

Chronic Pain Management Service

Spinal Cord Stimulation Therapy Permanent Device

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What is spinal cord stimulation therapy?

Spinal cord stimulation is a proven safe therapy for some types of chronic pain. In a selected group of patients, it can provide good pain relief especially when all other therapies have failed. It may also be called Neuromodulation therapy.

What is a spinal cord stimulator?

A spinal cord stimulator (SCS) is an electrical device that can change some of the pain messages that your body sends to your brain. Nerve signals from all over the body travel to the brain through the spinal cord. The brain translates the signals into different sensations; one of them can be pain. The stimulator stops / interferes with these signals at the level of the spinal cord, so that they are not perceived as pain.

How does a spinal cord stimulator work?

Electricity has been used to treat pain for centuries. Over the last 40 years, we have started to understand how electricity actually works to treat pain. We know that if we send small amounts of electricity to specific parts of the spinal cord this can change the way pain signals are processed and this can have a dramatic effect on pain in some people.

There are several theories about how this therapy works but nobody knows exactly how:

1. It blocks the nerves in the spinal cord so that the signals are not transmitted to the brain
2. It releases the body's own morphine which produces relief without causing side effects seen by morphine taken from the outside.

What type of pain can it be used for?

This therapy does not always work and therefore is not suitable for all types of pain. It has been proven to be effective and licenced for pain associated with nerve damage which is called neuropathic pain. It is usually offered if neuropathic pain cannot be managed with medicines and other treatments such as physiotherapy or injections.

A few examples are:

- Back and leg pain which persists after spinal surgery
- Post-surgical pain, pain due to nerve damage after surgery like appendicectomy, hernia repair, breast surgery etc
- Pain caused by nerve damage due to certain diseases like diabetes and neuropathy
- Complex regional pain syndrome (CRPS)

There are many other conditions and you can ask your doctor if this therapy is suitable for your pain.

How many types of spinal cord stimulator are there?

There are different types of spinal cord stimulator available. Your doctor will decide which stimulator you will have depending upon your pain condition and what is best for you.

Depending on which stimulator you have, you may feel a warm tingling feeling in the affected area which is called paraesthesia-based stimulation therapy or not feel anything at all. Your doctor may try different settings before deciding which is best for you.

What are the parts of a spinal cord stimulator?

Spinal cord stimulators have four parts:

- 1. A very small battery / computer:** that controls the stimulating system – this is about the size of a small match box. It is usually placed by making a small pocket under the skin and subcutaneous fat which can be done under a local or general anaesthetic. Its position can vary depending on the type of implant and your preference. Usually the position is in the abdominal wall, buttock or the side of your chest. Your doctor will discuss this with you at the time of consent. The battery can be non-rechargeable or rechargeable. You may need to recharge the battery if they are rechargeable and the duration of recharging will depend on how much energy you are using (every day to once every few weeks). You do not need to do anything if it is a non-rechargeable battery.
- 2. An electrode or lead:** that sits near your spinal cord. This sends tiny amounts of electricity to your spinal cord. This is very accurate and safe. They are placed in the epidural space (outside your spinal cord) usually under local anaesthetic.
- 3. An extension lead:** that passes under the skin and connects the battery to the electrode in your spine.
- 4. A hand-held controller:** that you can use to switch the spinal cord stimulator on or off and adjust it.

How effective are spinal cord stimulators?

As with any operation, not everyone benefits from this therapy. Spinal cord stimulators help some people more than others. It is not a magic cure and will not take the pain away completely even in those that find it helpful. Approximately 60 - 70% of patients obtain 50% pain relief.

Ask your specialist what the results are for people with your particular condition.

What are the benefits of spinal cord stimulation therapy?

The main benefit will be improvement in pain if this therapy is successful. You may be able to reduce your medication but we do not advise you to do this at the start of your therapy as it may become difficult to assess the pain relief you are getting with the SCS therapy. The other benefit related to pain relief is improvement of functioning.

