

Spinal cord stimulation

Overview

Spinal cord stimulation therapy masks pain signals before they reach the brain. A small device, similar to a pacemaker, delivers electrical pulses to the spinal cord. It helps people better manage their chronic pain and reduce their use of opioid medications. It may be an option if you suffer chronic back, leg or arm pain and have not found relief with other therapies.

What is a spinal cord stimulator?

A spinal cord stimulator (SCS) device is surgically placed under your skin and sends a mild electric current to your spinal cord (Fig. 1). Thin wires carry current from a pulse generator to the nerve fibers of the spinal cord. When turned on, the SCS stimulates the nerves in the area where your pain is felt. Pain is reduced because the electrical pulses modify and mask the pain signal from reaching your brain.

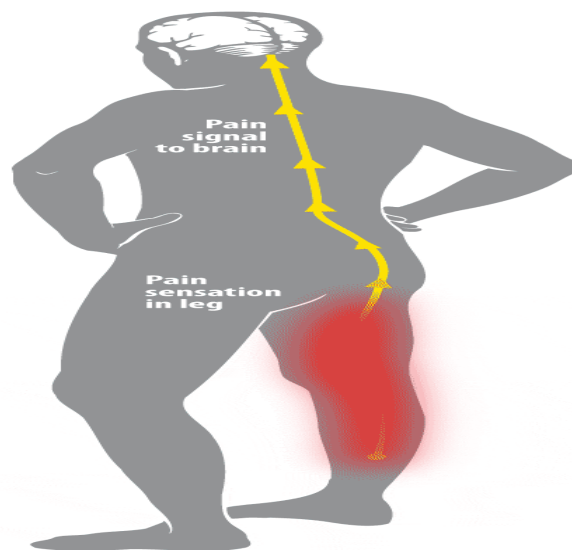


Figure 1. A spinal cord stimulator works by masking pain signals before they reach the brain. A stimulator device delivers electric pulses to electrodes placed over the spinal cord. Modified by the pulses, the pain signals are either not perceived or are replaced by a tingling feeling.

Some SCS devices use a low-frequency current to replace the pain sensation with a mild tingling feeling called paresthesia. Other SCS devices use high-frequency or burst pulses to mask the pain with no tingling feeling. A paresthesia-free setting is an option on most devices.

Stimulation does not eliminate the source of pain. It simply changes the way the brain perceives it. As a result, the amount of pain relief varies for each person. The goal for SCS is a 50 to 70% reduction in pain. However, even a small amount of pain reduction can be significant if it helps you perform daily activities and reduces the amount of pain medication you take. SCS does not improve muscle strength.

Stimulation does not work for everyone. Some people may find the sensation unpleasant. Other people may not get relief over the entire pain area. For these reasons a trial stimulation allows you to try it for a week. If it doesn't work for you, the trial wires can be removed, leaving no damage to the spinal cord or nerves.

There are several types of SCS device systems. However, all have three main parts:

- A pulse generator with a battery that creates the electrical pulses.
- A lead wire with a number of electrodes (8-32) that delivers electrical pulses to the spinal cord.
- A hand-held remote control that turns the device on and off and adjusts the settings.

Systems with a non-rechargeable battery need to be surgically replaced every 2 to 5 years, depending on the frequency of use. Rechargeable battery systems may last 8 to 10 years or longer, but you must remember to charge the system daily.

The pulse generator has programmable settings. Some SCS devices are able to sense a change in body position (sitting vs. lying down) and adapt the stimulation level to your activity. Other systems have leads that can be independently programmed to cover multiple pain areas. Some send a sub-perception pulse with no tingling. Your doctor will select the best type of system for you.

Who is a candidate?

An evaluation of your physical condition, medication regime, and pain history will determine whether your goals of pain management are appropriate for SCS. A neurosurgeon, physiatrist, or pain specialist will review all previous treatments and surgeries. Because chronic pain also has emotional effects, a

psychologist will assess your condition to maximize the probability of a successful outcome.

Patients selected for SCS usually have had chronic debilitating pain for more than 3 months in the lower back, leg (sciatica), or arm. They also typically have had one or more spinal surgeries.

