to hold your medications are listed below.

- ✓ **Check these medication lists two weeks and again one week prior to your procedure.**
- ✓ **If you are unsure whether to stop a medication or not, please contact your physician's office.**

**Deviation from this protocol may result in cancellation of your procedure.**

## Anticoagulants (blood-thinning medications)

If you are taking any of the blood-thinning medications listed in the table on the next page, please follow these instructions.

### ☐ **Step 1: Obtain a signed release.**

You will need a signed release from the provider who prescribes your blood-thinning medication(s) permitting you to stop taking the medication(s).

### ☐ **Step 2: Stop taking the medication(s).**

Stop taking your blood-thinning medication(s) one to 14 days before your procedure, according to the table below.

### ❑ Step 3: Restart the medication(s).

After your procedure, restart your blood-thinning medication(s) according to the table below.

| Generic Drug                                                                  | Trade Name                                                                         | When should I STOP my medication BEFORE my injection? | When should I RESTART my medication AFTER my injection?    |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------|
| Anagrelide                                                                    | Agrylin                                                                            | 24 hours                                              | 24 hours                                                   |
| Apixaban                                                                      | Eliquis                                                                            | 3 days                                                | 24 hours                                                   |
| Aspirin                                                                       | Aspirin                                                                            | 7 days                                                | 24 hours                                                   |
| Aspirin & Dipyridamole                                                        | Aggrenox                                                                           | 7 days                                                | 24 hours                                                   |
| Cilostazol                                                                    | Pletal                                                                             | 2 days                                                | 24 hours                                                   |
| Clopidogrel                                                                   | Plavix                                                                             | 7 days                                                | 24 hours                                                   |
| Dabigatran                                                                    | Pradaxa                                                                            | 4 days<br>*6 days (impaired renal function)           | 24 hours                                                   |
| Dalteparin                                                                    | Fragmin                                                                            | 24 hours                                              | 24 hours                                                   |
| Dipyridamole                                                                  | Persantine                                                                         | 2 days                                                | 24 hours                                                   |
| Edoxaban                                                                      | Savaysa                                                                            | 3 days                                                | 24 hours                                                   |
| Enoxaparin or other low molecular weight heparins                             | Lovenox                                                                            | Call Clinic to verify hold time                       | Call Clinic to verify hold time                            |
| Fondaparinux                                                                  | Arixtra                                                                            | 4 days                                                | 24 hours                                                   |
| Norgesic Forte                                                                | Norgesic Forte                                                                     | 7 days                                                | 24 hours                                                   |
| Pentosan                                                                      | Elmiron                                                                            | 7 days                                                | 24 hours                                                   |
| Prasugrel                                                                     | Effient                                                                            | 10 days                                               | 24 hours                                                   |
| Rivaroxaban                                                                   | Xarelto                                                                            | 3 days                                                | 24 hours                                                   |
| Ticagrelor                                                                    | Brilinta                                                                           | 5 days                                                | 24 hours                                                   |
| Ticlopidine                                                                   | Ticlid                                                                             | 14 days                                               | 24 hours                                                   |
| Warfarin – we will check your INR 1-2 days prior to your scheduled procedure. | Coumadin – If your INR is more than 1.2, your procedure may need to be rescheduled | Call Coumadin Clinic to verify hold time.             | Call Coumadin Clinic to verify when to restart medication. |

# Non-steroidal anti-inflammatory drugs (NSAIDs) and dietary supplements

If you are taking any of the NSAIDs or dietary supplements listed in the table below, stop taking these for three to seven days before your procedure, as indicated. These can be restarted immediately after your procedure.

