PERIPHERAL NERVE STIMULATION (PNS)

WHAT IS PNS?
Peripheral Nerve Stimulation means stimulating nerves away from the spinal cord.

WHY DO I NEED PNS?
You doctor has decided that PNS is better suited for your than Spinal Cord Stimulation (SCS), this could be because your pain is isolated to an extremity (Hand, Foot etc) and there is no need to stimulate the whole arm or leg as would happen with SCS.

IS PNS SAFE?
Peripheral nerve stimulation has been used successfully in thousands of people world wide over the last two decades. The U.S. Food and Drug Administration (FDA) and the Australian Therapeutic Goods Administration (TGA) has approved PNS for the treatment of certain types of chronic pain, including the arms, legs and trunk.

WILL I BE TOTALLY PAIN FREE WITH PNS?
Peripheral nerve stimulation is not a cure, so it is unlikely that PNS will eliminate all of your pain. The goal of PNS is to decrease sever chronic pain to the point where you can increase your participation in daily activities. The degree of pain relief varies from person to person. While many patients report significant reductions in pain, the therapy is generally considered successful if it reduces your pain by 50 percent or more.

WILL PNS ALLOW ME TO BE FREE OF PAIN MEDICINES?
Peripheral nerve stimulation is part of an overall treatment plan to manage chronic pain. Many people are able to decrease or even discontinue pain medications; however, there may be times when your pain increases and you might need pain medication in addition to your stimulation.

IS PNS SIMILAR TO TENS?
Both TENS and PNS use electricity impulses, both systems target local peripheral nerves, however only PNS can eliminate the skin interface which causes resistance to stimulation as well as other complications. The PNS electrode is place adjacent or surrounding the actual nerve, this gives a better quality of stimulation over a larger area than TENS.

IS PNS COVERED BY MY PRIVATE HEALTH INSURANCE?
Peripheral nerve stimulation is covered by private health insurance, they will pay for all the implanted components used, however they will not pay for external accessories post implant such as sticky tape patches, external antenna and skin treatment wipes.

WILL PNS WORK FOR ME?
Peripheral nerve stimulation's only indication is neuropathic pain, (injured nerve) so there is an excellent chance that this system will help if your doctor has diagnosed you with this indication.
To make sure PNS will help; a trial electrode can be inserted into the area and kept there for up to two weeks. During this time you will know if the systems will help you or not. After the trial period has finished the electrode is quickly removed in the doctors surgery; this takes a few minutes, and is practically painless.

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HOW LONG WILL THE BATTERY LAST?
Currently there are two systems that may be implanted as PNS.
A totally implanted battery called an Implantable Pulse Generator system (IPG)
An implantable passive receiver which is powered by an external transmitter called a Radio Frequency system. (RF).

An IPG battery's life depends on the physician programmed settings and how often you use it. It is the technician's job to find out which settings suite you best and give you the longest pain relief for the shortest stimulation time.

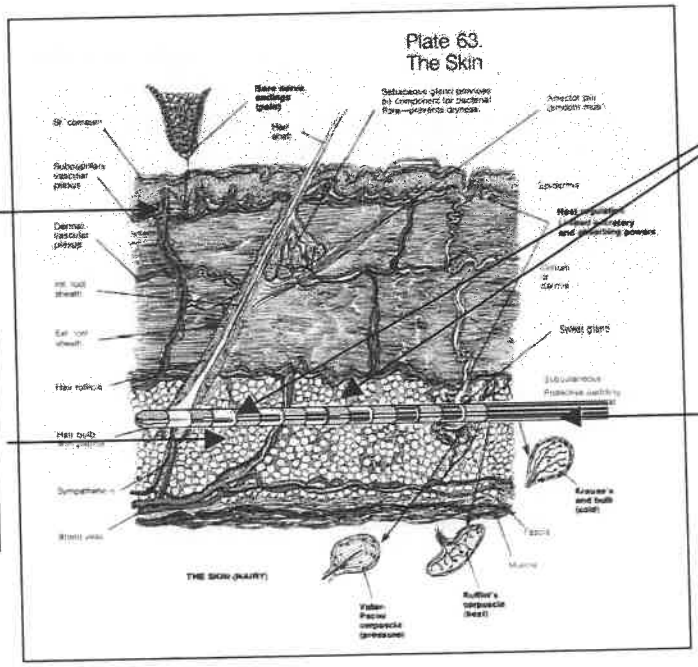
If a Radio Frequency PNS system needs to be used then battery life is not an issue, the external transmitter uses rechargeable batteries similar to mobile phone technology.