You may be a candidate for SCS if :

- Conservative therapies have failed.
- You would not benefit from additional surgery.
- The pain is caused by a correctable problem and should be fixed.
- You do not want further surgery because of the risks or long recovery. Sometimes SCS may be chosen over a large, complex spine surgery.
- You do not have untreated depression or drug addiction; these should be treated prior to having a SCS.
- You have no medical conditions that would keep you from undergoing implantation.
- You have had a successful SCS trial.

SCS works better in the earlier stages of a chronic condition, before a cycle of pain-suffering-disability-pain is established.

An SCS can help lessen chronic pain caused by:

- Chronic leg (**sciatica**) or arm pain: ongoing, persistent pain caused by arthritis, spinal stenosis, or by nerve damage.
- Failed back surgery syndrome: failure of one or more surgeries to relieve persistent arm or leg pain, but not a technical failure of the original procedure.
- Complex regional pain syndrome: a progressive disease in which patients feel constant, chronic burning pain, typically in the foot or hand.
- Arachnoiditis: painful inflammation and scarring of the protective lining of the spinal nerves.
- Other: stump pain, angina, peripheral vascular disease, multiple sclerosis, or spinal cord injury.

Who performs the procedure?

Neurosurgeons and doctors who specialize in pain management (an anesthesiologist or physiatrist) implant spinal cord stimulators.

The surgical decision

Determining whether a spinal cord stimulator will be a good option for you is a two-step process. First, you must undergo a temporary trial to see if the device decreases your level of pain.

Stage 1. Trial "test drive"

Trial stimulation is a "test drive" to determine if an SCS will work for the type, location, and severity of your pain. It is performed at an outpatient center.

If you take blood-thinners, you are required to stop the medication 3 to 7 days prior to the trial.

A local anesthetic is given to numb the area in the lower back. Using X-ray fluoroscopy, a hollow needle is inserted through the skin into the epidural space between the bone and spinal cord. The trial lead is inserted and positioned over specific nerves. The wires are attached to an external generator worn on a belt (Fig. 2).

You will be sent home with instructions on how to use the trial stimulator and care for your incision site. Keep a written log of the stimulation settings during different activities and the level of pain relief. After 4 to 7 days, you will return to the doctor's office to discuss permanently implanting the stimulator or removing the trial leads.

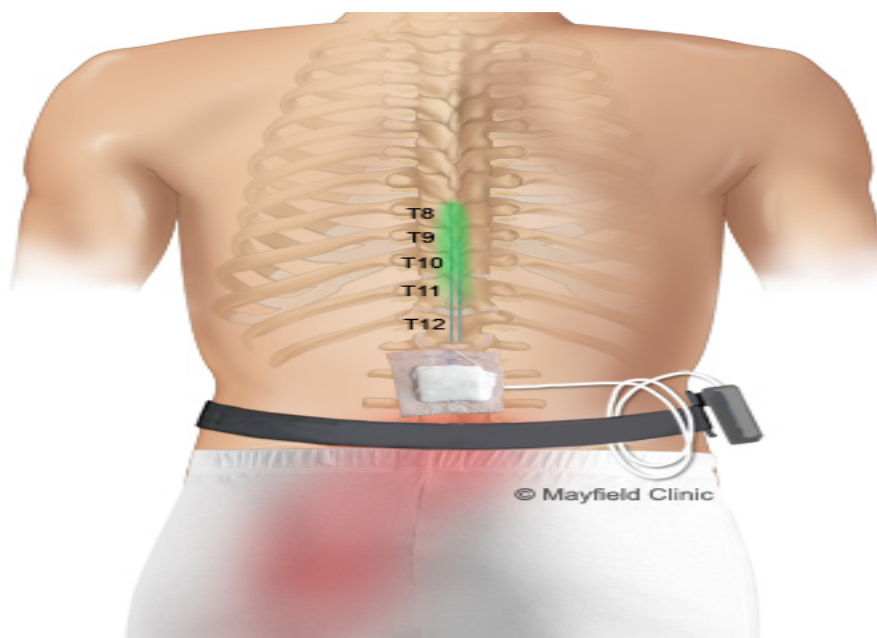


Figure 2. During a Trial SCS, temporary leads are placed in the spinal canal and a stimulator is worn on a belt. For several days you will test the device to see if it relieves your pain during various activities.

If the trial is successful and you felt greater than 50% improvement in pain, surgery can be scheduled to implant the SCS device in your body.

If you have more questions, please contact South Ga Spine, Joint and Rehab Center at 229-226-1035 or 229-416-4457