



**The Leeds  
Teaching Hospitals**  
NHS Trust

**Leeds Pain and Interventional  
Neuromodulation Service**

# **Peripheral Nerve Stimulation (PNS)**

Information for patients



**Leeds Centre for  
Neurosciences**

This leaflet is to provide information to patients about Peripheral Nerve Stimulators.

**This information leaflet has some very important information about Peripheral Nerve Stimulators (PNS) and it is essential that you read and understand all this information before having a PNS implanted. If you have any questions, please discuss these further with the team (contact information included in this leaflet).**

## What is Peripheral Nerve Stimulation?

Peripheral Nerve Stimulation (PNS) is the stimulation of a peripheral nerve by tiny electrical impulses. PNS works by delivering low power electrical stimulation to the peripheral nerve masking the sensation of pain. PNS systems can be easily and painlessly programmed to best manage your pain. It is used for chronic ('long term') neuropathic ('nerve') pain. It is often used when other treatments such as medication, physiotherapy or injections haven't worked.

Although PNS may allow you to reduce some of your medications it can still be used alongside them. It can be seen as a 'tool' to allow you to revisit treatment options that may have not worked in the past such as exercise or physiotherapy. It may reduce your pain but it will not take it all away.

In the event that you no longer require PNS, the device can be removed.

## How does PNS work?

When you have pain, pain signals are transmitted via peripheral nerves to the spinal cord and then to your brain. PNS is the stimulation of the peripheral nerves that supply the painful area by tiny electrical impulses. The electrical impulses modulate or change these painful signals and when they reach your brain they are often perceived as less painful or potentially painless.

The electrical impulses are delivered through an implanted lead, which is implanted near the peripheral nerve that supplies the painful area, sometimes at a site away from the pain. The lead is a flexible insulated wire, which is powered by a battery (also known as a pulse generator) which is usually worn externally for specified time periods.

The stimulation can be adjusted in terms of strength and area of coverage via an external programming device, by either a nurse from the Pain Team or a representative from the PNS Company when you attend the clinic. You may also be able to make some changes to the stimulation yourself by using your own programmer.

## Will PNS work for me?

Unfortunately Peripheral Nerve Stimulators do not work for everyone. There is approximately a 60-80% chance of a PNS providing you with on average of a 50% reduction in your pain. This also means that there is around a 20-40% chance it will not work for you. PNS will only work for neuropathic ("nerve") pain. Your Consultant will have already assessed some or all of your pain as being neuropathic. However, some patients have "mixed" pain.

By this we mean you may have some mechanical pain, for example muscular pain or pain from other conditions such as fibromyalgia. The PNS will not help with these types of pain.

## Equipment Overview

The PNS system usually consists of an implanted lead, external battery and programmer.

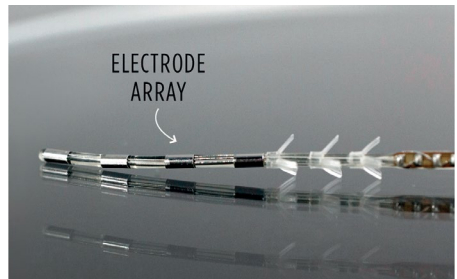
**\*Please note the images in this leaflet may not represent the PNS equipment for your particular system and are just examples. Each type of PNS may look different and may have different components.**

## Internal Components

### Lead

PNS leads are special insulated wires designed to deliver electrical stimulation to peripheral nerves. At the end of the lead is a set of small metal contacts through which the electrical stimulation is delivered to the nerves.

By activating these contacts, we are able to deliver the electrical impulses to the peripheral nerve, this is what we refer to as a 'program'. At the end of the lead is a receiver that allows the electrode to communicate and receive power from the external battery (pulse generator).



*Image of PNS implantable lead*

## External Components

### Battery

The PNS has an external component (battery) to control it. This is often worn on the skin, sometimes held in place by a belt, over the skin where the lead is placed. It is programmed by either the nurses or company Representative in clinic.