WHEN SHOULD PNS NOT BE USED?
Peripheral nerve stimulation should not be used in patients with demand-type cardiac pacemakers. Patients that are unable to operate the system or fail to receive effective pain relief during trial stimulation should no be implanted with the system. Additionally, safety and effectiveness of PNS has not been established for paediatric use or during pregnancy.

WHERE DOES THE ELECTRODE GO?
The electrode is placed just under the skin in the Facia, you will see on the diagram the area under the outer layer and where minor blood vessels run horizontally along is the target area. This region houses the bare nerve endings that transmit sensations; the electrode will create an electrical field that will stimulate these nerve endings.

Target nerves

Lead is inserted into the Facia, nerve endings are stimulated via the electrical field generated.



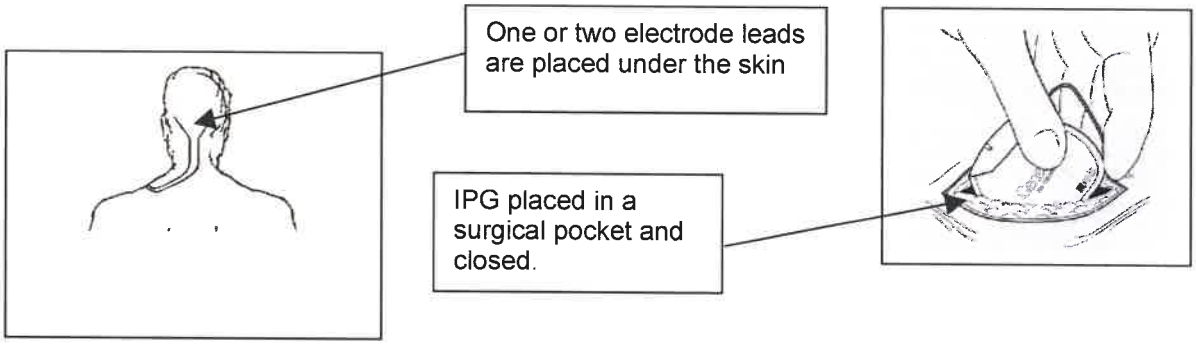
Electrode poles may be activated individually or in groups to create the electrical field.

Electrode Lead

Illustration purposes only not to scale

OCCIPITAL NEURALGIA/ HEAD PAIN

The implantation of PNS electrode is simple and fast, in the case of Occipital Neuralgia some hair is removed so the skin can be prepared and cleaned. Your position on the operating table is face down, with your head and neck extended down onto a support, or lying on your side, with your head extended down toward your chest. You will be made comfortable with pillows, and a relaxant will be given by the Anaesthetist. Local anaesthetic is placed at the back of the skull above the neck region. In this area a needle is placed just under the skin, into this the electrode is inserted and needle removed leaving the electrode in place. The electrode is then connected to a sterile extension, the lead and extension connector are buried within the wound. The end of the extension is then tunnelled out through the skin, and the wound closed. The end of the extension is now connected via a cable to a small battery powered controller. Stimulation will be applied slowly and evenly by the technician, you will be asked to tell when you feel stimulation and if it is in the area of pain. When this happens the electrode is secured with a stitch, and taped down for the length of the trial. The trial lead is usually removed after several days. Once we have assessed the usefulness of the technology.
During the trial your technician will visit you most day's, to check your wounds and adjust the device to see if an electrical combination can be found which will cover your pain region better.
Wound pain is inevitable, PNS wounds are small and superficial, post operative pain relief can be prescribed by the doctor.



OCCIPITAL NEURALGIA/HEAD PAIN
FULL IMPLANT

If the trial was successful, a permanent electrode lead is placed and tunnelled around and over the shoulder blade. A small pocket is made in the top of the chest to accommodate the IPG, the lead is connected and the pocket closed.
You will have post operative pain from the surgery; this is normal. You doctor can prescribe post operative pain relief. Please note, your PNS does not effect or help incision pain.
You will communicate with the IPG via a portable programmer; this is around the size of a cigarette pack, the technician will down load your programs that were discovered during the trial, you will be able to change programs up to 24, increase or decrease your amplitude, or turn the device off and on via your programmer.

OTHER PAIN REGIONS

If you have other pain regions that your doctor has told you PNS may help, such as painful scar's or post surgical pain. The implant technique is exactly the same as occipital neuralgia except the electrode is placed in or near the area of pain. Again just under the skin, if the area is large you may need two electrodes to cover the effected area.

