



Spinal Cord Stimulator

What is a spinal cord stimulator?

A spinal cord stimulator involves a small device called a generator, similar to a pacemaker, that delivers small electrical impulses to the spinal cord through wires and leads that lie over the spinal cord. These impulses block pain signals from traveling through the spinal cord to the brain for processing. This effectively masks pain signals and prevents the patient from experiencing a portion of the pain. This can be an excellent way to treat chronic back, leg, or arm pain when other therapies have not been effective.

There are several types of spinal cord stimulator device systems, but all have 3 main parts:

- A pulse generator with a battery that creates electrical pulses
- Lead wire(s) with electrodes that deliver electrical pulses to the spinal cord
- A remote control system to adjust the settings or turn the device on and off

How is a spinal cord stimulator placed?

There are two stages for spinal cord stimulator placement. The first stage involves a temporary placement of the device to test its effectiveness for each patient. This is called a trial and is similar to a "test run." In the second stage, a more permanent device is placed in those patients who responded well to the trial. This stage is called permanent placement.

Both procedures are completed in a similar fashion. First, you'll lie on your stomach on an x-ray table and the doctor will numb the area with a local anesthetic. Then, using xray guidance, a needle will be placed to access the epidural space. When in the correct position, trial leads are inserted in the epidural space and positioned over a specific region of the spinal cord.

During the trial, you will be asked questions during the procedure to determine if the device is in the correct location. Once the leads are in the correct position, a bandage is placed and the wires are connected to an external generator that will be worn on a belt for the next 4-7 days. You will then be sent to the recovery area to be monitored for a few hours.

How effective is spinal cord stimulation?

Studies of effectiveness of spinal cord stimulation have been evolving with continued improvement as technology has improved. Previous studies have shown success rates from 62% to 84% ¹. Newer research indicates even higher success rates with spinal cord stimulation.

What are the risks?

The risk of complication from spinal cord stimulator placement are low. However, there could be bruising, soreness, and postoperative pain at the surgical site. Serious complications, including infection, hemorrhage, spinal cord compression leading to paralysis, or cerebrospinal fluid leak are rare. Some patients experience persistent pain at the electrode or stimulator site, generator migration and/or local skin irritation, or lead migration which can result in reduction in pain relief and re-operation.

What happens after the procedure?

You will wake up in the recovery area where you are closely monitored for a few hours. Most patients will be drowsy from the pain medications given during the procedure. The external generator will be programmed before you leave, and it will be worn on a belt for the next 4-7 days. You will be sent home with specific instructions on how to control the device. After this time, you will return to your doctor's office for removal of the temporary leads, which can be safely done in the office, and for discussion of effectiveness of the trial.

If the trial produces good pain relief and functional improvement, the second stage can be completed. The permanent placement involves a similar procedure to place leads in the epidural space, but wires are tunneled under the skin and attached to a generator that will be inserted under the skin in the back or flank region. This allows for long term use of the spinal cord stimulator.

Is a spinal cord stimulator trial right for you?

¹ Manchikanti, Laxmaiah & D. Kaye, Alan & J.E. Falco, Frank & A. Hirsch, Joshua. (2018). Essentials of Interventional Techniques in Managing Chronic Pain. 10.1007/978-3-319-60361-2.

Spinal cord stimulator placement can be effective for patients who have failed more conservative means to control pain, such as medication, injections, and physical therapy. This procedure has been studied and shown to be effective in patients with:

- Radicular pain radiating to either upper or lower limbs unresponsive to more conservative approaches
- Persistent back, neck, arm, or leg pain after neck or back surgery
- Complex regional pain syndrome
- Peripheral vascular disease
- Post-herpetic neuralgia
- Phantom pain

Spinal cord stimulator therapy is reversible. If a patient decides at any time to discontinue treatment, the electrodes, generator, and wires can all be removed.