



Discography (Discogram)

Discography uses imaging guidance to direct an injection of contrast material into the center of one or more spinal discs to help identify the source of back pain. It also is used to help guide the treatment of abnormal intervertebral discs – sponge-like cushions located between the vertebrae of the spine.

Your doctor will instruct you on how to prepare, including any changes to your medication schedule. Tell your doctor if there's a possibility you are pregnant and discuss any recent illnesses, medical conditions, allergies and medications you're taking, including herbal supplements and aspirin. You may be advised to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners several days prior to your procedure. You also may be told not to eat or drink anything after midnight before your procedure. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown. Plan to have someone drive you home.

What is a discogram?

A discogram, or discography, is an interventional diagnostic imaging test that helps determine whether a specific intervertebral disc may be the source of back pain.

Intervertebral discs are sponge-like cushions between the vertebrae, or bones, of the spine. Discs act as a sort of shock absorber for the spine and help provide flexibility.

Each disc has a strong outer layer called an annulus and a center part, called a nucleus, made of a soft, rubber-like material. When discs bulge or rupture, they may press on the nerves of the spinal column and cause pain or weakness.

In a discogram, a contrast liquid is injected into the center of one or more spinal discs using x-ray guidance. This injection may temporarily reproduce the patient's back pain symptoms. As part of the procedure, an x-ray or CT scan also may be performed to obtain pictures of the injected disc.

What are some common uses of the procedure?

A discogram is typically performed to help diagnose the cause of back pain and to guide the treatment of abnormal discs. The procedure also may be performed prior to surgery to help identify discs that need to be treated or removed.

How should I prepare?

Prior to your procedure, your blood may be tested to determine how well your kidneys are functioning and whether your blood clots normally.

You should report to your doctor all medications that you are taking, including herbal supplements, and if you have any allergies, especially to local anesthetic medications, general anesthesia or to contrast materials containing iodine (sometimes referred to as "dye" or "x-ray dye"). Your physician may advise you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners for a specified period of time before your procedure.

Also inform your doctor about recent illnesses or other medical conditions.

You will likely be instructed not to eat or drink anything after midnight before your procedure. Your doctor will tell you which medications you may take in the morning.

You should plan to have a relative or friend drive you home after your procedure.

You will be given a gown to wear during the procedure.

Women should always inform their physician and x-ray technologist if there is any possibility that they are pregnant. Many imaging tests are not performed during pregnancy so as not to expose the fetus to radiation. If an x-ray is necessary, precautions will be taken to minimize radiation exposure to the baby. See the Safety page for more information about pregnancy and x-rays.

If you have not already provided your radiologist with prior relevant imaging exams (e.g., MRI of lumbar spine), bring them with you on the day of your procedure.

What does the equipment look like?

The equipment typically used for this examination consists of a radiographic table, one or two x-ray tubes and a television-like monitor that is located in the examining room. Fluoroscopy, which converts x-rays into video images, is used to watch and guide progress of the procedure. The video is produced by the x-ray machine and a detector that is suspended over a table on which the patient lies.

Other equipment that may be used during the procedure includes an intravenous line (IV), ultrasound machine and devices that monitor your heart beat and blood pressure.

The CT scanner is typically a large, box-like machine with a hole, or short tunnel, in the center. You will lie on a narrow examination table that slides into and out of this tunnel. Rotating around you, the x-ray tube and electronic x-ray detectors are located opposite each other in a ring, called a gantry. The computer workstation that processes the imaging information is located in a separate control room, where the technologist operates the scanner and monitors your examination in direct visual contact and usually with the ability to hear and talk to you with the use of a speaker and microphone.

How does the procedure work?

X-rays are a form of radiation like light or radio waves. X-rays pass through most objects, including the body. Once it is carefully aimed at the part of the body being examined, an x-ray machine produces a small burst of radiation that passes through the body, recording an image on photographic film or a special detector.

Different parts of the body absorb the x-rays in varying degrees. Dense bone absorbs much of the radiation while soft tissue, such as muscle, fat and organs, allow more of the x-rays to pass through them. As a result, bones appear white on the x-ray, soft tissue shows up in shades of gray and air appears black.

Until recently, x-ray images were maintained on large film sheets (much like a large photographic negative). Today, most images are digital files that are stored electronically. These stored images are easily accessible and are frequently compared to current x-ray images for diagnosis and disease management.

Fluoroscopy uses a continuous or pulsed x-ray beam to create a sequence of images that are projected onto a fluorescent screen, or television-like monitor. When used with a contrast material, which clearly defines the area being examined by making it appear dark (or by electronically reversing the image contrast to white), this special x-ray technique makes it possible for the physician to view joints or internal organs in motion. Still images or movies are also captured and stored electronically on a computer.

How is the procedure performed?

This examination is usually done on an outpatient basis.

A nurse or technologist will insert an intravenous (IV) line into a vein in your hand or arm so that sedative medication can be given intravenously. You must be awake during the procedure in order to communicate any of the symptoms that you are experiencing during the test.

You may be given medications to help prevent nausea and pain, and antibiotics to help prevent infection.

You will be positioned on the examining table on your side, rolled forward slightly. Pillows may be used to help keep you comfortable and in position.

You may be connected to monitors that track your heart rate, blood pressure and pulse during the procedure.