IS THE IMPLANTED DEVICE NOTICEABLE?
If depends on your body shape and size and where the implant is located, However, most patients say it is easy to forget the implanted device is there.

WILL I FEEL THE DEVICE UNDER MY SKIN?
Patients can feel the device, but once the incision heals, most patients say it is easy to forget the implanted device is there. Some patients experience some discomfort in the area of the IPG/RF receiver for some months after implant. This is thought to be a short term reaction to the making of the pocket, and the natural scarring process.

CAN I ACTUALLY CONTROL THE STIMULATION THERAPY
Yes. You will control your treatment with programmer (IPG) or transmitter (RF). The programmer/transmitter lets you turn the stimulator on and off. It also allows you to adjust the intensity of the stimulation to provide sustained pain relief throughout the day.

HOW LONG WILL IT TAKE BEFORE I FEEL BETTER?
Recovery times vary among patients. For instance, incisional pain usually subsides in 10-14 days. However, many say that PNS makes a noticeable difference in controlling their pain from the time of initial activation.

ARE THERE POSSIBLE COMPLICAITONS WITH P.N.S.?
As with any implanted device there is a risk of mechanical complications. PNS is a pain therapy with a low risk of complications. These include the loss of effective stimulation due to the movement of the leads, loss of stimulation coverage due to equipment failure, movement of the stimulation coverage, over stimulation, loss of the pain –relieving effect, or an allergic reaction to the system components. The effect of PNS therapy on pregnancy and nursing mothers has not been studied. You should discuss the risk factors and your concerns with your doctor.

ARE THERE POSSIBLE COMPLICATIONS WITH SURGERY?
As with any surgical procedure, there is a risk of infection and bleeding. However PNS is very simple and represents limited complications. Possible complications may be injury to a peripheral nerve during implantation of the electrode, injury to surrounding tissue or organs during the tunnel procedure, and temporary pain and swelling at the IPG/RF receiver sit due to tissue trauma.

WLL THERE BE RESTRICTIONS ON MY ACTIVITY LEVEL AFTER MY IMPLANT?
Upon placement of your system your activities may be temporarily limited (usually four to six weeks). Depending on where your electrode is placed, that region should be guarded against unnecessary movement and stress. Avoid knocking the IPG/RF receiver site if possible, this may cause a bleed in this area and cause the IPG/RF receiver to become mobile and uncomfortable.

WARNINGS

Diathermy Therapy – You cannot have any short-wave diathermy, microwave diathermy or therapeutic ultrasound diathermy (all now referred to as diathermy) on your body if you have any part of a PNS implanted. Energy from the diathermy can be transferred through the implanted system and can cause tissue damage at the location of the implanted electrodes.

Diathermy is further prohibited because if may also damage the Neuro stimulation system components resulting in loss of therapy, requiring additional surgery for system implantation and replacement. Injury or damage can occur during diathermy treatment whether the neurosutimulation system is turned "On or Off" You are advised to inform their health care professional that you cannot be exposed to diathermy treatment.

Operation of Machines, Equipment, and Vehicles – Do not drive, operate heavy machinery or power tools with the stimulator turned on.

Magnetic Resonance Imaging (MRI)- You should NOT be subjected to an MRI. The electromagnetic field generated by an MRI may dislodge implanted components, damage the device electronics, and induce voltage through the lead that could cause a jolting or shocking sensation.

Theft Detectors and Metal Screening Devices- Certain types of anti-theft devices such as those used at entrances/exits of department stores, libraries, and other public establishments, and/or airport security screening devices may affect stimulation. It is possible that patients who are implanted with non-adjacent multiple leads and/or patients that are sensitive to low stimulation thresholds may experience a momentary increase in their perceived stimulation, which has been described by some patients as uncomfortable or jolting. It is recommended that patients use caution when approaching such a device and request assistance to bypass the device. If they must proceed through the device the patient should turn off the stimulator and proceed with caution, ensuring to move through the detector quickly.

Lead Movement
The implanted PNS lead may move causing stimulation to be perceived in the wrong area, if this happens the lead needs to be surgically repositioned.

Explosive or Flammable Gases- Do not use the programmer in an environment where explosive or flammable gasses are present.

Cardiac Pacemakers – Implanted neurostimulation systems may adversely affect the operation of implanted cardiac demand pacemakers.

Cardioverter Defibrillators – Neurostimulaton systems may adversely affect the programming of implanted cardioverter defibrillators.

Postural Changes – Changes in posture or abrupt movements can change the level of stimulation and potentially cause unpleasant sensations. Turn your IPG off or lower the amplitude before stretching, lifting your arms over your head, or exercising.