SACRAL NEUROMODULATION FOR PERSISTENT PAIN

WHAT IS NEUROMODULATION?

Also called neurostimulation, neuromodulation involves electrical stimulation of the nervous system for the purpose of modulating or modifying a function, such as the perception of pain. It has a long history, dating all the way back to Ancient Rome using contact with an electrical Torpedo fish as a treatment for gout pain. Observations over time and advances in science have refined the technique and leaders in the field continue to discover new ways to help reduce pain perception (Gildenberg, 2006).

HOW DOES IT WORK?

Neuromodulation is thought to work via:

1. The gate control theory of pain put forth by Melzack and Wall (1967). The stimulation of lots of other nerve fibres (such as those for touch) floods the 'gate' and the pain signals 'can't fit through the gate', and effectively the 'gate is closed' to pain.
2. Stimulating one system and inhibiting another system, such as bladder filling and sphincter control.
3. Replicating the natural firing pattern of the brain to reduce pain perception.

Functional MRI studies have shown that with neuromodulation the same regions of the brain are stimulated, but the person is not as bothered by the pain ie. their perception has vastly changed about their pain.

This is an exciting new field of research involving the limbic system (linked to our emotions and memory and generates the quality to our pain) and the autonomic nervous system (involuntary nervous system for many body functions such as digestion, heart rate, blood vessel control etc).

WHAT TYPES OF NEUROMODULATION ARE AVAILABLE?

Spinal Cord Stimulators (SCS) / Sacral Neuromodulators (SNM)

Electrical stimulation has been used for over twenty years for pain management and has very few side effects.

Current models have 4 very slim leads and a small rechargeable battery pack (that sits under the skin on the upper buttock) with a wireless remote.

Traditional neuromodulation involves replacing the areas of pain with gentle tingles. A newer type of programming involves bursts of stimulation then a pause, which can't be felt at all, and may be preferred if you don't like the tingles. This has been shown to produce better results for pain relief

with fewer side effects and is thought to work directly on the brain. The exact mechanism of action for SCS is still unclear and more high-quality research is needed. At WHRIA we use Boston Scientific Neuromodulators. A review of the last 20 years of literature suggests this is safe and effective therapeutic modality, but it must be emphasised that it is one part of a whole pain management program.

WHERE CAN WE USE MODULATION?

Historically the classic neuro-stimulators or neuromodulators were at a spinal cord level, now we have more options to modulate the nervous system's signals and tailor it directly to your particular pain or complaint.

Field Modulation

Right where it hurts. A TENS machine through the skin via stick-on electrodes (non-invasive, home device), or via an implantable device (requires surgery) with the leads covering the area of pain (see below for more information). This is particularly effective for cluneal neuralgia, where the pain is located at the lower part of the buttocks.

Direct modulation of the nerve causing the pain

Once confirmed via a diagnostic nerve block (temporary relief from your particular pain) this method can be very specific. WHRIA use this method for pudendal neuralgia (PN), where the leads are placed close to the pudendal nerve.

At the level of the spine

- at the spinal nerves within the tailbone (sacrum) in the pelvis
- at the spinal cord, higher up in the back

Spinal cord stimulators (SCS) are used for back pain or headaches and the leads are placed near the spinal cord level on the correlating area of the spine. For pudendal neuralgia the leads are placed near the S2/3/4 spinal nerves, in the sacrum (tail bone), as the spinal cord ends well above this level.

Sacral Neuromodulation – The 'Sydney Protocol" used at WHRIA

WHRIA has been using sacral neuromodulation for pelvic pain since 2011. We call it the 'Sydney Protocol', using two 'pain' leads and the addition of two extra leads for bladder or bowel complaints.

The two pain leads are placed in the sacral bone, in a 'V" shape to influence the S2, S3 and S4 nerve roots, that make up the pudendal nerve, then any combination of the following to a total of four leads:

- S3 lead in the tail bone for bladder complaints such as urgency, pain or leakage
- S4 lead in the tail bone for bowel complaints such as pain or leakage
- A lead next to the pudendal nerve near your sit bone for pain management or bladder/bowel complaints

Trial SNM Procedure

A temporary or trial procedure is conducted for 7-10 days to determine if it provides enough improvement in your symptoms to go ahead with a permanent procedure.

WHRIA's Osteopath, Liz Howard has been trained as a clinical specialist for the Boston Scientific neuromodulator we use at WHRIA. You can book an education appointment to discuss the procedure in detail and see all the equipment used. There is no fee for this appointment.

The trial leads are placed inside the body, as for the permanent procedure, and the programming battery pack is worn in a belt around the waist. You are unable to shower or bath for the trial, but sponge bathing is permitted. The leads are lightly stitched to the skin and are easily removed at the end of the trial. If you are from interstate, your GP may be able to remove your leads if you prefer to travel home before the end of your trial. It is important that you avoid squatting, bending, twisting and lifting more the 2.5kg for the duration of your trial, as the leads can move and may no longer cover your area of pain.

The surgery is performed at the Prince of Wales Private Hospital in Randwick. You will be laying on your stomach and local anaesthetic with light sedation is usually used. You will not remember the procedure. You will stay one night in hospital and Liz Howard or Denise Winkler will attend the morning after your surgery to program your neuromodulator. You are given a diary to record your activities, pain and any bladder, bowel or sexual symptoms.

