Orthopaedic Section of the APTA
Grant Program
Final Report Form

Date: May 12, 2010

Name of Investigators: Susan Saliba, Brian Pietrosimone, Christopher Ingersoll, Jay Hertel

Name of Grant: The Effects of Transcutaneous Electrical Nerve Stimulation as a Disinhibitory Modality in Patients with Tibiofemoral Osteoarthritis

Award Period: __6/1/2008__ to __5/31/10__ (Initial award date is the date that the award was made to your institution)

Current Year of Award completed (circle one): ___1st__, ___2nd__, no-cost extension year (3rd)

Progress reports are due no later than __1 year plus 10 days after the initial award date__. Failure to submit a timely progress report may result in the termination of your award.

1. Summary of accomplishments in the past year: 36 subjects were enrolled in the study; there were 5 participants that dropped out of the study. We have completed data collection on these subjects and are in the process of data analysis.

2. Provide a one-paragraph summary of results or abstract suitable for posting on the Orthopaedic Section website.

Arthrogenic quadriceps muscle inhibition is a common clinical impairment in patients with tibiofemoral osteoarthritis (TFOA). We hypothesized that the use of disinhibitory modalities in conjunction with therapeutic exercise may increase muscle activation and enhance the outcomes of rehabilitation programs. The aim of this study was to investigate the effect of transcutaneous electrical nerve stimulation (TENS) applied to the knee joint on quadriceps central activation ratio (CAR) and self-reported disability in patients with TFOA. TENS was used in conjunction with therapeutic exercise and daily activities. Thirty six subjects were randomly allocated into groups of TENS, Placebo TENS or control where the intervention was used during ADLs and during a 4 week rehabilitation program focused on knee strengthening. All groups had improvements in CAR and reductions in WOMAC scores following rehabilitation (p<0.001), although there were no significant differences between groups (p=0.09). The TENS group showed a strong effect size for both CAR and WOMAC at 4 weeks, however, the placebo TENS and control group had small effects sizes. These data provide evidence that TENS, strategically used for quadriceps disinhibition, may enhance quadriceps activation and patient-oriented outcomes in people with TFOA, however, small sample size and attrition may have affected the results.

1. Attach a list of your publications published or accepted during the past year, or currently being written. Send reprints when available. List presentations made and abstracts accepted for presentation based on this work. Indicate with an asterisk (*) those publications supported by Orthopaedic Section funding.


2. Huffman DH, Pietrosimone BG, Grindstaff TL, Hart JM, Saliba SA, Ingersoll CD. Menthol based


**Accepted Abstracts:**


*Ingersoll CD, Pietrosimone BG, Saliba SA. Effect of Transcutaneous Electrical Nerve Stimulation on Contralateral Quadriceps Activation in Osteoarthritic Patients. Submitted for consideration to the American College of Sports Medicine, Baltimore Maryland, 2010.*

**In Review**


Pietrosimone BG, Selkow NM, Ingersoll CD, Hart JM, Saliba SA. Electrode Type and Placement


1. Provide a budget, using the original approved budget. Indicate total funds spent to date per major categories. If there was > 25% deviation (greater or less spent) of use of funds for any of the budget category, please BRIEFLY indicate the rationale.

<table>
<thead>
<tr>
<th>EXPENSE CATEGORY</th>
<th>TOTAL PROJECTED COST</th>
<th>AMOUNT REQUESTED FROM RFP</th>
<th>SUMMARIZED JUSTIFICATION</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>$16,200.00</td>
<td>$16,200.00</td>
<td>A reduced fee of $225 per session will be needed to cover costs of gait laboratory usage and assistance of in data processing by the laboratory support staff.</td>
<td>Paid</td>
</tr>
<tr>
<td>Cost for Use of the Gait Analysis Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplies</td>
<td>$506.00</td>
<td>$506.00</td>
<td>Electrodes will be used to deliver current into the skin surrounding the knee joint. Two packages of four electrodes have been budgeted for each subject so we have also budgeted for 13 packages of additional electrodes if needed. can be provided if needed.</td>
<td>Purchased - paid</td>
</tr>
<tr>
<td>2x2 Square Dura Stick Electrodes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td>$15,000.00</td>
<td>$4,694.00</td>
<td>Partial funding for a doctoral student stipend is requested to ensure that data can efficiently be collected for all subjects.</td>
<td>Paid</td>
</tr>
<tr>
<td>Stipend for Doctoral Student Collecting Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant Reimbursement</td>
<td>3,600.00</td>
<td>3,600.00</td>
<td>Patients will be compensated $100 for participating in the 4-week quadriceps rehabilitation program and data collection sessions.</td>
<td>Paid</td>
</tr>
</tbody>
</table>
The project has been completed and several manuscripts have been submitted. The plan is to use the data compiled in this project to initiate further development of research on osteoarthritis, quadriceps inhibition, disinhibitory modalities and rehabilitation. Thank you for the support of this project.

	

Return to:

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