The length of time you need to wear your battery may vary and will be discussed with you in more detail.

### *Images of the external component (battery)*



**\*It is really important to understand how the battery will be worn and where on your body and the impact on your daily life this may have.**

## **Programmer used in clinic**

The clinician programmer allows the Pain Nurse or company representative to adjust your PNS and provide you with some programs to try at home to see if they are helpful for your pain.

Usually you will need to be in clinic to have your battery reprogrammed. The programmer communicates with your battery. Sometimes a representative from your PNS company may be present in clinic to program your PNS.

## **Patient Programmer/handset**

The company Representative will show you how to use the stimulator battery.

You can use the patient programmer to switch your system on and off and to check or change which program you are on if necessary.

The stimulator is likely to be activated (switched on) and the team will show you how to use it at a separate appointment to the date of implant, usually about 2 weeks post operation.

If you are unsure how to use your device please refer to the information you are given after your implant. If you are still having difficulties, please call the Pain Nurses for further advice.

The battery of the PNS will need to be recharged, this is usually done by a cable that is plugged into the device. The Nurse Specialist or Representative will show you how to do this.

## Implant Procedure

Before the surgery, you and your Consultant will discuss the procedure and they will answer any remaining questions you have. The procedure will be performed in an operating theatre whilst you are awake, but local anaesthetic and sedation will be available for comfort.

The lead is placed close to the specific peripheral nerve and ultrasound or X-Ray is often used to assist placement. It may be necessary to stimulate the electrode in the operating theatre to confirm placement and this will be performed by the PNS company representative. They will apply an electrical stimulus to the electrode and you will describe whether you feel a tingling sensation and where, this is not painful. The lead is anchored in place to reduce the risk of it moving. Any small surgical incisions that have been performed will be closed using sutures and/or glue, you will then be taken to the recovery unit and then to the ward.

## After the Procedure

After the procedure, a company representative may visit you on the ward but usually the stimulator is not programmed on the day of implant. An appointment will be arranged with you to have your device programmed and switched on at a later date.

You are likely to experience some pain or discomfort around the wounds for at least a few days and sometimes a few weeks after your procedure. Your GP can prescribe some painkillers to help with this pain if necessary. It is important you check your wounds daily for any signs of infection or ask a friend or relative to do this for you.

**If you have any sudden swelling, pain or redness or leaking blood or pus from your wounds please refer to the discharge advice you have been given. If you are concerned about your wound please seek medical advice immediately.**

**It is important to also contact the Pain Nurses to let them know if you have any problems with your wounds.**

We may ask you to avoid certain activities following your PNS implant, though it is important to try and maintain your normal activity level. Please discuss this with your Consultant before discharge.

## **Reprogramming**

You may have several programs on your PNS handset when you leave hospital. Please follow the instructions about how and when to trial these in order to find which is most beneficial for you. Please don't rush as it takes time to work out what works best.

Sometimes the stimulator is set to give a tingling sensation whilst it is switched on. Other programs are set so that you cannot feel any stimulation. Please check with the nurses or company representative as to which type of program you have.

If you have been told that you have a program that you should not be able to feel and you can feel 'tingling' or any different or new sensations (different to 'normal'), you may be advised to use your patient programmer to turn the stimulator down or change programs. This may be caused by overstimulation. This is important, as overstimulation can aggravate your pain and make it worse.

If you do not know how to do this or have any concerns, please ring the pain nurses for advice.

## **Additional information**

### ***Magnets***

Your PNS can be turned on and off by close contact with magnets. This is a safety feature, however other magnets such as those on bags and wallets, children's toys etc may all turn your PNS off unexpectedly.

### ***Surgery with a PNS***

If you require surgery once you have had a PNS implanted, there may be certain precautions that your Surgeon may need to consider, for example some of the equipment (e.g. diathermy) used during surgery may be restricted and your PNS will need to be switched off during the procedure. It is important that you let the team carrying out the surgery know in advance that you have a PNS implanted. You can contact the Pain Team for further advice.