| 7 days<br>before your procedure,<br>stop taking:                                                                                                                                                                                                                                                                              | 5 days<br>before your procedure, stop<br>taking:                                                                   | 3 days<br>before your procedure, stop<br>taking:                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dietary supplements: <ul style="list-style-type: none"> <li>• Alpha lipoic acid or oils (fish oil, flaxseed oil, etc.)</li> <li>• Danshen</li> <li>• Dong quai</li> <li>• Garlic</li> <li>• Ginkgo biloba</li> <li>• Ginseng</li> <li>• Turmeric</li> <li>• Vitamin E</li> </ul> Disalcid (salsalate)<br>Relafen (nabumetone) | <ul style="list-style-type: none"> <li>• Aleve, Naprosyn (naproxen sodium)</li> <li>• Mobic (meloxicam)</li> </ul> | <ul style="list-style-type: none"> <li>• Advil, Motrin (Ibuprofen)</li> <li>• Azulfidine (sulfasalazine)</li> <li>• Arthrotec (diclofenac sodium/misoprostol)</li> <li>• Celebrex (Celecoxib)</li> <li>• Clinoril (Sulindac)</li> <li>• Indocin (indomethacin)</li> <li>• Lodine (etodolac)</li> <li>• Oruvail (ketoprofen)</li> <li>• Toradol (ketorolac)</li> <li>• Trilisate low-dose (trisalicylate)</li> <li>• Vicoprofen (hydrocodone and ibuprofen)</li> <li>• Voltaren, Zorvolex (diclofenac)</li> </ul> |

# The day before and the day of surgery

## Prior to your procedure

- A preadmission screening nurse will call you at home prior to your procedure date to review arrival times and answer questions. Your arrival time may change from when you were originally scheduled.
  - ✓ The nurse will go over your medication list, the medications you are allowed to take the day of your procedure and the medications you are NOT to take.
  - ✓ Special instructions are provided for patients taking oral medication or insulin for diabetes.
    - Advise the nurse if you are allergic to iodine, contrast dye or any medications.
    - If you have a pacemaker, AICD or spinal cord stimulator, please have the device information available for the nurse who will be calling you. If you are having a radiofrequency ablation, a magnet will be placed over the device during the procedure. If you have a SCS, please turn the device off with your remote prior to the procedure.
    - If you have been prescribed an antibiotic since scheduling your procedure, please let your physician's office know about it as soon as possible prior to your procedure day.
    - If you have received or are scheduled/planning to receive a vaccine within two weeks of your procedure, please let your physician's office know as soon as possible. Any procedure involving steroids will not be performed within two weeks before or after a vaccine.
- A patient representative will call you from Adventist Health Sonora Physical Medicine to verify your insurance and help you with cost estimates.

## What and when to eat and drink

- Nothing to eat for six hours prior to the procedure
- Nothing to drink, including water, for two hours prior to the procedure

## The day of your procedure

- **YOU MUST HAVE SOMEONE DRIVE YOU HOME.**
- You may take prescribed medications with a sip of water the morning of surgery, as directed by the pre-op nurse.

- Things to bring to pre-registration if a preadmission nurse doesn't speak to you prior to your arrival:
  - ✓ Health history
  - ✓ List of medications
- Please leave all jewelry and valuables at home.
- Arrive 45 minutes prior to your procedure.
- For spinal cord stimulator trial, please arrive one hour before your procedure.

### Pre-op area

- You will be asked to undress and wear a patient gown. You will place personal items in a patient belongings bag. The bag will remain with you on the gurney.
- IV access may be placed for the administration of medications during your procedure.
- When the procedure team has prepared your room, you will be taken via gurney to the procedure room.
- You may receive light sedation to help you relax, if you desire. The sedation may make you drowsy, but you will NOT be asleep for your procedure.
- You may feel some discomfort, but we will make every effort to minimize any pain.

### Operating/procedure room

A nurse will take you to the operating room on a gurney. You will be assisted in moving onto the operating-room bed. Special care will be taken to respect your privacy and make you comfortable with special padding and warm blankets. Depending on your procedure, you will be placed on your stomach, back or side.

