

Sacral Neuromodulation in Pelvic Floor Disorders

Therapy helps normalize organ function

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What is Sacral Neuromodulation?

Since its introduction in 1990s sacral neuromodulation (SNM), also known as sacral nerve stimulation (SNS), has proven to be a useful treatment of chronic dysfunction of the urinary, bowel and pelvic floor. The sacral nerve controls a person's bladder, bowel and pelvic floor and the muscles related to their function. The device is implanted surgically and stimulates the sacral nerve with mild electrical pulses. It enables the person to perceive the sensation of bladder fullness and the desire to void. It also helps a patient to spontaneously and completely empty the bladder.

Who Will Benefit from Sacral Neuromodulation?

Patients with chronic urinary retention, voiding dysfunction, bowel dysfunction and chronic pain syndromes can benefit from this device. Indeed, it may be the only therapy available in some patient groups. In patients with chronic urinary retention, the only known forms of treatment are clean intermittent self-catheterization (CISC) or indwelling suprapubic/transurethral catheters. At times CISC can be a painful and traumatic process, and SNM offers an effective therapeutic alternative.

Principle of Sacral Neuromodulation

The sacral nerves serve the lower urinary tract. To activate or inhibit urinary tract reflexes, SNM delivers mild electrical impulses to the sacral nerves. Besides the local stimulation, neuromodulation also influences the higher centres of bladder control in the brain (known as Pontine micturition centre) although its mechanism is not yet clear.

Treatment affects reflexes locally, with influence from the relevant brain centre

The procedure is done in two stages under general anaesthesia. Local anaesthesia is sometimes offered.

Stage 1 Procedure

The stage 1 procedure involves inserting a permanent electrode through the lower back to lie near the sacral nerve. Its other end is connected to a temporary lead, which is tunnelled under the skin across the back and exits through the skin. It is connected to an external SNM on the day after surgery.

The procedure involves making three tiny incisions over the buttocks and lower back, which may have clips or stitches securing them.

Follow-up Care

Follow-up care will depend on the indication for the placement of the device. Patients with urinary retention will need to continue performing clean intermittent self-catheterisation (CISC) post-operatively until efficient bladder emptying is achieved.

Once good amounts of urine are passed spontaneously, the CISC pattern is changed to post-void only to check residual urine volume.

Test Phase

The test phase allows clinicians to judge how much a patient will benefit from a permanent SNM implant. The duration of this evaluation can be from 2 to 8 weeks. This time period also allows patients to learn how they will need to adapt their lifestyle and day-to-day work with the implant.

If the evaluation is successful, patients will proceed to the 2nd stage procedure and implantation of the permanent indwelling battery.

Possible Problems – Stage 1

The possible problems with the stage 1 procedure can be:

- Infection
- Bleeding
- Pain at the wound site - the pain may radiate down the back, buttock and thigh to the toes. Occasionally, transient weakness of the leg has been reported.
- Lead breakages - the externalised lead must be handled carefully. If it is pulled, the permanent electrode may move, leading to pain or loss of sensation. If this happens and the provider is in agreement, the patient will need Stage 1 repeated. Patients must avoid high intensity sport and strenuous work such as lifting weights and stretching to prevent dislodging the electrode for at least 6 months.

Change of Sensation

The settings on the SNM may need to be adjusted if the sensation changes or disappears. The settings will be checked and position of the electrode will be confirmed by X-ray.

Second-Stage Procedure

The second stage involves insertion of the permanent battery, which is connected to the previously implanted permanent electrode. The temporary lead coming out of the skin is removed during this procedure, which is usually performed under general anaesthesia.

Once the SNM is turned on, patients are expected to experience a similar sensation as described in the 1st Stage information, and positive bladder/bowel response should be sustained.

Post-surgical Care

Patients receive a handheld programmer and device card to carry at all times in order to inform any hospital, doctor or dentist of the implant.

Battery Life

The usual battery life is from 5 – 10 years, depending on the size of the battery, the amplitude of signal used and whether it is used continuously or cyclically.

Precautions

Patients should turn OFF the SNM before engaging in activities that could become unsafe for the patient or others if there were an unexpected jolt or shock (such as when using power tools).

Also:

MRI - Medical providers need to contact the department where the device was implanted if an MRI scan is planned as currently that is considered unsafe in patients with SNM.

Scans - Ultrasound, lithotripsy, or radiation therapy can interfere with the SNM so a patient MUST turn the device off during any investigations. Please contact the implanting department or ask the treating doctor to contact the surgeon if there is any doubt or query.

Diathermy - After the implantation, it is unsafe to have a monopolar diathermy. Inform anyone treating you that you CANNOT have any short wave diathermy, microwave or therapeutic ultrasound diathermy because of the implanted SNM. The energy from the diathermy can be transferred through the implant and cause serious tissue damage and injury that can be fatal. It can also damage the components of the implant and result in the failure of the therapy. The only acceptable diathermy is bipolar diathermy.

Security Systems - Theft prevention and security systems at shops and airport may go off due to the SNM. These systems may also adversely affect the SNM. A device identification card can be shown to anyone in charge in order to obtain permission to bypass any security device.

Appliances - Occasionally, household appliances such as refrigerators and audio speakers that have magnets may interfere with the SNM, which then may need to be restarted. Be aware that even if the SNM is turned off, nearby strong electrical gadgets can still affect the lead, which could result in a sudden and brief shock or jolt.

Sports & Exercise - In the first three months after the operation, providers recommend that patients avoid heavy lifting and strenuous exercises, especially with bending or twisting movements. After this recovery period implant users can do most forms of exercise such as swimming, running, aerobics etc. Horseback riding, skiing, and contact sport, however, seem to be associated with more lead or electrode breakage.

Pregnancy

The effect of SNM on pregnancy is largely unknown. Therefore, it is advised that you must have your SNM turned OFF by the hospital if you are planning to start a family or as soon as you know that you are pregnant. Having an SNM does not mean that you need to have an elective caesarean section. The decision for any obstetric intervention remains with your designated obstetrician.

If you have any further queries, please contact your surgeon.

Please note: *This information should not be used as a substitute for medical treatment and advice. Always consult a medical professional about any health-related questions or concerns.*

Further reading

1. Blok, B.F., et al., Different brain effects during chronic and acute sacral neuromodulation in urge incontinent patients with implanted neurostimulators. *BJU Int*, 2006. 98(6): p. 1238-43.
2. Hassouna, M.M., et al., Sacral neuromodulation in the treatment of urgency-frequency symptoms: a multicenter study on efficacy and safety. *J Urol*, 2000. 163(6): p. 1849-54.
3. Scheepens, W.A., et al., Long-term efficacy and safety results of the two-stage implantation technique in sacral neuromodulation. *BJU Int*, 2002. 90(9): p. 840-5.

Resources

Health Organization for Pudendal Education
<http://www.pudendalhope.org/>

International Foundation for Functional Gastrointestinal Disorders, Inc.
<http://www.aboutincontinence.org/>

Interstitial Cystitis & Overactive Bladder Network
<http://www.ic-network.com/>

National Vulvodynia Association
<http://www.nva.org>

Pelvic Floor Disorders Network
<https://www.pfdnetwork.org/>

Pelvic & Urological Resources & Education Helping Others with Pelvic-Pain Everywhere
<http://www.pure-hope.org/>