

Spinal Cord Stimulation

Key Points

- A careful assessment by a multidisciplinary team and discussion of the patient's expectations and goals will help identify the physical, psychological and socio-environmental factors contributing to the pain and appropriate candidates for spinal cord stimulation (SCS).
- SCS is a minimally invasive and reversible treatment for chronic pain.¹
- Education of the patient, increases their understanding of the potential benefits, risks and their responsibilities.
- SCS involves a screening test which provides the opportunity to assess the effectiveness for each individual patient.
- In contrast to earlier thinking on the order of treatments in the patient pathway², it has been proposed that SCS be considered at an earlier stage³.

What is Spinal Cord Stimulation

As an intervention for chronic pain, spinal cord stimulation (SCS) can be an effective alternative or adjunct treatment to other therapies that have failed to manage pain on their own.^{4,5}

An implantable neurostimulator delivers electrical pulses via a lead (tiny wire) to nerves in the dorsal aspect of the spinal cord. Pain signals are inhibited before they reach the brain and replaced with a tingling sensation (paraesthesia) that covers the specific areas where the pain was felt.

More than 250,000 people have received SCS to treat chronic pain worldwide.⁶ In recent years, technological advances have led to neurostimulation devices that can adapt to a person's physical activity and deliver uniquely programmed stimulation rhythms, as well as MRI compatible devices ensuring patients continue to have access to state-of-the-art diagnostic imaging in the future.

Who is a suitable candidate for Spinal Cord Stimulation?

SCS is indicated for management of chronic, intractable pain of the trunk and/or limbs, including unilateral or bilateral pain. A careful assessment by a multidisciplinary team, and discussion of the patient's expectations and goals, will help identify appropriate candidates for spinal cord stimulation. Some chronic pain conditions indicated include:

- Failed back surgery syndrome – persistent spinal and limb pain
- Refractory angina pectoris
- Neuropathic pain secondary to peripheral nerve lesion
- Radicular pain following cervical spine surgery
- Peripheral neuropathic pain syndromes that may have been caused by trauma
- Complex regional pain syndrome⁷

What does the spinal cord stimulation procedure involve?

There are generally two stages for patients recommended SCS; a screening test, followed by the implant procedure.

A *screening test* provides an opportunity to assess the effectiveness of SCS without making a long-term commitment. During a screening test, the patient receives a temporary, external neurostimulation system for 3 to 7 days. Either percutaneous leads or surgical leads can be used for the screening test.

In some cases the patient can use a patient control device to change some stimulation settings.

The goals of the screening test are to determine whether:

- Stimulation covers the patient's pain areas
- Patient is comfortable with the sensation of stimulation
- Patient experiences adequate pain relief
- Patient experiences improved function

The *implant procedure* involves a short surgery, and generally requires one night in hospital. The neurostimulator is inserted under the skin through a small incision in the upper buttock. The long-term lead is implanted in the epidural space of the spinal cord. SCS is minimally invasive and reversible.



When in the patient pathway should spinal cord stimulation be considered?

In contrast to earlier thinking on the order of treatments in the patient pathway,⁸ it has been proposed the device therapies be considered at an earlier stage.⁹

Benefits of SCS include:^{10,11}

- An effective method of pain control for many patients when used as directed
- May reduce the need for pain medications
- Less invasive than surgical alternatives
- Reversible - can be discontinued or if desired by the patient surgically removed
- Systems reprogrammable without surgery
- Trial helps assess patient response
- Patient control within preprogrammed limits

Which specialists in Australia offer spinal cord stimulation?

More than 50 pain management centres across Australia provide interventional pain management options to people with chronic pain. Generally, a spinal cord stimulation procedure is performed by a Pain Specialist and/or Neurosurgeon.

Multidisciplinary Pain Clinics have been established in many of Australia's leading hospitals, accepting referrals from pain centres and general practitioners. These clinics can provide a thorough overview of all treatment options available.

- 1 Atkinson L et al. Recommendations for patient selection in spinal cord stimulation. *J Clin Neurosci* (2011), doi: 10.1016/j.jocn.2011.02.025
- 2 Krames ES. Intrapinal Opioid Therapy for Nonmalignant Pain: Current Practices and Clinical Guidelines. *J Pain Symptom Manage* 1996;11:333-352
- 3 Stamatos JM, et al. Live Your Life Pain Free, October 2005. Based on the interventional pain management experience of Dr. John Stamatos.
- 4 Chan CW, Peng P. Failed Back Surgery Syndrome. *Pain Medicine*. 2011 Apr;12(4):577-606.
- 5 Manchikanti, L, Boswell MV, et al. Comprehensive review of therapeutic interventions in managing chronic spinal pain. *Pain Physician*. 2009 Jul-Aug;12(4):E123-98
- 6 Medtronic data on file
- 7 Atkinson L et al. Recommendations for patient selection in spinal cord stimulation. *J Clin Neurosci* (2011), doi: 10.1016/j.jocn.2011.02.025
- 8 Krames ES. Intrapinal Opioid Therapy for Nonmalignant Pain: Current Practices and Clinical Guidelines. *J Pain Symptom Manage* 1996;11:333-352
- 9 Stamatos JM, et al. Live Your Life Pain Free, October 2005. Based on the interventional pain management experience of Dr. John Stamatos.
- 10 Kumar K, Taylor R, Jacques L, et al. *Neurosurgery*. 2008;63:762-770.
- 11 Burchiel KJ, Anderson VC, Brown FD, et al. Prospective, multicenter study of spinal cord stimulation for relief of chronic back and extremity pain. *Spine*. 1996;21:2786-2794.