

TENS: Transcutaneous Electrical Nerve Stimulation

Key Points

- TENS stands for Transcutaneous Electrical Nerve Stimulation
- It is a drug-free therapy that can be helpful in reducing many types of pain
- The pain relief benefits of TENS therapy are comparable to or better than massage, acupuncture, heat packs, over-the-counter analgesics and muscle relaxants¹
- Following medical diagnosis and advice, TENS can be self-administered at home and on demand
- You might be more comfortable hiring a unit at first - you can always purchase it later

What is Transcutaneous Electrical Nerve Stimulation?

Transcutaneous Electrical Nerve Stimulation (TENS) is the application of a low voltage electrical current, through electrodes placed on the skin.

It is a pain relief therapy that activates non-painful sensory nerve fibres to create a tingling sensation, which may help you feel less pain.

A TENS machine is a small medical device that is used to administer the TENS therapy. It consists of a control unit, an electrical lead and gelled pads, which stick to the skin and act as the electrodes.

What are the benefits of TENS therapy?

TENS therapy for pain relief has potential benefits relating to: effectiveness, comparative safety, availability, convenience, simplicity and cost.

It is a non-invasive mechanism for pain relief and there is no risk of overdose, toxicity or addiction.

It also reduces tension, which can help patients increase movement and physical function.

Therapy is available on demand and may be administered at rest, during activity or while sleeping - helping you feel in control and empowered.

Who can use TENS?

TENS can be used as a method of pain relief or as an adjunct to pharmaceutical medications or therapies, and is suitable for patients with various types of diagnosed pain.

There is some clinical evidence to support TENS for the relief of pain associated with the following medical conditions²:

- Chronic pain - osteoarthritis, rheumatoid arthritis, musculoskeletal pain, soft tissue disorders, joint disorders, fibromyalgia, sciatica, carpal tunnel, repetitive strain injuries
- Acute pain - sprains, strain and tears of muscles, ligaments and tendons, post-operative pain, lacerations, fractures, hematomas, contusions, dental procedures, period pain, child-birth
- Neuropathic pain (peripheral) - nerve compression, diabetic neuropathy, post herpetic and trigeminal neuralgia, chemotherapy induced peripheral neuropathy
- Neuropathic pain (central) - post-stroke pain, multiple sclerosis, spinal cord injury
- Miscellaneous - tension headache, muscle tension and wound pain



When not to use TENS?

TENS should not be applied in the vicinity of an active malignancy, through the brain or heart, over the carotid artery, with epilepsy, through the uterus of a pregnant woman and in the vicinity of a cardiac pacemaker or defibrillator.

How does TENS work?

Both pharmacological and electrical pain relieving treatments act by reducing activity in the pain sensing system of the body.

TENS therapy can help manage pain by activating sensory nerve fibres at both the peripheral and central regions of the nervous system.

At the peripheral level, TENS activates fast transmitting, non-painful sensory nerves in a mechanism called "gate control".

By travelling more quickly, non-painful sensory input reaches the base of the spinal cord before the slower moving pain signals. The pleasant input competes with and prevents the painful input from travelling to the higher, pain-sensing regions of the brain.

This gate control theory applies to some extent to other methods of sensory input; e.g. heat and cold packs, massage and acupuncture.

At the level of the central nervous system, TENS therapy can help reduce pain in the following ways:

- The release of the natural opioid, β -endorphin
- The release of other pain inhibiting chemicals such as serotonin
- A reduction of several chemicals that would otherwise elevate painful sensations

In recent years clinical studies looking at brain images have shown pain inhibiting activity in the central cortex when TENS therapy was applied.

However, TENS therapy is not for everybody. Its effectiveness is based on a range of factors and you will need to try it to see if it is the right treatment for you.

What are the issues to consider?

TENS therapy is not a substitute for adequate diagnosis, ongoing medical supervision or illness management.

The most effective way to use TENS is in the context of a multidisciplinary pain management approach, which addresses the physical, psychological and environmental or social factors that influence your experience of pain.

If you are unsure about using TENS, ask a therapist or retailer for a demonstration. It is easy to learn and easy to use. You can also look for an option where you can hire and trial a machine at home.

Other factors to consider when hiring or buying a TENS machine include:

- Clear instructions for use are essential - look for program, time, placement of pads
- Signal comfort is everything - if not well designed or manufactured, erratic signals can cause discomfort
- Intensity control is important - highly adjustable is good
- Size of the control unit may be important for you - small and light means added mobility and convenience
- Maintenance and replacement pads - if they are included, this will save money in the long term

How can I try TENS therapy?

Many physiotherapists, pain management specialists and massage therapists use TENS therapy in their clinics. Some will also advise you how to administer the therapy yourself and where to hire or purchase your own TENS machine.

If you already know that TENS therapy is helpful to you, machines are available direct from the manufacturer or resellers - online or by phone. BUT do check that the supplier is registered with the Therapeutic Goods Administration. Some basic, imported machines "fly under the radar" and therefore quality cannot be assured.

References

- 1 "TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS)"; CHAPTER 8, PAGE 169. Mark I Johnson, Professor of Pain and Analgesia at Leeds Metropolitan University, Oxford University Press, 2014
- 2 "TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS)"; CHAPTER 8, PAGES 151-168. Mark I Johnson, Professor of Pain and Analgesia at Leeds Metropolitan University, Oxford University Press, 2014
- 3 "TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS)" CHAPTER 9 Mark I Johnson, Professor of Pain and Analgesia at Leeds Metropolitan University, Oxford University Press, 2014 AND "ELECTROTHERAPY EXPLAINED - PRINCIPLES AND PRACTICE"; FOURTH EDITION. Val Robertson, Alex Ward, John Low and Ann Reed, Butterworth Heinemann, 2006 AND "EFFECTIVENESS OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION FOR TREATMENT OF HYPERALGESIA AND PAIN". Josimari M. DeSantana, PT, PhD, Deidre M Walsh, PT, PhD, Carol Vance, PT, MSc, Barbara A Rakei, RN, PhD and Kathleen A. Sluka, Pt, PhD Curr Rheumatol Rep. 2008 December; 10(6): 492-499