What are the risks associated with spinal cord stimulation therapy?

There are risks with any surgical procedure. Most of the problems that can happen with spinal cord stimulation are minor, but there are a few rare problems that you should know about.

It is important that you ask your specialist about how common the following problems are:

Infection: You may develop an infection as a result of the operation. The risk of developing an infection is about 2 - 5 in 100 patients. Most infections do not cause serious problems, but your doctor may need to take out all or part of the spinal cord stimulator to be able to effectively treat the infection.

Lead problems: The electrode in your spine may move or break and you may need more surgery to reposition it (usually no more than one more surgery). Usually about a quarter of patients may need further surgery.

Bleeding: There is a chance of post-operative bleeding and formation of clots around the spinal cord or at the battery site. Your doctor may decide to treat it conservatively (keeping you under observation) or need to take you back to the operating theatre depending on the individual situation to stop the bleed. Very rarely there can be a blood clot around the spine (epidural haematoma) which may compress the spinal cord and may require major spinal surgery.

Battery replacement: The battery will need replacing every few years. This can usually be done under local anaesthetic. Both types of battery, rechargeable or non-rechargeable, will need to be replaced after a few years which will require another small surgery (4 - 5 years for non-rechargeable and 7 - 10 years for rechargeable but rarely it can be sooner).

Failure of therapy: It may not work for you, in 30 - 40% of cases during the trial or after the final implant (even though you had good pain relief during the trial in some cases). Your doctor may offer to remove the metalwork, or not, depending upon individual cases.

Nerve injury / Spinal cord injury: As with any operation on the spine, there is a chance that the spinal nerves are damaged. This happens very rarely, but it is of course something that we check for in our first few hours after your operation. This may require further spinal surgery.

Scar: You will have a scar at the spine and at the site of the battery. There may be further scarring depending on different situations.

Allergic reaction: You may develop an allergic reaction to local anaesthetic or to the metal in the stimulator which may require resuscitation and / or removal of the system.

CSF leak: The fluid around the spinal cord can leak and cause swelling around the spinal wound, which is called a CSF Hygroma. In most of the cases we do not need to do anything and it will resolve spontaneously over time. Leakage of the CSF fluid can produce severe frontal headaches, which are usually treated with fluids, pain relief medication and bed rest and rarely further treatment.

Problems related to local anaesthetic: Rarely, local anaesthetic can go into the wrong places. It can cause motor block and numbness in the lower half of the body if it goes into the spinal fluid, which will spontaneously resolve over a few hours and will need monitoring. The local anaesthetic injection in a blood vessel may cause fits and will need resuscitation. This list is not comprehensive and there may be other minor problems related to the therapy, which will depend on an individual basis and your doctor may discuss them with you.

How will I know if my pain is suitable for spinal cord stimulation therapy?

Your pain specialist with expertise in spinal cord stimulation will tell you if your pain can be suitable for spinal cord stimulation.

What happens if my pain specialist thinks my pain is suitable for the spinal cord stimulation therapy?

If your specialist thinks you are suitable for the SCS therapy they may invite you to attend a Multi-disciplinary team (MDT) assessment meeting in the Pain Clinic. MDT assessments usually consist of a Pain Consultant, Neurosurgeon, Psychologist, Physiotherapist and a Specialist Pain Nurse. They will ask you again about the pain, the effect it has on your life and the treatments you have tried so far in detail. The purpose of this specialist clinic is to offer advice on the approach to treating and managing your pain in your best interests.

Attending this clinic does not necessarily mean that you will be offered the spinal cord stimulation, but that the team will recommend what they consider the most suitable treatment for you. This approach is part of the national guidance in the care of these devices. This also gives us the opportunity to assess your expectations of this treatment if it is offered. The consultation will give you opportunity to ask questions and discuss queries that you may have about your pain and potential therapy.

What will happen if my pain is suitable for this therapy?

