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The Usefulness of Transcutaneous Electrical Nerve Stimulation for the Management of Chronic Low Back Pain

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CAT Format

Title: The Usefulness of Transcutaneous Electrical Nerve Stimulation for the Management of Chronic Low Back Pain

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Clinical Scenario: A 60-year-old male patient who was referred to physical therapy for chronic low back pain, dating back to his years in the military. The patient is healthy overall and presented with a mild limp, using a single point cane for assistance ambulating. He reported that he has tried "everything" for his low back pain, including: yoga, pool therapy, medications, manipulations by a chiropractor and previous visits to physical therapy. Clinical Evidence was needed to determine if the patient may benefit from a take home TENS unit to manage his low back pain.

Clinical Question: Is transcutaneous electrical nerve stimulation useful for management of chronic low back pain in healthy adult patients?

Patient/Problem – Healthy adult patients with chronic low back pain

Intervention – Transcutaneous Electrical Nerve Stimulation

Comparison – None

Outcome – Management of chronic low back pain in healthy adults

Clinical Bottom Line: The findings of this search are applicable to this patient case because the following article looked at four quality randomized control trials that compared the effects of TENS and a placebo on the management of chronic low back pain in healthy adults. This study looked at how TENS affected pain levels, functional status, general health and work disability, which is important to the plan of care and goals for my patient. After reviewing the results, they do not support my plan to use TENS for the management of chronic low back pain. Only one of the four randomized control trials found positive

results and one study found negative results. I will most likely need to change my plan of care based on these results.

Search History:

Databases/Sites Searched	Search Terms	Limits Used
-Medline-PubMed -Medline-EBSCO - CINAHL - Cochrane Database of Systematic reviews - Ptjournal.org	- TENS - Chronic - Low back pain - Adults - Healthy - Placebo	Full text articles Humans Systematic Reviews Meta-Analysis Randomized Control Trials

Citations: Khadilkar A, Odebiyi DO, Brosseau L, Wells GA. Transcutaneous Electrical Nerve Stimulation (TENS) Versus Placebo for Chronic Low Back Pain (Review). *Physical Therapy [serial online].* April 2013; (5) 1-55. Available from: Cochrane Database of Systematic Reviews with Full Text. Accessed October 28 2014.

Summary of Study:

Study Design: This study done by Khadilkar, Odebiyi, Brosseau and Wells was a systematic review that looked at randomized control trials to see if transcutaneous electrical nerve stimulation (TENS) is more effective than a placebo in the management of chronic low back pain in healthy adults. This article is the most recent update of the original version that was published in 2005. Chronic low back pain (LBP) is the leading cause for work absenteeism and visits to healthcare professionals. When it comes to treatment of chronic LBP, TENS is a popular intervention because it is safe, non-invasive and can be used by the patients at home. The goal of this study was to find out if the use of TENS is more effective than a placebo in management of chronic LBP.

Setting: This study was conducted in an outpatient setting.

Participants: Randomized control trials with more than 5 LBP patients in a treatment group were eligible. Participants included outpatients, aged 18 years and over with chronic low back pain lasting longer than 12 weeks. Patient's with symptoms of sciatica or a history of back surgery were not excluded, but were required to be a minority. Patients were excluded if they had malignancy, infection, fracture,

inflammatory disorder or a neurological syndrome. Also, trials were excluded if they had a mix of chronic and acute low back pain, unless the data was presented separately.

Intervention: They reviewed four high quality randomized control trials of high methodological quality, meeting six of the eleven methodological criteria with a total of 585 patients. The literature review ranged up to July 19th 2007. Electronic databases included: The Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, PEDro and CINAHL

Outcome Measures: Outcome measurements were taken from a set of recommended instruments. They included pain, back-specific functional status (Roland Morris Disability Scale or Oswestry Disability Index), general health status, work status and patient satisfaction.

Data Analysis: There was no cut-off based on methodological quality. With each included trial, they collected information about the study design, population, treatment characteristics, application method, schedule, outcomes and adverse effects. Data from the outcome measurements were pooled to arrive at an overall estimate of the effectiveness of TENS. If trials reported outcomes as graphs, the mean scores and standard deviations were estimated from the graphs.

Summary of Evidence: This study focused on several outcome measures. The first was pain intensity. Three of the four randomized control trials studied used the visual analogue scale (VAS) for pain and all three were considered high methodological quality. Two of the three studies (Cheing 1996; Deyo 1990) were found to have statistically insignificant and clinically unimportant benefits at the end of two weeks and four weeks of treatment. However, the third study demonstrated both statistically significant and clinically important benefits after two weeks of treatment with conventional TENS (MD-21.80; 95% CI-33.08 to -10.52).

Regarding back specific functional status, two of the four studies reported using different, but valid scales (The Oswestry Disability Index & Roland-Morris Disability Questionnaire). The study by Topuz 2004 revealed no statistically significant or clinical importance of the use of TENS with the Oswestry Disability Index or Low Back Pain Outcome Scale. Jarzem 2005 using the Roland-Morris

Disability Questionnaire observed no statistically significant or clinically important effects of conventional TENS.

General health status was observed in two studies, using the Modified Sickness Impact Profile (Deyo 1990a) and the SF-36 (Topuz 2004). The study by Deyo 1990a showed no statistically significant effects on the Modified Sickness Impact Profile, while the study by Topuz 2004 showed statistically significant effects on only 2 of 8 subsections for the SF-36. Overall, based on the studies TENS effects on generic health status is under debate. Work status was also assessed, but only in one study. Jarzem 2005a used the McGill Work Scale, which found no have no significant differences between TENS and the placebo.

Overall, this study found TENS to be no more effective than a placebo for management of chronic low back pain in healthy adults. One of the four trials reported adverse effects from the use of TENS. These adverse effects demonstrated were minor skin irritation over the site of the electrode, which was experienced by about a third of the subjects. Also, severe dermatitis occurred four days after the start of therapy in one patient and the patient was forced to withdraw from the trial.

Additional Comments: This study is a systematic review, which is considered the gold standard and highest level of evidence. Also, the four randomized control trials used were rated as high methodological quality, meeting six of eleven criteria for high methodological quality. However, this systematic review has several limitations that should be considered. First, there were only a small number of eligible trials (4) to draw conclusions about the use of TENS for management of chronic low back pain in healthy adults. Additionally, the outcome measures reported were not consistently reported in each trial, which makes it difficult to compare the studies. It was reported in the study that the criteria used to define clinically important differences in outcomes between TENS and the placebo are evolving and should therefore be interpreted with caution. The evidence of the study was based on changes observed within individual patients and group changes. Ready access to individual patient data was non-existent and therefore they researchers relied on mean group differences to judge clinically relevant outcomes. A major aspect of this study to consider is the clinical relevance. It seems that the clinical relevance is limited because the study

was carried out over one day, with the patients only receiving one or two sessions of TENS. Also, most of the information is over 10 years old, which isn't ideal for current clinical relevance. Overall, caution should be taken when reviewing this piece of literature.

This CAT was completed as part of Scientific Inquiry II (Fall 2014) under the instruction of Sally McCormack Tutt, PT, DPT, MPH