

## **The relationship between perceived exertion and physiologic indicators of stress during graded arm exercise in persons with spinal cord injuries**

**OBJECTIVE:** To examine the relationship between psychologic cues of somatic stress and physiologic responses to exercise in persons with paraplegia and tetraplegia. **DESIGN:** Repeated measures with 2 comparison groups. **SETTING:** Academic medical center. **PARTICIPANTS:** Forty-two subjects between 18 and 69 years of age with motor-complete spinal cord injury (SCI) resulting in paraplegia or tetraplegia (American Spinal Injury Association grades A and B). **INTERVENTIONS:** Not applicable. **MAIN OUTCOME MEASURES:** Subjects underwent peak graded arm ergometry during which heart rate, oxygen consumption (VO<sub>2</sub>), minute ventilation (VE), and ratings of perceived exertion (RPE) (Borg Categorical 6-20 Scale) were measured at successive work rate increments from baseline to fatigue. **RESULTS:** There were inconsistent associations among the outcomes. For subjects with tetraplegia, RPE related positively to heart rate at the initial work rate, but there were no other significant correlations. For subjects with paraplegia, RPE did not correlate significantly with heart rate, VO<sub>2</sub>, or VE. VO<sub>2</sub> and Ve related positively at the first and last work rates. In general, heart rate, VO<sub>2</sub>, and Ve increased as the exercise intensity increased, and were more pronounced in subjects with paraplegia. While RPE values increased with increasing work rates for each group, we found no differences between groups. **CONCLUSIONS:** Our findings contradict the well-accepted relationships between RPE and both heart rate and VO<sub>2</sub> during exercise by people without disabilities, and challenge the use of RPE as a valid psychophysiological index of perceived exertion in persons with SCI.