

SETTING: Laboratory setting. PARTICIPANTS: University student and staff volunteers.

**INTERVENTIONS:** Participants were exposed to 4 different conditions, chosen to evaluate 2 fundamental differences between true and premodulated IFCs. The conditions were different combinations of (1) premodulated or constant-amplitude currents applied at the skin and (2) crossed or parallel current paths.

MAIN OUTCOME MEASURES: Sensory, motor, and pain thresholds; MEIT; and subjective reports of relative discomfort were recorded for each of the 4 conditions. Motor to sensory threshold ratios were subsequently calculated to assess depth efficiency of stimulation.

**RESULTS:** The major findings were that crossed currents (true IFC) had no advantage over parallel currents (premodulated IFC) in terms of motor to sensory threshold ratio, MEIT, or comfort, and that premodulated currents produced higher torque values and less discomfort than constant-amplitude currents (true IFC). These results contradict the claimed superiority of true IFC.

**CONCLUSIONS:** The findings indicate that premodulated IFC, delivered via 2 large electrodes, may be clinically more effective than the traditional true IFC arrangement in terms of depth efficiency, torque production, and patient comfort.

The effect of combined therapy (ultrasound and interferential current) on pain and sleep in fibromyalgia. [Link]

Pain. 2003 Aug;104(3):665-72.

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Multidisciplinary treatment has proven to be the best therapeutic option to fibromyalgia (FM) and physiotherapy has an important role in this approach. Considering the controversial results of electrotherapy in this condition, the aim of this study was to assess the effects of combined therapy with pulsed ultrasound and interferential current (CTPI) on pain and sleep in FM. Seventeen patients fulfilling FM criteria were divided into two groups, CTPI and SHAM, and submitted to pain and sleep evaluations. Pain was evaluated by body map (BM) of the painful areas; quantification of pain intensity by visual analog scale (VAS); tender point (TP) count and tenderness threshold (TT). Sleep was assessed by inventory and polysomnography (PSG). After 12 sessions of CTPI or SHAM procedure, patients were evaluated by the same initial protocol. After treatment, CTPI group showed, before and after sleep, subjective improvement of pain in terms of number (BM) and intensity (VAS) of painful areas (P<0.001, both); as well as objective improvement, with decrease in TP count and increase in TT (P<0.001, both). Subjective sleep improvements observed after CTPI treatment included decrease in morning fatigue and in non-refreshing sleep complaint (P<0.001, both). Objectively, PSG in this group showed decrease in sleep latency (P<0.001) and in the percentage of stage 1 (P<0.001), increase in the percentage of slow wave sleep (P<0.001) and in sleep cycle count (P<0.001). Decrease in arousal index (P<0.001), number of sleep stage changes (P<0.05) and wake time after sleep onset (P<0.05), were also observed and no difference regarding pain or sleep parameters were verified after SHAM procedure. This study shows that CTPI can be an effective therapeutic approach for pain and sleep manifestations in FM.

Analgesic effects of transcutaneous electrical nerve stimulation and interferential currents on heat pain in healthy subjects. [Link]

J Rehabil Med. 2003 Jan;35(1):15-9.

## Cheing GL, Hui-Chan CW.

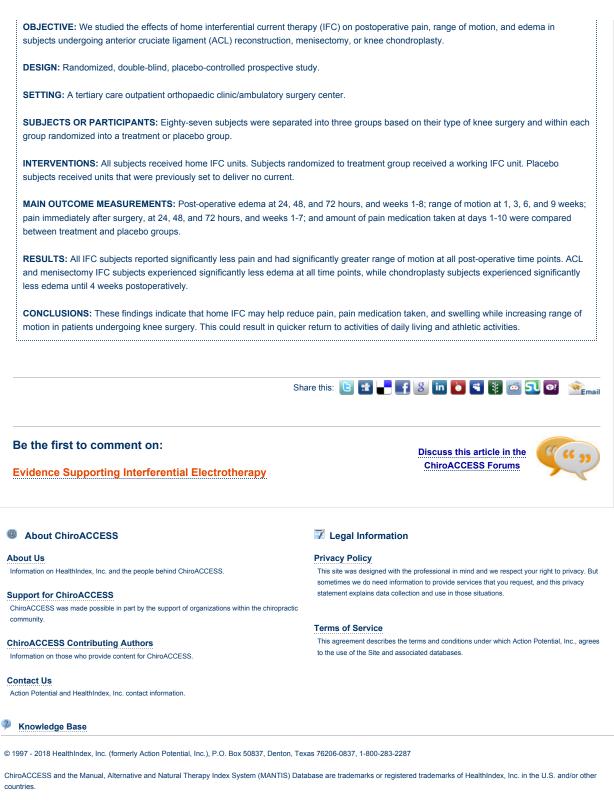
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This study examined whether transcutaneous electrical nerve stimulation or interferential current was more effective in reducing experimentally induced heat pain. Forty-eight young healthy subjects were randomly divided into the following groups: (i) transcutaneous electrical nerve stimulation; (ii) interferential current; and (iii) no stimulation. A multi-function electrical stimulator was used to generate the transcutaneous electrical nerve stimulation or interferential current. A thermal sensory analyser was used to record the heat pain threshold. The stimulation lasted for 30 minutes and the heat pain thresholds were measured before, during and after the stimulation. Transcutaneous electrical nerve stimulation (p = 0.003) and interferential current (p = 0.004) significantly elevated the heat pain threshold, but "no stimulation" did not. The thresholds of the transcutaneous electrical nerve stimulation and interferential current groups were significantly higher than that of the control group 30 minutes into the stimulation (p = 0.017). Both transcutaneous electrical nerve stimulation and interferential current lasted longer than that of transcutaneous electrical nerve stimulation. However, the post-stimulation effect of interferential current lasted longer than that of transcutaneous electrical nerve stimulation.

The effects of home interferential therapy on post-operative pain, edema, and range of motion of the knee. [Link]

Clin J Sport Med. 2003 Jan;13(1):16-20.

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