

Eli's Rehab Report

Clinical Rehab Roundup

In this recurring feature, Physical Medicine & Rehab Coding Alert provides you with summaries of a cross-section of recent clinical studies. Here's what's new this month.

Note Unreliable Muscle Fatigue Indicators

"Measures of localized spinal muscle fatigue." Kumar S, Fagarasanu M, Narayan Y, Prasad N. Ergonomics. 2006 Sept 15;49(11):1092-110.

Researchers sought to determine the best variable to indicate the level of localized muscle fatigue. Six male and six female subjects exerted their maximal voluntary contraction and 40 percent of maximal voluntary contraction of spinal extensors in an isometric lifting activity.

Researchers measured the electromyography (EMG) of erector spinae at thoracic and lumbar levels bilaterally and measured the muscle bed blood volume, level of blood oxygenation to erector spinae at L3 level, and heart rate. They also recorded initial and final values of subjective feelings of fatigue through visual analogue score, rate of perceived exertions, and body part discomfort rating.

Findings: Upon reviewing results, researchers found that the task percentile values of all variables were significantly different and that gender had a significant main effect.

The correlation coefficients between force and other individual variables were weak to modest, but significant. None of the single variables predicted fatigue reliably for either gender or levels of contraction. The regression equations developed were highly significant, and they explained 96 to 98 percent of variance in both genders and contractions.

Researchers Find Possible Ankle-Sprain Prevention

"Unloading reaction to electrical stimulation at neutral and supinated ankle positions." Santos MJ, Liu W. Gait Posture. 2006 Sept 7.

This study investigated how the unloading reactions were modulated during a loaded supinated ankle condition. Researchers proposed that because ankle sprain depends on the load applied to a supinated foot, unloading reactions may protect the ankle from a sprain injury.

Subjects received non-nociceptive and nociceptive electrical stimulations on the lateral aspect of their ankle in standing subjects with the foot in neutral and in a supinated position. Researchers measured the magnitude and latencies of reflex responses using kinetic and kinematic analyses.

Findings: The analysis demonstrated greater reactions for the supinated ankle condition. The individuals also moved their whole body downward and shifted the body weight to the non-stimulated foot.

Therefore, this study suggested that a modified type of the classic flexion reflex, that is, unloading reaction, may be used as a strategy to unload a supinated ankle and potentially minimize the risk of ankle-sprain injuries.

E-Stim Shows Promise for Testing Neuropathy

"Measuring the pain threshold and tolerance using electrical stimulation in patients with Type II diabetes mellitus." Telli O, Cavlak U. J Diabetes Complications. 2006 Sept-Oct;20(5):308-16.

Researchers evaluated 79 diabetics, aged 33 to 74, using electrical stimulation (faradic current) to assess pain threshold and tolerance on upper and lower extremities and repeated the study with healthy controls. Researchers used the Michigan Neuropathy Screening Index (MNSI), 5.07 mmg Semmes Weinstein Monofilament and visual analog scale (VAS).

Findings: Of all participants, 32.4 percent had pain complaints. Eighteen diabetics without neuropathy and nine diabetics with neuropathy reported pain. The result showed that there was a significant difference between diabetics and healthy participants in that diabetics with neuropathy had the highest pain threshold and tolerance.

Researchers concluded that measuring pain threshold and tolerance of diabetic patients using electrical stimulation is an easy, repeatable method to define the onset of diabetic neuropathy.

Auditory Rhythms May Help Walking Patterns

"The effects of auditory rhythms and instruction on walking patterns in individuals post stroke." Ford MP, Wagenaar RC, Newell KM. Gait Posture. 2006 Sept 19.

Researchers investigated the effects of auditory rhythms and arm movement on intersegmental coordination during walking in stroke patients. Eleven subjects walked on a treadmill during (1) systematic increases in velocity, (2) with instructions to "step to the beat" during systematic increases in metronome frequency, and (3) with instructions to "move the arms and legs to the beat" during systematic increases in metronome frequency.

Findings: Moving the arms and legs to the beat resulted in increased arm swing along with 1:1 frequency coordination between the arm and leg. Verbal instructions to move the arms to the beat of a metronome lead to increased arm swing and increased stride length.