

Transcutaneous electrical nerve stimulation (TENS) in children

Information for families

Great Ormond Street Hospital
for Children NHS Trust

This information sheet explains about the use of transcutaneous electrical nerve stimulation (TENS) in children, how it works and what to expect when the Pain Control Service at Great Ormond Street Hospital (GOSH) suggest it for your child.

What is transcutaneous electrical nerve stimulation (TENS)?

TENS is a safe, easy to use, drug-free method of managing pain.

A very low level electrical current is applied to areas of the body using soft gel pads that stick to the skin. "Transcutaneous" means through the skin. The low level electrical current stimulates nerves in the body that help to reduce pain.

How does TENS work?

There are millions of nerve cells in the body, each of which carries signals through the spinal cord and up to the brain. As well as pain, nerve cells carry signals about touch, temperature and pressure. TENS is thought to work by blocking pain signals from pain-sensing nerves by overwhelming them with gentle input from touch and pressure-sensing nerves. This causes fewer pain signals to reach the brain and the child or young person feels less pain.

Can anyone use a TENS machine?

Although TENS machines can be bought from most chemists, children should only use a TENS machine on the advice of their doctor. In addition, children should **not** use a TENS machine if:

- They have a pacemaker or implantable cardioverter defibrillator (ICD)
- They have epilepsy
- The source of pain is over the site of any previous surgery where internal metalwork, such as screws, wires, implants or metal plates have been inserted.
- They have poor sensation in the area where the electrodes are to be applied

If you have any questions about the suitability of TENS for your child, please discuss this with your doctor or pain control nurse specialist.

Please note: the TENS machine has been provided for your child. It should not be used by anyone else.

Does TENS have any side effects?

The main reported side effect has been a mild reaction to the adhesive on the electrode pads. At GOSH, all the pads we recommend are 'hypoallergenic' so less likely to cause a reaction. If skin irritation occurs, please discuss this with the Pain Control Service as there are various options for reducing irritation.

Does TENS work for everyone?

Many children and young people using a TENS machine report that it has helped to relieve their pain, however, this varies from person to person. Unfortunately using TENS will not benefit every child. Generally it takes a couple of hours of using TENS for the first time, before the effect is felt. You should still give your child his or her regular pain medicines while using the TENS machine. Over time, if the TENS machine is helpful; your child may not need pain relief as frequently as before.

Your child's TENS machine kit

The TENS equipment consists of a lightweight machine that the child or young person carries around with them, fastened to a belt or in a pocket. The machine is attached to the patient using leads connected to sticky electrode pads, which are placed on the skin, either around the painful area or on areas on the back where the nerve path passes into the spinal cord, connecting the painful area to the brain. The machine sends gentle electrical pulses through the electrodes, which are then picked up by the nerve cells, blocking the pain signals travelling to the brain.

There are many TENS machines that can be helpful in reducing a child or young person's pain. The type of TENS machine currently used at GOSH is the PhysioMed® TPN 200 plus machine (pictured). Your child's pack should contain:

- PhysioMed® TENS machine
- Battery 9 volt (6F22)
- Packet of 4 adhesive electrode pads
- Two lead wires
- Instruction manual
- Order form for new electrode pads

Please let us know if anything is missing. If your child's doctor feels that a TENS machine would be helpful, we will loan one to you. We will ask you to sign a form agreeing to use the machine only as instructed and to return it when requested. We will also note the identification number of the machine you are given.



Programming your child's TENS machine

Before you go home with the TENS machine, the nurses will explain how it is programmed. The standard settings you should use for your child are as follows:

- Setting (Mode)
= Normal (N)
- Pulse width (duration)
= 70 to 120
- Pulse rate (frequency)
= 70 to 120

If your child is advised to use different settings to these, your nurse will note them on the back page of this information sheet. The pulse width and rate can be increased over time if your child becomes tolerant to the initial settings. We recommend that you do not alter the mode from 'normal' unless advised by your doctor or nurse. The other modes are designed for adult use so may cause unpleasant sensations for your child.

