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presents:

REHABILITATIVE USES OF ELECTRICAL STIMULATION

COMMON USES OF E-STIM IN REHAB

- × Increase Range of Motion
- × Increase Muscle Strength and Tone
- × Muscle Reeducation
- × Improve Innervation
- × Pain Control
- × Edema Reduction
- × Decrease Muscle Spasm

TERMINOLOGY

- × **TENS**- Transcutaneous electrical nerve stimulations
- × **EMS**- Electrical Muscle Stimulation
- × **NMES**- Neuromuscular Electrical Stimulation

TECHNICALLY SPEAKING...

- × Almost all electrical stimulators are TENS units as they work transcutaneously through surface electrodes to excite nerves.
- × However, in most rehabilitative situations where the muscles are being innervated by a motor nerve, the term NMES is more appropriate.
- × For this discussion, we'll just use the term E-stim

PRECAUTIONS AND CONTRAINDICATIONS

- × High intensity around the heart
- × Animal with seizures
- × Over anesthetized skin
- × Areas with peripheral vascular disease or thrombophlebitis (may cause release of embolus)
- × Area of neoplasia or infection
- × Over the trunk during pregnancy

PAD PLACEMENT OPTIONS

- × Over the site of the pain
- × Over the nerves leading to/from area of pain
- × Motor/trigger points- one pad is placed over muscle belly, while second pad is placed over muscle insertion point
- × Dermatomes
- × Acupuncture points

USING E-STIM FOR PAIN CONTROL

- × E-stim works on the principle of the Gate Theory for pain control.
- × Painful stimuli (transmitted by the larger, thicker, A-beta fiber sensory nerves) may be prevented from reaching the higher levels of the CNS by stimulating the thinner, excitatory, A-delta and C fibers. Stimulation of these thinner nerves keeps the 'gateway to pain' from opening as easily.

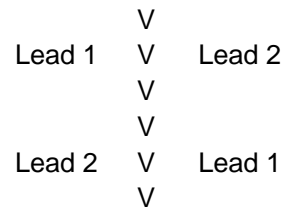
PURPOSE: ACUTE PAIN OR SPASM I

- × Mode: Premod
- × Beat Freq/Hz: 80-150 Hz
- × Cycle time: Continuous
- × Intensity: Comfortable tingling
- × Time: 30 minutes
- × Notes: For a handheld TENS unit, use low pulse duration (2 – 50 μ sec) and 50-100 Hz.

PURPOSE: ACUTE PAIN OR SPASM II

- × Mode: Interferential
- × Beat Freq/Hz: 80-150 Hz
- × Cycle time: Continuous
- × Intensity: Comfortable tingling
- × Time: 30 minutes
- × Notes: Pad placement in "X" pattern across spine (see next slide)

PAD PLACEMENT FOR INTERFERENTIAL



V= vertebra

PURPOSE: CHRONIC PAIN OR SPASM

- × Mode: Premod
- × Beat Freq/Hz: 1-10 Hz
- × Cycle Time: 5/5
- × Intensity: Strong, visible twitch/contraction
- × Time: 30-45 minutes
- × Notes: No more than BID, minimum 6 hours apart. For handheld TENS unit use $>250 \mu$ sec, 2-4 Hz.

PURPOSE: STRENGTHENING

- × Mode: Russian
- × Beat Freq/Hz: 30-50 Hz
- × Cycle Time: 20-30% duty cycle (1:3 – 1:5)
- × Intensity: Strong, visible twitch/contraction
- × Time: 10-20 minutes
- × Notes: 2 – 3 times per week. Place pads on motor points (one pad is placed over muscle belly, while second pad is placed over muscle insertion point)

PURPOSE: REDUCE EDEMA

- × Mode: Premod
- × Beat Freq/Hz: 1 - 10 Hz
- × Cycle Time: Continuous
- × Intensity: Twitch contraction
- × Time: 10 - 30 minutes
- × Notes: Apply cold packs over pads during treatment. For handheld TENS unit use > 80 μ sec.

COMBINING E-STIM AND ULTRASOUND

- × When used concurrently with E-stim, the US head also acts as an electrode pad
- × You may use 1, 2, 3 or 4 pads
- × Using E-stim and US concurrently reduces spasm by opening the constricted blood vessels. The increase blood flow evacuates the lactic acid secreted by the surrounding fatigued muscles.
- × Set E-stim using Acute or Chronic protocol. Set US frequency and intensity according to depth of tissue being treated.