### ***MRI scans***

Due to the metal components of a PNS, there are restrictions with regards to having MRI scans. If you are told that you need an MRI and you have a PNS implanted, please make sure the referring person and MRI Department are aware you have a PNS prior to the date of the MRI.

Checks will need to be made prior to the MRI scan being booked and there may be certain things that are needed on the day. There are also some types of PNS where by you cannot have an MRI scan at all. If you require routine MRI scans, it is important that you let the team know before you have a PNS implanted.

## ***Alarms/airports***

Once you have your stimulator implanted you will be given a card to show to airport staff to say that you have an implanted medical device. This means they may be able to make alternative arrangements with regards to metal detectors. We advise that you keep your patient programmer in your hand luggage so you can check or adjust your PNS during your journey. Please ask the nurses if you have not received one after implant.

## **Significant, unavoidable or frequently occurring risks**

There are risks and complications with having a PNS. The serious risks are rare.

### ***Risks include***

- Your pain may not reduce.
- You may have a reaction to the stimulator components.
- You may have bruising and pain where the operation has been performed.
- You may have an infection at the wound sites.
- You may have a serious infection of your nervous system.
- You may have a serious injury to your nerves causing permanent weakness or an increase in pain in the area supplied by a nerve.
- You may have damage or breakage to some of the stimulator which cannot safely be removed.
- You may need to have further surgery to either help with any of the issues above or replace the device as it ages.

These will all be discussed in more detail at your information session with the pain nurses and with your Consultant. If you have any queries with regards to the risks, please discuss it further with the team.

## What happens next?

After you have had your Information Session your case will be discussed in our multidisciplinary team meeting. From there, if you are deemed suitable for a PNS you will be added to our waiting list, waiting times may vary.

You will then have an appointment with a pre-assessment nurse and one last appointment with your Consultant which may be over the telephone. This will give you the opportunity to ask any questions or discuss any concerns you may have.

If you have any queries with regards to waiting times, please contact the administrative team - please see page 12 for their contact details. If you have already had your Information Session, we hope you have found it useful and informative. If you have not, you will need to have an Information Session with the pain nurses and this may be face to face or via video link. It is very important that you understand about the risks and benefits of PNS and about what having a PNS involves. If you have any more questions or concerns please contact the Pain Nurses (contact details on page 12).

Alternatively, there is further information available on our website. You will also have the opportunity to ask your Consultant any questions during your final check appointment and you will receive an appointment letter through the post for this.

## Contact us

- Consultant appointments or queries
  - Telephone: **0113 392 3495** or **0113 392 2090**.
- Pain Nurse Specialists  
(Including queries regarding nurse appointments)
  - Telephone: **0113 392 2178**  
Please leave your name, phone number and your NHS number. Nursing service is Monday - Friday 08.00 - 16.00
  - Email: [leedsth-tr.chronicpainnurses@nhs.net](mailto:leedsth-tr.chronicpainnurses@nhs.net)

## When you go home it is important that you seek a medical review if you experience any of the following signs/symptoms

Redness, pus, tenderness or excessive swelling or pain at any of your wounds. You will need to be assessed by the Pain Team or at your GP Practice on the same day or please attend A&E if you are feeling unwell.

Take this leaflet with you, there is an on-call Chronic Pain Consultant, who medical professionals can contact through the hospital switchboard for advice if required.

**IMPORTANT** - These problems may happen up to 4-6 weeks after your operation.

Please also contact the pain nurse specialists as well as seeking medical advice in A&E.

**What did you think of your care? Visit [bit.ly/nhsleedsfft](https://bit.ly/nhsleedsfft)**  
***Your views matter***

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Developed by: Jenny Jennings - Team Leader - Chronic Pain & Neuromodulation

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