You can expect the staff to:

- Place EKG and oxygen monitors
- Administer sedation, if desired or necessary, to complete the procedure safely
- Clean the procedure area with skin antiseptic
- Anesthetize the skin with lidocaine
- Complete the procedure
- Clean the skin and apply adhesive bandages
- Help you return to the gurney and take you to the recovery room

### Recovery room

- You will spend anywhere from 15 – 30 minutes in the recovery room.
- The condition and sensation in your legs or arms will be checked, depending on the procedure.
- Discharge instructions will be discussed with you and the person driving you home.
- If you are having a diagnostic block, you will need to complete a pain diary. The recovery nurse will go over how to complete the pain diary with you.

# What to expect after your procedure

## When to call your doctor

### **Call your doctor if you experience any of the following:**

- Any of these signs or symptoms of infection:
  - A fever over 101 degrees, chills
  - Redness, swelling or pain around your injection site
  - Warmth coming from your injection site
  - Pus or a bad smell coming from your injection site
- Severe headaches
- Weakness in your arms or legs

### **Get help right away if you:**

- Have severe pain at the injection site that is not relieved by medicines.
- Develop a severe headache or a stiff neck.
- Become sensitive to light.
- Have any new numbness or weakness in your legs or arms.
- Lose control of your bladder or bowel movements.
- Have trouble breathing.
- Have severe, sudden or lasting nausea or vomiting.

## After your procedure

- Follow the discharge instructions pertaining to your procedure.
- Take it easy the day of your procedure and note that everyone heals at different rates.
- If you had a diagnostic block, the surgery scheduler will review the results of the block with you. Depending on the results and the procedure, you may need to schedule a confirmatory block, radiofrequency ablation or reevaluation in the clinic.

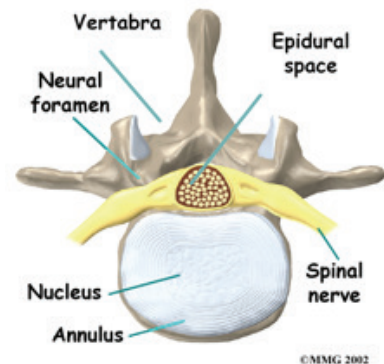
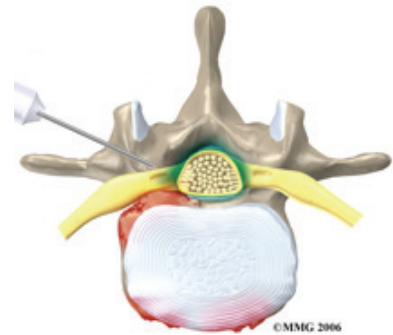
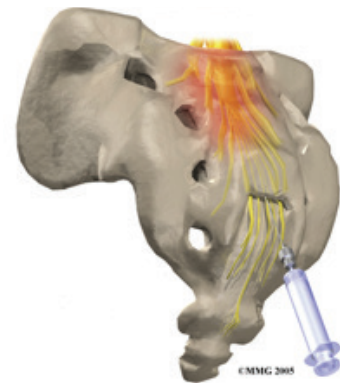
With your pain reduced, you can get back to enjoying life again. In some cases, the epidural steroid injection may not relieve all pain. You may need more injections in the same place or in another area, or you may need another type of treatment. Your physician can discuss this with you.