Setting up and attaching the machine

1. Always check that the machine is switched off before starting
2. Put the battery in the TENS machine by pulling back the sliding lid – the battery may already be inserted
3. Plug the leads into the electrode pads and attach the leads to the machine
4. Make sure that the area of skin where the electrode pads will be placed is clean and dry
5. Remove the plastic covers from the electrode pads
6. Apply the electrode pads to the areas as you have been shown – the electrodes must not be touching, and should be at least one pad's width apart
7. Switch on the TENS machine and gently turn up the dial until the sensation through the electrode pads is strong but comfortable. Your child should feel a gentle tingle or buzzing sensation.
8. If the sensation is not in the right place, switch off the machine before re-positioning the electrode pads.

Please note: your child should be the only person turning the dial to increase the signals

Positioning the electrode pads

Generally, we will ask you to position the electrode pads at the site of the pain, but sometimes we will ask you to place them over the nerve pathway supplying the painful area or over acupuncture points.

Positioning the electrode pads at the site of the pain:

The most common way to position the electrodes is by placing them directly at the site of the pain. The pain control nurse specialist or doctor will discuss with you where to position the pads and this can then be marked on the body diagram which can be found on the back page of this leaflet. If at any stage you feel that the sensation is not in the right place then switch off the machine and reposition the pads.

Positioning the electrode pads on a nerve pathway supplying the painful area:

In this technique, the TENS electrode pads are placed on the back over the main nerve supply areas of the body (dermatomes). In this way pain messages from specific areas of the body can be blocked. This method of using TENS is very useful if your child finds it too uncomfortable to have the TENS pads applied to the skin in the painful area of their body. The pain control nurse specialist can show you how to identify the correct positioning of the pads when using this technique and will then mark this on the body diagram which can be found on the back page of this leaflet, for use at home.

Positioning the electrode pads using acupuncture points:

There is also a technique whereby pain relief can be achieved by using a TENS machine to stimulate specific acupuncture points on the body. The pain control nurse specialist can tell you if this method is suitable for your child.

Please note that the electrode pads must not be placed over the front of the neck (carotid sinus) or over broken or infected skin.

We recommend that your child uses the TENS machine for at least one hour and up to a few hours at a time. He or she can move around as usual while using the TENS machine. It is important to keep to normal daily routines wherever possible. Your child should not use the TENS machine while having a shower or bath. The electrode pads should be removed before going to bed, as they may fall off or move during the night. If your child needs the TENS machine to get to sleep, you must switch it off once he or she has fallen asleep.

If your child is using the TENS machine for several hours a day, we suggest changing the position of the electrode pads from time to time to stop the skin becoming sore. The electrode pads will last for around 30 uses before they need to be replaced.

Turning off the machine

1. Switch off the machine by turning the dial on the top of the machine to the OFF position.
2. Remove the electrode pads from the skin and place them back on the plastic sheet
3. Unplug the leads and store them with the electrode pads in the bag provided
4. Store the TENS machine in the holder provided
5. If needed, wash the area where the electrode pads were placed with soap and water

Trouble shooting

What if ...	Action
There is no or low sensation under the electrodes	<ul style="list-style-type: none">■ Try replacing the battery – it may be worn out
The electrode pads do not seem sticky any more (if stored correctly on the plastic sheet between use, each set of pads should remain sticky for up to 30 applications)	<ul style="list-style-type: none">■ Switch off the machine■ Try moistening the pads with a well rung out lint-free damp cloth, such as a cotton handkerchief. Ensure there is no visible moisture on the pads before reapplying to the skin
My child feels burning under the electrode pads	<ul style="list-style-type: none">■ Check the area of skin under the pads for redness and sensitivity. If red do not reapply■ The electrode pads may have lost their stickiness and may be only partially attached to your child's skin. Wipe the pads with a well rung out lint-free damp cloth such as a cotton handkerchief. Ensure there is no visible moisture on the pads before reapplying to the skin■ The electrode pads may be worn out so replace them with new ones■ The intensity may be too high so try reducing it until your child feels a mild tingling sensation

