

Transcutaneous Electrical Stimulation

Principles and Theory

Transcutaneous electrical nerve stimulation (TENS) is a noninvasive therapeutic modality used to reduce acute or chronic pain from various causes. It acts through pads placed on the skin around the affected area, sending small electrical impulses to the underlying nerve fibers. TENS regulates or decreases the intensity of signals carried by nerve fibers such as touch, warmth, pressure, and pain. TENS is by far the most recognized type of electrical stimulation

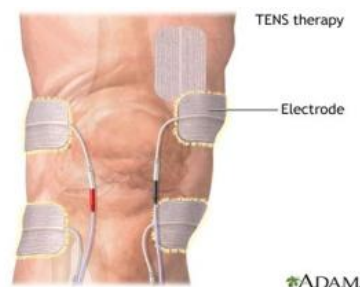


Photo from www.clarian.org/ADAM/doc/CareGuides

TENS can work in two ways,

- TENS can "**block**" the arrival of painful messages from reaching areas of the brain that interpret pain (Sensory analgesia). In this form, TENS can be used all waking hours of the day to decrease pain.
- TENS can "**stimulate**" nerves to release endorphins, which are your own natural painkillers (Endogenous opiate). In this form, TENS can be used in 30-45 minute increments.

Intended Outcomes

- Control chronic and acute pain from disease or dysfunction.
- Assist with treatments of repair and improved body mechanics by producing analgesia during the procedures of strengthening and range of motion exercises.

Common Conditions, Functional Impairment Treated

TENS is primarily used to treat pain. Sources of pain can include but are not limited by; chronic or acute, range of motion, muscle, congenital defects, or disease.

What the Patient/Client Can Expect to Feel or Experience

The sensation experienced from TENS depends on the settings used. Sensations can range from no apparent change to slight pricking to serious

nerve discomfort. The typical feeling is tingling, buzzing, or pulsing. To gain maximum benefit the sensation should be strong but not painful. Forceful muscle contraction should be avoided.

Safety	Precautions	Contraindications
Inspect equipment regularly	Obesity	Cancer
Refer to pictures and instruction guide	Directly over open wounds or damaged skin	Pregnancy (except in labor)
Use in safe location and surroundings. Do not use when sleeping	Certain skin conditions, such as dermatitis	Certain implanted devices, such as a pacemaker
Do not get the TENS machine or leads wet	Monitored use for patients with cardiac disease or arrhythmias	Over carotid sinus
Clean skin prior to applying electrodes	Directly over the spinal cord	Loss of or decreased sensation

Additional information can be provided by your physical therapist, physical therapist assistant, primary physician, or sources listed below.

1. Pagliarulo, Michael A.. *Introduction to Physical Therapy, 3rd Edition*. C.V. Mosby, 082006. 9.7.1.2.
2. Cameron, Michelle H.. *Physical Rehabilitation: Evidence-Based Examination, Evaluation, and Intervention*. W.B. Saunders Company, 032007. 7.5.2.4.
3. Behrens, Barbara J, and Susan L Michlovitz. *Physical Agents: Theory and Practice*. Philadelphia: F.A. Davis, 2006.
4. Davis, L. Dana, and Susan Spinasant. "Transcutaneous Electrical Nerve Stimulation (TENS)." *Spine universe.com* 6 Feb. 2010. Everyday Health Network. 17 Feb. 2010<<http://www.spineuniverse.com/treatments/physical-therapy/transcutaneous-electrical-nerve-stimulation-tens>>

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