# Possible risks or complications

- Localized numbness and/or weakness for up to six hours
- Fainting from a drop in blood pressure. (Approximately 1% of patients will faint for a few seconds after the needle is inserted.)
- Increased pain for up to seven days until the steroid begins to work
- Effects from the steroid injection (lasting for days to a few weeks at most) such as skin discoloration or thinning, facial flushing, fluid retention, stomach irritation, mood changes, headaches, rapid heart rate or increased blood pressure, increased blood sugar, hormonal changes (including a possible increase in menstrual bleeding, spotting between periods, or menstrual cycle in post-menopausal patients)
- Steroids can also temporarily inhibit the body's ability to fight infection.
- In epidurals, rare complications include puncture of the dural sac containing the spinal fluid, which can cause a spinal headache and may require another injection, called a blood patch, to repair.
- The rarest complications include needle injury to the nerves, spinal cord, bone or blood vessels, in some cases causing total or temporary paralysis.
- Particulates from steroids, injected into a vessel, could cause strokes.
- An unpredictable allergic reaction to the local anesthetic, steroid or contrast, in some rare cases, could be severe enough to cause death.
- Radiofrequency ablation patients may have the very rare additional complications of damage to the larger nerve root into the leg or arm, which could cause partial paralysis and/or numbness.
  - If you are undergoing cervical radiofrequency ablation you may experience numbness in your neck or in the back of your head.
- If you have a pacemaker or a defibrillator, we will use an external magnet to ensure your device stays in the neutral mode. Should this fail, the radiofrequency could interfere with the device, causing irregular heartbeat which, if severe, can result in death.
- If you are taking blood-thinning medications for a medical condition, pausing these medications may put you at risk. You should discuss the risk versus benefit of stopping these medications with the provider managing your medical condition and prescribing the blood-thinning medication.

# Epidural steroid injection

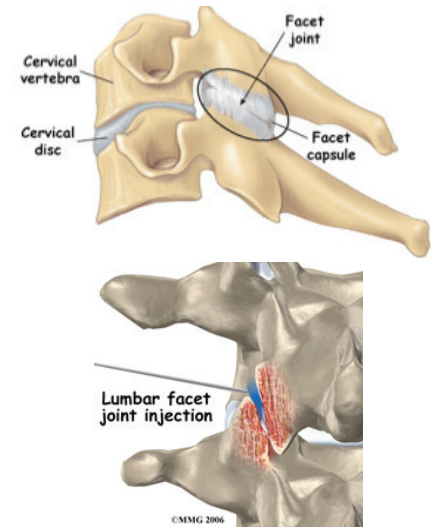
The dura is a covering that protects the brain, spinal cord, and nerve roots that exit the spine and supply muscles throughout the body, including your arms and legs. The epidural space surrounds the dura and provides access to the spinal canal or nerve roots that are irritated and inflamed by damaged discs or arthritis in your spine. Inflammation of these nerve roots or spinal canal can cause pain, cramping, numbness or weakness in the distribution of the nerve(s) involved. An epidural steroid injection can be placed in the neck, upper back, lower back or sacral region. A combination of steroids (a powerful anti-inflammatory) and an anesthetic pain medication is injected into the epidural space to decrease inflammation of the nerve roots. Sometimes, a saline solution is also added to the mixture to increase volume and cover more area. After the inflammation has subsided, a physical therapist may be better able to treat the affected area for long-term results.



# Facet joint injection

The spine is made up of bones called vertebrae. The vertebral body is a round or oval-shaped bone in the front of the spine that is connected to the level above and below by discs. The facets are small joints in the back of the spine that connect to the levels above and below. There are two facet joints per level, which provide stability and guide the motion throughout the spine. Pain can occur from the facet joints when they get inflamed from injury, such as whiplash, or arthritis from years of wear and tear. Pain from the facet joints in the neck can present as headaches, neck or shoulder pain, or pain between the shoulder blades. Pain from the facet joints in the lower back can present as low back, buttock or hip pain.

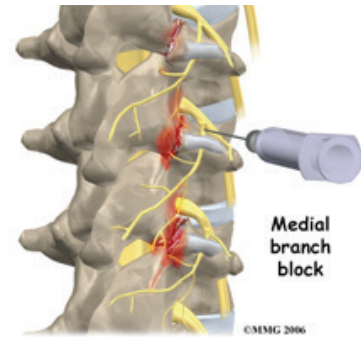
An injection into the joint itself is called a facet joint injection. During a facet joint injection, a small amount of steroid and an anesthetic are injected into the joint to reduce the inflammation and relieve pain. Pain relief usually lasts for weeks to months, giving the patient a window of time to stretch and strengthen the muscles surrounding the spine, leading to longer-term pain relief and improved function. A joint that is arthritic will not benefit long-term from steroid injections into the joint.



