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אישורים לפרסום התקצירים התקבלו מההוצאות לאור של כתבי העת.

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**Heart rate and heart rate variability parameters at rest, during activity and passive standing among children with cerebral palsy GMFCS IV-V.**

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**Abstract:**

**Abstract Aims:**

To describe and compare heart rate (HR) and heart rate variability (HRV) at rest, during active movements and passive standing among children with cerebral palsy (CP), with Gross Motor Function Classification System (GMFCS) levels IV and V, and to describe the association between daily physical activity and HRV.

**Methods:**

Thirty children with CP were included aged 6-12 years. HR and HRV parameters were recorded during rest, during Gross Motor Functional Measure (GMFM) assessment, during two minutes of repeated performance of the highest activity achieved in the GMFM, and during passive standing. Parents were asked to inform about any habitual physical activities their child participates outside school in the previous 4 months.

**Results:**

Children with GMFCS IV increased their HR and reduced HRV values during the GMFM assessment, the repeated task and during passive standing, while no such effect was noted among children with GMFCS V. Children participated in a limited range of activities with a median frequency of three times a week (range 1-6 times), with insignificant differences between GMFCS

levels. No significant differences were noted in HR or HRV parameters based on activity level.

**Conclusions:**

Only children with GMFCS IV responded to passive and active manipulation of the cardiac autonomic system. This may imply that the HR autonomic regulation system has an opportunity to be influenced by training in this group of children.

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## Exercise-induced hypoalgesia - interval versus continuous mode.

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### Abstract:

Aerobic exercise at approximately 70% of maximal aerobic capacity moderately reduces pain sensitivity and attenuates pain, even after a single session. If the analgesic effects depend on exercise intensity, then high-intensity interval exercise at 85% of maximal aerobic capacity should further reduce pain. The aim of this study was to explore the exercise-induced analgesic effects of high-intensity interval aerobic exercise and to compare them with the analgesic effects of moderate continuous aerobic exercise. Twenty-nine young untrained healthy males were randomly assigned to aerobic-continuous (70% heart rate reserve (HRR)) and interval (4 × 4 min at 85% HRR and 2 min at 60% HRR between cycles) exercise modes, each lasting 30 min. Psychophysical pain tests, pressure and heat pain thresholds (HPT), and tonic heat pain (THP) were conducted before and after exercise sessions. Repeated measures ANOVA was used for data analysis. HPT increased ( $p = 0.056$ ) and THP decreased ( $p = 0.013$ ) following exercise unrelated to exercise type. However, the main time effect (pre-/postexercise) was a trend of increased HPT ( $45.6 \pm 1.9$  °C to  $46.2 \pm 1.8$  °C;  $p = 0.082$ ) and a significant reduction in THP (from  $50.7 \pm 25$  to  $45.9 \pm 25.4$  numeric pain scale;  $p = 0.043$ ) following interval exercise. No significant change was found for the pressure pain threshold following either exercise type. In conclusion, interval exercise (85% HRR) has analgesic effects on experimental pain perception. This, in addition

to its cardiovascular, muscular, and metabolic advantages may promote its inclusion in pain management programs.

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## **Ankle Dorsiflexion Among Healthy Men With Different Qualities of Lower Extremity Movement.**

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### **Abstract:**

#### **Context:**

Lower extremity movement patterns have been implicated as a risk factor for various knee disorders. Ankle-dorsiflexion (DF) range of motion (ROM) has previously been associated with a faulty movement pattern among healthy female participants.

#### **Objective:**

To determine the association between ankle DF ROM and the quality of lower extremity movement during the lateral step-down test among healthy male participants.

#### **Design:**

Cross-sectional study.

#### **Setting:**

Training facility of the Israel Defense Forces.

#### **Patients or Other Participants:**

Fifty-five healthy male Israeli military recruits (age =  $19.7 \pm 1.1$  years, height =  $175.4 \pm 6.4$  cm, mass =  $72.0 \pm 7.6$  kg).

#### **Intervention(s):**

Dorsiflexion ROM was measured in weight-bearing and non-weight-bearing conditions using a fluid-filled inclinometer and a universal goniometer, respectively. Lower extremity movement pattern was assessed visually using the lateral step-down test and classified categorically as good or moderate. All measurements were

performed bilaterally.

#### **Main Outcome Measure(s):**

Weight-bearing and non-weight-bearing DF ROM were more limited among participants with moderate quality of movement than in those with good quality of movement on the dominant side ( $P = .01$  and  $P = .02$  for weight-bearing and non-weight-bearing DF, respectively). Non-weight-bearing DF demonstrated a trend toward a decreased range among participants with moderate compared with participants with good quality of movement on the nondominant side ( $P = .03$  [adjusted  $P = .025$ ]). Weight-bearing DF was not different between participants with good and moderate movement patterns on the nondominant side ( $P = .10$ ). Weight-bearing and non-weight-bearing ankle DF ROM correlated significantly with the quality of movement on both sides ( $P < .01$  and  $P < .05$  on the dominant and nondominant side, respectively).

#### **Conclusions:**

Ankle DF ROM was associated with quality of movement among healthy male participants. The association seemed weaker in males than in females.