

Poster 7.

Self-motivation, Change Readiness, and Exercise Adherence in Patients with Cardiovascular Disease

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Poster 8

Physical Activity and Exercise Self-Efficacy in Patients Recovering from Coronary Artery Bypass

LaPier, Tanya K.; Byquist, Brandon; Jung, Dieter

Poster 9

Relationships of Cardiovascular Disease Risk Factors with Physical Activity Intensity as Measured by Accelerometers

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PLATFORM PRESENTATIONS

COMPARISON OF RESPIRATORY FUNCTION WHILE WEARING A THORACO-LUMBAR-SACRAL ORTHOSIS (TLSO) WITH AND WITHOUT AN ABDOMINAL CUT-OUT. ¹Frownfelter, Donna L.; ¹Stevens, Karen; ²Massery, Mary; ³Bernardoni, Gene. ¹Physical Therapy, Rosalind Franklin University of Medicine and Science, Glenview, IL, USA; ²Massery Physical Therapy, Glenview, IL, USA; ³Bal-lard Prosthetics and Orthotics, Chicago, IL, USA.

Purpose/Hypothesis: The purpose of this investigation was to compare the effect on respiratory function of a Thoracolumbar-sacral Orthosis (TLSO) with and without an abdominal cutout. We hypothesized that respiratory function would be more compromised by wearing a TLSO without an abdominal cutout both at rest and after exercise. **Number of Subjects:** There were twenty subjects, men and women between 23-55 years, with no respiratory or spinal musculoskeletal pathologies. **Materials/Methods:** Subjects were custom fitted for a TLSO by a certified orthotist and participated in three sessions. The first condition involved no TLSO. Subjects were evaluated for baseline and post exercise measures of HR, BP, Perceived Exertion and Pulmonary Function Tests (PFT) utilizing a metabolic cart. In the second and third sessions there was a random order of testing with either a closed TLSO (no abdominal cutout) or an open TLSO (with an abdominal cut out). The testers were blinded to whether the TLSO was opened or closed. In each session HR, BP, perceived exertion by the Borg Scale and Visual Analogue Scale as well as PFTs were performed pre and post a 12 minute walk test. A difference score between pre and post measures of the three conditions, without TLSO, with total contact (closed condition) and with the TLSO cut out (open condition) was calculated for each dependent variable. **Results:** Decreases in forced vital capacity (FVC) and forced expiratory volume in one second (FEV₁) were significant ($p < 0.001$) at rest and post 12 minute walk (repeated measures ANOVA) in both the conditions with the open TLSO and the closed TLSO. The open TLSO had less decrease in FVC and FEV₁ than the closed TLSO. Both of the TLSOs whether open or closed caused an increase in Perceived Exertion and a decrease

in PFT from the control condition with no TLSO. There were significant differences in perceived exertion by Borg scale at rest (Friedman Two-way ANOVA by ranks) and differences between control and open and closed brace conditions (Bonferroni t-tests). There was no significant difference in HR, but there was a significant difference in systolic BP at rest ($p < 0.05$) and a difference between no cut and cut brace conditions) (Bonferroni t-tests). **Conclusions:** A TLSO does limit pulmonary function particularly FEV₁ and FVC, and causes an increase in perceived exertion. An abdominal cut out (open TLSO) has less pulmonary function impairment with less perceived exertion. **Clinical Relevance:** Many patients complain of dyspnea when a TLSO is needed to stabilize the spine for a variety of pathologies. There is often a lack of compliance to TLSO use secondary to an increased perceived exertion and breathlessness. The recommendation is to have an abdominal cut out (open) on all TLSO braces to improve compliance and improved pulmonary function. The subjects in this study did not have pathology. The use of a TLSO in patients with neurological conditions or suffering pain may show an even greater level of impairment of respiratory compromise with the closed (no cutout) condition.

HEMODYNAMIC CHALLENGES FOLLOWING HARNESS APPLICATION AND UPRIGHT TILT IN A SUBJECT WITH CHRONIC SPINAL CORD INJURY. Hutchinson, Karen J.; Andrews, Tiffany; Hylwa, Alison; Stecker, Jenna; Ferreira, Daniel; Cahalin, Lawrence. Physical Therapy, Northeastern University, Boston, MA, USA.

Purpose/Hypothesis: Persons with spinal cord injury (SCI) commonly experience orthostatic hypotension during upright activities. Treadmill stepping for subjects with SCI requires an upright posture which is typically accomplished using a body-weight supporting harness. In an unrelated study, we observed a significant impact on blood pressure simply due to the donning/doffing of the harness system. In this single case study, we systematically assessed the impact of the harness on vital signs while the subject was inclined on a tilt table. Our hypothesis was that the application of the harness would cause an elevated BP response in our subject with SCI. **Number of Subjects:** Our study subject was a 19 y.o. female who was 2 years post incomplete, non-traumatic, SCI at the T12 level. This subject also had a two year history of Type I Diabetes. **Materials/Methods:** The Biodex Harness was applied in supine with circumferential measures taken across the 3 testing dates to assure replication of closure pressures (31" measured at the xyphosternum). Manual heart rate and BP measurements were taken on left and right upper extremities, respectively, during incline on a tilt table from supine to 10, 30, 50 and 70 degrees of head up tilt (HUT). Each tilt angle was maintained for 3 minutes with vital signs taken during the last minute. **Results:** The subject had no difficulty tolerating 70 degrees of HUT without the harness but was only able to tolerate up to 50 degrees of HUT while wearing the vest on all of the testing days. Complaints of nausea, stomach pain and headache resulted in early termination of testing before reaching the greatest tilt angle.