# Medial branch block

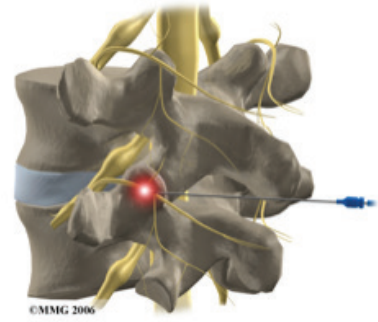
The medial branch nerves are specific nerves that supply the brain with pain information from the facet joints. A medial branch block places an anesthetic medication outside the joint right where the medial branch nerves lie, blocking these nerves from sending pain signals to the brain. If the patient gets immediate and significant relief from their usual pain, it implies that the joints targeted are a major source of their neck/upper-back or low-back pain. The pain relief from this procedure is only temporary and will return once the anesthetic wears off. A series of medial branch blocks (diagnostic and confirmatory) is used to prove that those specific facet joints are the cause of pain.

Together with radiofrequency ablation, a similar but more permanent procedure, medial branch blocks can lead to resolution of pain from facet joints for months to years.



# Radiofrequency ablation

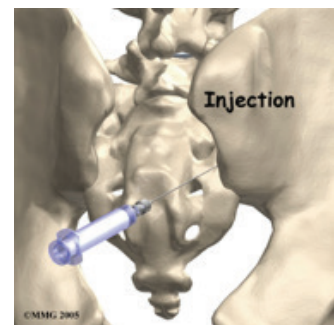
Radiofrequency ablation, or neurotomy, is an injection procedure that uses high-energy radio waves to heat and destroy nerves that bring pain information from arthritic joints. These procedures are performed very similarly to the diagnostic blocks for the spine, knee, hip or shoulder: Needles are guided under x-ray guidance to the same nerves that bring pain information from the painful joints. However, instead of an anesthetic, a very thin probe is threaded into the needle and connected to a generator that produces radiofrequency energy. A motor-stimulation test is performed to make sure there are no motor nerves nearby that must be protected. Following the test, the area is flooded with an anesthetic so that the patient does not actually feel the “burn.” The generator is then turned on to heat and destroy nerves that bring pain information from arthritic facet joints in the spine or the major joints.



# Sacroiliac joint injection

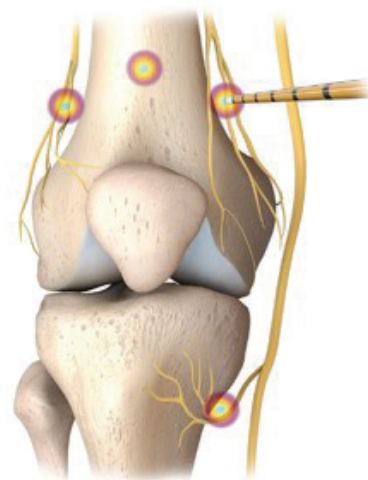
The sacroiliac joint is a large joint in the pelvis which connects your spine to your pelvis. It is a joint commonly affected by arthritis and degeneration over time, or because of trauma. If the joint loses too much cartilage due to degeneration or becomes unstable because of injury or trauma, it can become inflamed. This is especially true in patients with low-back fusions because the fusion in the spine often causes more forces into the sacroiliac joint, causing it to degenerate at an accelerated rate.