What if ...	Action
<p>One of the plugs or leads is loose or broken</p>	<ul style="list-style-type: none"> ■ Switch off the machine immediately and replace the lead with spare if available. Do not reuse broken lead. ■ Contact the Pain Control Service for a replacement plug or lead
<p>My child seems to be allergic to the electrode pads and has developed a rash in that area</p>	<ul style="list-style-type: none"> ■ Remove the pads ■ Certain skin types can be sensitive to the adhesive on the electrode pads, however, all the pads we recommend are 'hypoallergenic' so less likely to cause a reaction ■ If skin irritation continues, please contact the Pain Control Service as there are various options for reducing irritation.

TENS machine settings for your child

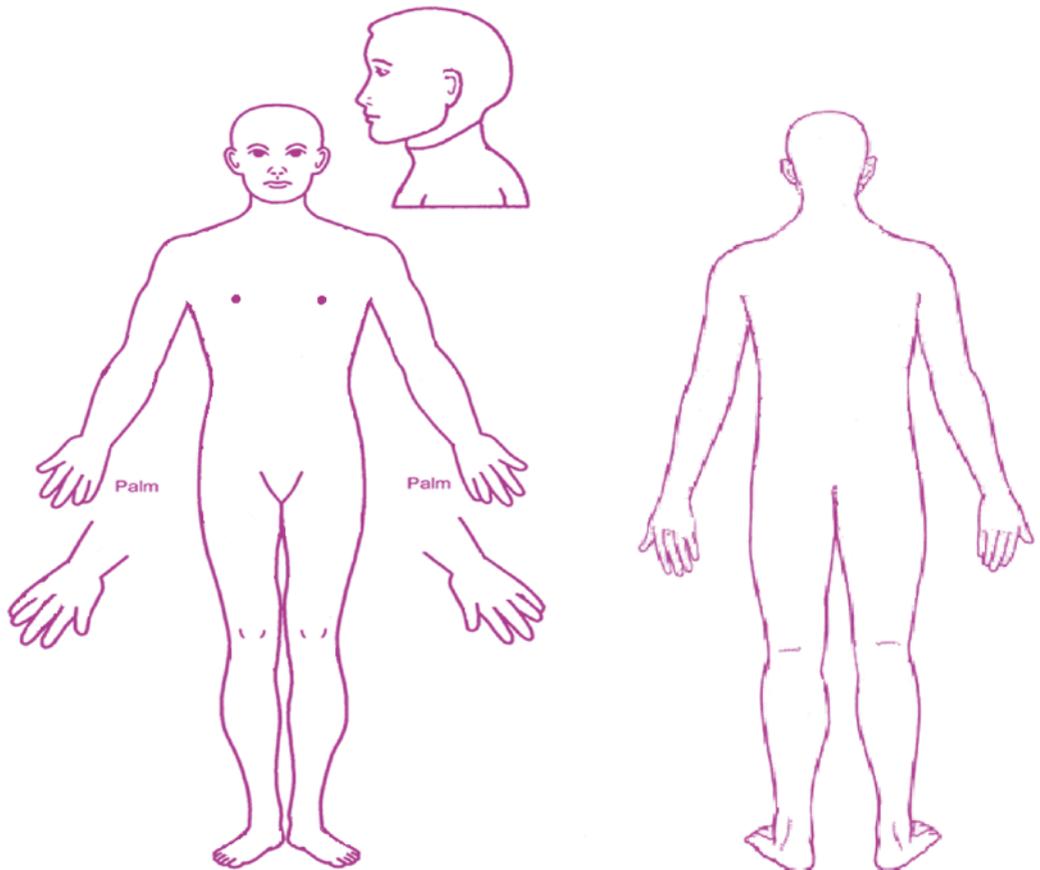
Setting =

Pulse width =

Pulse rate =

Mode = N(ormal)

Positioning of electrode pads



Notes

Notes

**If you have any question, please contact the
Pain Control Service on 020 7405 9200 ext 5940**

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in collaboration with the Child and Family Information Group

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