If you are offered the SCS therapy in the MDT meeting:

- We will bring you back to clinic to discuss in detail about the procedure, benefit and risks attached to the therapy and to sign a consent form.
- You may get a separate appointment for the pre-assessment for anaesthetic, which will be looking into your general health, taking blood samples and swabs for MRSA and COVID.
- **Trial of SCS:** Most patients are offered a trial of the therapy for 1 - 2 weeks but your specialist may decide to do the full implant depending on what is best for you. You will be expected to maintain a pain diary during this time to assess whether it has been successful or not.
- You will come for a review visit after a week and depending on the result of the trial, your specialist may decide to end or extend the trial.
- **Final stage implant:** If the result of the trial is positive, you will be offered a final stage implant of the battery.

What does the trial of the SCS therapy involve?

You will come to the surgical admissions unit and will be admitted for the procedure. Once in theatre, one or two leads are positioned in the epidural space (next to the spinal cord) under X-ray guidance and will have a small external battery attached.

A nurse will see you after theatre to ensure you know how to use the system and provide you with a pain diary, dressings and contact numbers. For some patients they will be able to return home the same day, but for other patients may have to stay overnight. You will be seen in the morning before you are discharged. Please bring an overnight bag and all your medications in case you need to stay overnight. You will receive a separate information leaflet with more detailed information about the trial.

After you leave hospital

- It is important to keep your wounds dry and clean, until they have healed and the stitches or staples have been removed.
- If you spot any signs of infection such as redness, swelling or leakage from your wound sites, contact us immediately (rather than your GP) using the telephone numbers provided.
- You will be given a post-operative follow-up clinic appointment 2 - 6 weeks after implant to 1) check that your wounds have healed well and 2) assess whether you also need a separate session to tune your stimulator in our programming clinic.

Following discharge from hospital with an SCS we advise that you have a period of rest, with gentle mobilisation and regular movements for best healing. Heavy lifting, twisting and bending should be avoided in the early weeks. Normal activities of daily living, i.e. washing, dressing, etc. can be resumed immediately post-operative. However, we recommend no showers or baths until after your sutures / clips have been removed and the wound areas are healed.

We expect that the procedure will eventually enable you to perform normal daily activities easier, however please be sensible and avoid activities that could damage or displace the system (**sudden**, **excessive** or repetitive bending, stretching, twisting, bouncing or impact).

Wound management

- If at any time you have any concerns regarding your wounds, please contact the Pain Team **in the first instance**. Due to having an implanted IPG and electrode, it is important to contact us as early as possible with any signs of infection.
- If infection does develop, it can occasionally lead to the system having to be removed whilst the infection is treated and a new system implanted at a later date.

Signs of Infection

- **Redness and / or swelling around the wound areas**
- **Leaking from wound**
- **Pain around the wound areas**
- **Feeling feverish or unwell (Flu like symptoms)**

Which medical treatments or investigations are hazardous to have with the stimulator and require your prior permission?

- MRI scans (used in X-ray departments). There are rare exceptions so please contact us or ask your doctor to do so.
- Ultrasound (Used in X-ray and physiotherapy departments)
- Short wave diathermy (Used in Physiotherapy departments)
- Electrocautery (used in surgery)
- Radiotherapy (Used in X-ray departments for cancer treatment)
- Lithotripsy (Used to breakup bladder, kidney and gall stones)
- Bone growth stimulators (internal or external)
- Cardiac Pacemakers

Should you require further advice on the issues contained in this leaflet, please do not hesitate to contact the Pain Team **(01482) 678868**

Further information

You may wish to find out more about spinal cord stimulation. We recommend the following websites:

- www.nice.org.uk/
- www.nlm.nih.gov/medlineplus/ency/article/007560.htm
- <https://paindoctor.com/treatments/spinal-cord-stimulation/>
- www.britishpainsociety.org/static/uploads/resources/files/book_scs_patient.pdf

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