Pain from the sacroiliac joint often manifests as pain in the very low back or upper buttock — usually in a band-like fashion across the low back — and may radiate into the legs as well. There are no definitive tests or imaging such as X-rays to diagnose sacroiliac joint pain. A sacroiliac joint injection is the best diagnostic tool to confirm pain from the sacroiliac joints. A steroid is mixed with an anesthetic and injected into the joint to calm the inflammation and reduce pain. The injection is often combined with physical therapy to strengthen the muscles that support the joint. A sacroiliac joint belt can be used to stabilize the joint during aggravating activities until the muscles are strong enough to do this on their own. Because the joint is very deep and angled, it is injected under fluoroscopic guidance to ensure proper placement.



# Genicular branch block

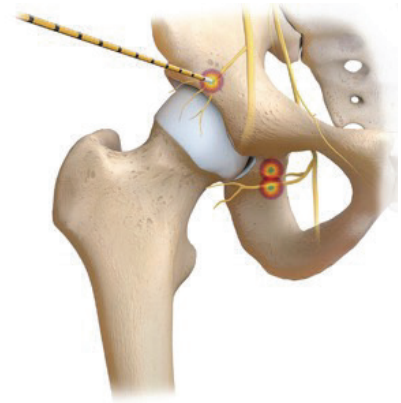
Genicular branches are nerves that branch out around the knee joint and transmit pain signals. Patients with moderate to severe knee arthritis that is not responding to physical therapy, steroid injections or viscosupplementation are good candidates for radiofrequency ablation of the genicular nerves that supply the knee joint. Other patients who would benefit from this procedure include those who are not good candidates for invasive surgery or those who, despite flawless surgery, have persistent pain. Like the medial branch blocks for the spine, a genicular block is a procedure performed with a local anesthetic to block the sensory nerves that bring pain signals from the knee to the brain. This diagnostic injection is done to determine whether the source of knee pain is osteoarthritis and to confirm that the radiofrequency ablation procedure will have an impact on the pain. If the nerve block works, the pain will be significantly relieved for a few hours during the duration of the anesthetic. A pain diary will be provided to record the amount and extent of pain relief during that time.



# Femoral and obturator articular branch block

The femoral and obturator articular branches are the nerves around the hip joint that transmit pain from it. Patients with moderate to severe hip arthritis that is not responding to physical therapy or steroid injections are good candidates for radiofrequency ablation to the femoral and obturator articular branch nerves that supply the hip joint. Other patients who would benefit from this procedure include those whose hip joint is unusually shaped and causes impingement (femoral acetabular impingement), patients with osteonecrosis (avascular necrosis) of the hip, those who are not good candidates for invasive surgery or those who, despite flawless surgery, have persistent pain.

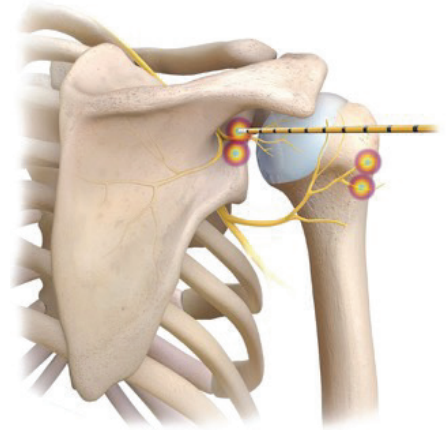
Like the medial branch blocks for the spine and genicular branch blocks for the knee, a femoral and obturator branch block is a procedure performed with a local anesthetic to block the sensory nerves that bring pain signals from the hip to the brain. This diagnostic injection is performed to determine whether the source of hip pain is due to osteoarthritis and to confirm that the pain will respond to the radiofrequency ablation procedure. The procedure is a technically challenging one because of major nerves and blood vessels that lie close to the target site. An ultrasound machine is used in addition to special X-rays to guide the needles to the right spot. If the nerve block works, the pain will be significantly relieved for a few hours during the duration of the anesthetic. A pain diary will be provided to record the amount and extent of pain relief during that time.