Liz or Denise will be in regular contact to help you navigate the trial and use the programs to the full potential with your remote control.

If you are from out of town, please plan on staying 4 to 5 days total in Sydney, so that we are able to optimize your programs and facilitate the best trial to help relieve your pain. Pack loose clothing.

If you decide that it has helped your pain or pelvic symptoms enough to go ahead with a permanent procedure, we need to wait for 6 weeks for complete tissue healing. This also give you time to be sure that the SNM device is right for you.

Checklist for booking a trial SNM:

- Education session with Liz Howard
- Hospital booking forms completed and returned to WHRIA
- Book accommodation in Sydney if required (after your procedure you will be programmed once at the hospital then 2-3 times at WHRIA; city accommodation after the procedure is ideal, or near a train station)
- WHRIA will call you with a surgery date
- Book 2 programming appointments with Liz Howard at WHRIA during your trial, day 3-4 and day 6-7 is ideal
- Book a surgical follow up appointment with your doctor and Liz Howard for programming on the final day of your trial/final day in Sydney for lead removal (or book your GP appointment)
- The hospital will call you with an admission time, after 4pm the DAY BEFORE YOUR SURGERY (admission is usually early morning) The anaesthetist may also call you.
- Morning of: your doctor and Liz or Denise will see you before you go into surgery for any final questions

Permanent SNM Procedure

If you decide it has helped your symptoms more than 50%, you can book the permanent procedure anytime after 6 weeks healing time. This surgery is very similar to the trial procedure, other than:

- The cuts are slightly larger
- Surgical pain is slightly more
- You may undergo a general anesthetic
- The 'computer pacemaker' that generates the impulses is placed 2cm under the skin on the upper buttock (you can choose which side) and the leads are connected to this battery

You will stay a minimum one night in hospital and Liz Howard or Denise Winkler will attend the morning after your surgery to switch on and program your neuromodulator. Plan on staying 1-2 weeks in Sydney in total so that we can optimize your programs.

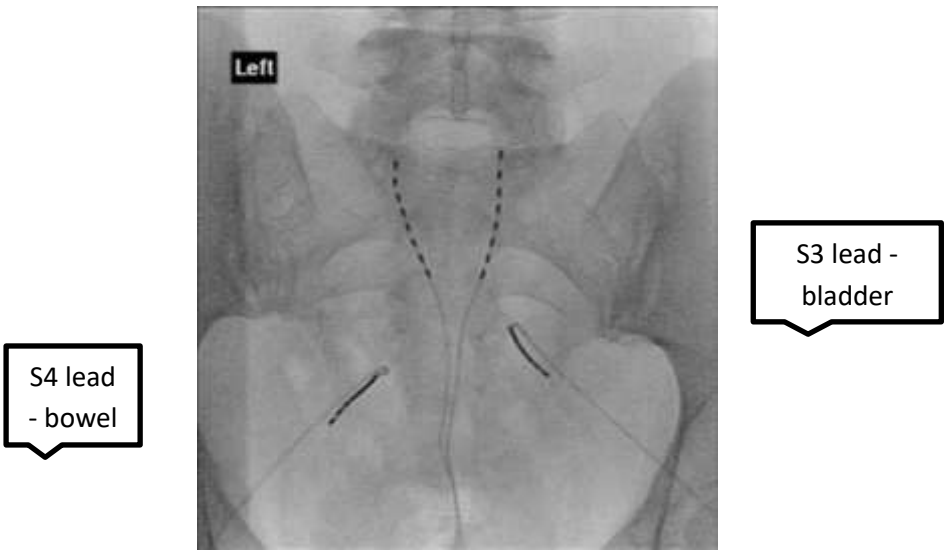
You must avoid squatting, bending, twisting and lifting for 12 weeks so that the leads can 'settle into place'. Your body forms natural scar tissue around the leads over the 12 weeks. An X-ray is performed at the 12-week mark to check your leads are in place.

The battery pack can move about if there is significant weight loss. If you are above your healthy weight range, it is worth trying to lose some weight before your procedure so that this is not an issue afterwards, as it may require another surgical procedure.

Checklist for a permanent SNM:

- Education session with Liz Howard
- Hospital booking forms completed and returned to WHRIA
- WHRIA will call you with a surgery date
- Book 2 programming appointments with Liz Howard at WHRIA after your surgery, day 3-4 and day 6-7 is ideal
- Book accommodation in Sydney if required (after your procedure you will be programmed once at the hospital then 2-3 times at WHRIA; city accommodation after the procedure is ideal, or near a train station)
- Book a surgical follow up appointment with your doctor to check wounds and Liz Howard for programming on the final day in Sydney/ at 2 weeks after your procedure, and ideally 3 months after

- The hospital will call you with an admission time, after 4pm the DAY BEFORE YOUR SURGERY (admission is usually early morning)
- Morning of: your doctor and Liz or Denise will see you before you go into surgery for any final questions



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Melzack, R., & Wall, P. D. (1967). Pain mechanisms: a new theory. *Survey of Anesthesiology, 11*(2), 89-90.

Boston Scientific: Control Your Pain Website for Patients considering Spinal Cord Stimulation https://www.controlyourpain.com/