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## Use of Borg Scale in Patients with Chronic Low Back Pain Attending a Physical Training

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**Background:** Though an association between low back pain (LBP) and physical fitness remains controversial, rehabilitation programs generally include aerobic exercise training to improve cardiovascular endurance. Training workload is usually adapted individually by means of heart rate (HR) though HR can be influenced by several factors and is not always feasible in patients with pain. Based on these arguments, some clinicians suggest that fitness training with a workload increase guided by ratings of perceived exertion (Borg score) are more easy to interpret. The purpose of this study was to study the relevance of a stepwise increase of workload based on the combination Borg-score and HR during a training program attended by patients with chronic LBP.

**Methods:** The population consisted of 223 patients with non-specific chronic LBP of a randomized controlled trial concerning the effectiveness of rehabilitation for such patients (Smeets et al., 2006). Participants were randomized to one of three active treatments or a waiting list for 10 weeks. For the present study we included the patients who participated in an aerobic training program (n=114). Prior to the first training session, patients performed the modified submaximal Åstrand bicycle test to determine their individual target HR zone (ranging from HRrest + 50-55% [HRmax- HRrest] to HRrest + 60-65% [HRmax- HRrest]). Each session included half an hour of aerobic training on a bicycle (5-minute of warming up, 20 minutes within the target zone during which HR and Borg score were recorded every fifth minute, and 5-minute cooling down). In case the patient scored 14 on the Borg scale, the middle of the HR training zone was chosen; with a score above or lower than 14, the workload was respectively decreased or increased in order to train at the lower or upper limit of the HR training zone. After two and four weeks the percentage in the abovementioned formula was increased by 5%. From week three on, the patient also had to sprint three times during one minute. We used a multilevel analysis based on HR, Borg scores and workload recorded at the 10th minute of Sessions 1 (S1), 7 (S7), 13 (S13), 19 (S19) and 25 (S25) in order to evaluate changes throughout the physical training program.

**Results:** Of the 114 eligible patients, 3 patients were excluded because they were taking medication that influenced HR and 12 others because they dropped out of the program before S7. Of the 99 subjects, 74 subjects attended all 25 sessions. The multilevel calculations revealed that whereas mean workload increased hugely (overall 38%) and progressively (from 93.8 Watt at S1 to 129.5 Watt at S25) throughout the physical training program, HR slightly increased (130.2 bpm at S1 and 139.2 bpm at S25) and Borg scores remained stable (13.2 at S1 and 13.3 at S25) indicating an increase in cardiovascular capacity during the course of the training.

**Conclusions:** Using RPE in combination with HR measures in order to train within 65-80% of the HRmax appears a relevant, efficient and appropriate method for aerobic capacity training patients with CLBP.