The area of your body where the IV is to be inserted will be shaved, sterilized and covered with a surgical drape. Hair at or near the site of the discography procedure will also be shaved.

Your physician will numb the area with a local anesthetic.

Guided by real-time x-ray images (fluoroscopy), the physician will insert a needle through your skin into the center of the disc being examined. Once the needle is inside the disc, a contrast material is injected and the needle is removed.

During the procedure you may be asked to describe your pain in terms of location, distribution and severity. If the injected disc is the source of your back pain, you may feel pain similar to what you experience on a day-to-day basis. The process may be repeated for additional discs. In order for the discogram to be considered an objective test, the operator cannot disclose what level is being injected and when the injection is taking place.

Pressure will be applied to prevent any bleeding and the opening in the skin is covered with a bandage. No sutures are needed.

Your intravenous line will be removed.

After the injections are complete, an x-ray or CT scan may be performed to further analyze the injected disc(s). When contrast material spreads outside a disc, it may indicate that there are fissures in the outer ring of the disc.

You will be taken to an observation area for at least 30 to 60 minutes.

This procedure is usually completed within one hour, depending on how many disc levels your doctor wants to evaluate.

What will I experience during and after the procedure?

You will feel a slight pin prick when the needle is inserted into your vein for the intravenous line (IV) and when the local anesthetic is injected. Most of the sensation is at the skin incision site, which is numbed using local anesthetic. You may feel pressure when the catheter is inserted into the vein or artery.

You may feel pain or discomfort during needle insertion as the needle is guided towards the disc of interest.

You will be asked and reminded to remain very still during the procedure.

As the contrast material passes through your body, you may experience a warm feeling which quickly subsides.

You may have some pain at the injection site for several hours after you go home. You may apply an ice pack to the area on and off for 20 minutes at a time. You may also take your usual pain medications as prescribed by your doctor. If the pain is severe and is associated with fever, then you should immediately see a physician.

Who interprets the results and how do I get them?

A radiologist, a physician specifically trained to supervise and interpret radiology examinations, will analyze the images and send a signed report to your primary care or referring physician, who will discuss the results with you.

Follow-up examinations may be necessary. Your doctor will explain the exact reason why another exam

is requested. Sometimes a follow-up exam is done because a potential abnormality needs further evaluation with additional views or a special imaging technique. A follow-up examination may also be necessary so that any change in a known abnormality can be monitored over time. Follow-up examinations are sometimes the best way to see if treatment is working or if a finding is stable or changed over time.

What are the benefits vs. risks?

Benefits

- A discogram assesses whether or not a specific intervertebral disc is involved in causing your back pain symptoms.
- No radiation remains in a patient's body after an x-ray examination.
- X-rays usually have no side effects in the typical diagnostic range for this exam.
- CT scanning is painless, noninvasive and accurate.
- A major advantage of CT is its ability to image bone, soft tissue and blood vessels all at the same time.
- Unlike conventional x-rays, CT scanning provides very detailed images of many types of tissue as well as the lungs, bones and blood vessels.

Risks

- Any procedure where the skin is penetrated carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- There is a very slight risk of an allergic reaction if contrast material is injected.
- There is always a slight chance of cancer from excessive exposure to radiation. However, the benefit of an accurate diagnosis far outweighs the risk.
- Women should always inform their physician or x-ray technologist if there is any possibility that they are pregnant. See the Safety page for more information about pregnancy and x-rays.
- The effective radiation dose for this procedure varies. See the Safety page for more information about radiation dose.
- CT scanning is, in general, not recommended for pregnant women unless medically necessary because of potential risk to the fetus in the womb.
- Nursing mothers should wait for 24 hours after contrast material injection before resuming breast-feeding.
- The risk of serious allergic reaction to contrast materials that contain iodine is extremely rare, and radiology departments are well-equipped to deal with them.
- A discogram is generally a safe procedure. However, there is a risk of the following complications:
 - infection of the injected discs
 - temporary worsening of chronic back pain
 - headache
 - nausea
 - injury to blood vessels or nerves in and around the spine
 - bleeding

- temporary numbness or weakness
- nerve damage
- paralysis.

A Word About Minimizing Radiation Exposure

Special care is taken during x-ray examinations to use the lowest radiation dose possible while producing the best images for evaluation. National and international radiology protection organizations continually review and update the technique standards used by radiology professionals.

Modern x-ray systems have very controlled x-ray beams and dose control methods to minimize stray (scatter) radiation. This ensures that those parts of a patient's body not being imaged receive minimal radiation exposure.

What are the limitations of a discogram?

Because a discogram is an invasive test, it is not typically used for the initial evaluation of back pain. A discogram is usually recommended after conservative treatment, such as medication or physical therapy, over a period of four to six months fails to alleviate back pain. Because a disc can be damaged without causing pain, the results of a discogram are usually combined with other test results to determine a treatment plan.

In some cases, MRI or CT scanning is a better alternative to a discogram for the diagnosis of back pain.

In the majority of cases, plain radiographs, spine MRI or spine CT (when MRI cannot be performed) are the primary exams indicated for the diagnostic evaluation of lower back pain. Other tests, such as myelography or discography, are often used in some situations to address specific clinical questions prior to performing surgical procedures.

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