# Suprascapular, axillary, and lateral pectoral branch blocks

Several nerves bring pain information from the shoulder joint to the brain: the suprascapular, axillary, and lateral pectoral branches. Patients with moderate to severe shoulder arthritis that are not responding to physical therapy and steroid injections may be good candidates for radiofrequency ablation to the suprascapular, axillary, and lateral pectoral branch nerves that supply the shoulder joint. Other patients who would benefit from this procedure include those who are not good candidates for invasive surgery or those who, despite flawless surgery, have persistent pain.

Like the other diagnostic blocks for the spine, knee or hip, a suprascapular, axillary, and pectoral branch block is performed with a local anesthetic to block the sensory nerves that bring pain signals from the shoulder to the brain. This diagnostic injection is done to determine whether the shoulder pain is due to osteoarthritis and confirm that the pain will respond to the radiofrequency ablation procedure. If the nerve block works, the pain will be significantly relieved for a few hours during the duration of the anesthetic. A pain diary will be provided to record the amount and extent of pain relief during that time.



# Glossary

## Words you may hear during your procedure

### Ablation

A heat lesion created on certain nerves with the goal of interrupting the pain signals to the brain and eliminating pain

### Contrast dye

A type of medical contrast medium used to improve the visibility of internal bodily structures in X-ray-based imaging techniques such as fluoroscopy. Radiocontrast agents are typically iodine-based for pain procedures.

### Epidural steroid injection

A technique for relieving pain from spinal stenosis and spinal disc herniation. Using a needle, a steroid and local anesthetic are injected into the epidural space around the spinal cord and spinal nerves. The anti-inflammatory effect of the steroid can relieve pain caused by inflammation of the roots of the nerves branching out from the spine.

### Fluoroscopy

An imaging technique that uses X-rays to obtain real-time moving images of the internal structures of a patient through the use of an X-ray machine

### Local anesthetic

A local anesthetic that is used to numb the surface of a body part and whose effect is only temporary and will wear off

### Nerve block

Any deliberate interruption of signals traveling along a nerve, often for the purpose of pain relief. This is a short-term block, usually lasting hours or days, involving the injection of an anesthetic near a nerve. This is used as a “test” for a later procedure called a radiofrequency neurotomy ablation.

### Pain scale

Pain intensity is measured using self-reported pain scales. We will ask you to rate your pain level from 0, meaning NO pain, to 10, which is the worst pain a patient has experienced. The scale is used to determine the effectiveness of a drug or procedure.

## Spinal headache

A side-effect of spinal anesthesia and lumbar puncture that can occasionally occur in epidural anesthesia. Leakage of cerebrospinal fluid through the dura mater puncture causes reduced fluid levels in the brain and spinal cord, and may lead to the development of spinal headache hours or days later. It is intensified by movement, sitting or standing and relieved to some degree by lying down. Occurrence of this side-effect has been significantly decreased since the use of fluoroscopy for epidural procedures has become standard and enabled direct visualization of the structures during the procedure.

## Steroid

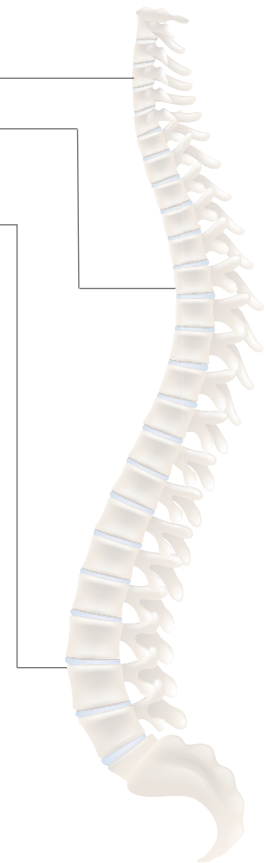
An anti-inflammatory drug given to decrease inflammation, swelling and pain

## Spine regions

**Cervical:** relating to the neck area of the spine

**Thoracic:** relating to the part of the body between the neck and the abdomen

**Lumbar:** the abdominal segment of the torso. The lumbar region is sometimes referred to as the lower spine.



## Notes

