

Pain Diagnostics And Interventional Care

Spinal Cord Stimulation (SCS)

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Spinal Cord Stimulation (SCS) involves the delivery of pulsed electrical signals near the spinal cord to reduce and control pain for certain medical conditions. It was originally described by Shealy* in 1967. Since its introduction, major improvements and discoveries have helped us understand how SCS works, for which conditions it is beneficial, and the optimum equipment design. The new advancements in technology have resulted in significant progress in effectively managing pain.

Technique and Mechanism of Action

The effective treatment of chronic pain cannot always be achieved with minimally-invasive pain treatments. SCS may be considered when medical management, surgical intervention, and physical therapy have not been effective in relieving pain. Two stages are involved in SCS. In both stages, a physician guided by an x-ray, places a lead into the epidural space located within the spinal canal. The first stage is the trial phase which provides information to predict the success of permanent implantation. During the trial phase, one or two leads are placed via an epidural needle in the appropriate position. This is an outpatient procedure performed under light sedation.

The lead is programmed with a computer. The patient then goes home for three to seven days with an external power source and remote control that allows the patient to

control the amount of stimulation being received. At the end of the trial, the patient returns to the office to discuss the results and have the leads removed. Together, the healthcare provider and the patient decide whether to advance to permanent implantation based upon pain reduction and functional improvement. During permanent implantation the leads are again placed and implanted beneath the skin with a power source the size of a pacemaker battery.

Make sure Therapy is Right for you

Some respond better to SCS than others, which is why selecting the right individuals is so important. Prior to SCS treatment, patients should have tried other conservative therapies and have undergone psychological screening to ensure the underlying psychological conditions have been addressed and effectively treated. Furthermore, it is important for the patient and health care provider to have realistic expectations regarding treatment, with the goal being pain reduction and control rather than complete elimination.



IN THIS ISSUE

Learn about spinal cord stimulation and the different technologies available at Pain Diagnostics and Interventional Care.



Advancements

Since the introduction of SCS therapy, there have been significant advancements in both the hardware and software to significantly improve pain control. The advancements in SCS give patients more control of the settings to optimize pain control and improvement in function.

For More Information:

Dr. David Provenzano is the President of Pain Diagnostics and Interventional Care. For more information on Spinal Cord Stimulation, or our practice, visit davidprovenzanomd.com or call our office at 412-221-7640

Some Conditions Managed with SCS:

- Pain after back/neck surgery
- Low back pain
- Complex regional pain syndrome
- Nerve pain including neuropathy
- Peripheral vascular disease**
- Ischemic heart disease**

SCS has been proven to be highly effective for many of these conditions with lasting results in terms of pain relief, pain medication reduction, and improvement in quality of life indices and satisfaction scores. For example, approximately 10 to 40 percent of people in the United States that have had previous surgery for back pain continue to have significant pain. Compared to another operation for persistent back and extremity pain, SCS is often more clinically effective and more cost effective. A significant advantage of a SCS system is that it is a reversible and nondestructive treatment option.

Advancements in SCS Therapies

High Frequency 10 kHz (HF-10) Spinal Cord Stimulation Therapy

HF10 stimulation involves energy transmission which is not felt by the patient. Unlike with traditional SCS systems, patients do not feel a buzzing or tingling sensation. The device can be used while sleeping and driving. Patients may experience better coverage of low back pain.

Burst Stimulation

Burst stimulation also involves energy that is not felt by the patient. It activates an additional pain pathway which may offer improved pain relief in people who have not responded to traditional stimulation or who have complex back pain.

Dorsal Root Ganglion (DRG) Stimulation

The DRG is a cluster of nerve cells stemming from the spine. Stimulation of the DRG is a useful method to manage pain that has traditionally been difficult to manage with traditional SCS programs such as the feet, abdomen, and groin. Complex Regional Pain Syndrome (CRPS), formerly known as Reflex Sympathetic Dystrophy (RSD) responds to this treatment. Most people have pain relief without feeling tingling.

MRI Compatibility

Traditionally, spinal cord stimulators have not been compatible with Magnetic Resonance Imaging (MRI). Recently, MRI compatible spinal cord stimulators have been approved which allow patients with the implanted device to undergo MRIs. In a recent article published by Dr. Provenzano, a patient with multiple sclerosis (MS) underwent an MRI compatible spinal cord stimulator implantation. Because of the MRI compatibility, the patient is able to undergo MRI imaging of the brain and spine, which is essential for those with MS.*** Since undergoing the SCS implant, the patient has reported significant pain reduction and improvement in his overall function and quality of life.

* Shealy CN, Mortimer JT, Reswick JB (1967).

"Electrical Inhibition of pain by stimulation of the dorsal columns: Preliminary Clinical Report." *Anesth Analg* 46: 489-91.

**Not FDA-approved indications

*** Provenzano DA, Williams JR, Jarzabek G, DeRiggi LA, Scott TF. (2016). "Treatment of neuropathic pain and functional limitations associated with multiple sclerosis using an MRI-compatible spinal cord stimulator: a case report with two-year follow-up and literature review." *Neuromodulation* 19:406-13.

NEWS

Our research team has recently published an article in *Neuromodulation: Technology at the Neural Interface* titled "The Efficacy of High-Density Spinal Cord Stimulation among Trial, Implant, and Conversion Patients: A Retrospective Case Series" which demonstrated successful treatment of Complex Regional Pain Syndrome with the use of HD SCS settings.

Pain Diagnostics and Interventional Care is dedicated to providing the highest quality of care to all patients through evidence-based medicine. To learn more, please visit our website davidprovenzanomd.com or call our office at 412-221-7640.



PRESENTATIONS

Dr. David Provenzano will be speaking and presenting at several upcoming national and international pain meetings.

September 2017

The European Society of Regional Anesthesia and Pain Therapy, Lugano, Switzerland

<http://www.esra2017.com/>

October 2017

The American Society of Anesthesiologists Annual Meeting, Boston, Massachusetts

https://www.asahq.org/annualmeeting/?utm_source=asahq&utm_medium=landing-page&utm_campaign=Annual-Meeting

November 2017

16th Annual American Society of Regional Anesthesia and Pain Medicine Meeting, Orlando, Florida

<https://www.asra.com/page/1356/pain-medicine-meeting>

December 2017

The New York State Society of Anesthesiologists, Inc. Postgraduate Assembly in Anesthesiology, New York, New York.

<http://www.nyssa-pga.org/pga-meeting>