הטכניון – מכון טכנולוגי לישראל **הפקולטה להנדסת מכונות**

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ד' 22.06.16 (טז' בסיון, תשע"ו), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 13:30.

תרצה: אריאל פישר

מנחה: פרופ"ח אלון וולף

על הנושא:

The Effects of Body Weight Unloading on Biomechanical Parameters during Overground Walking

The seminar will be given in English

להלן תקציר ההרצאה:

Background: Gait training on a treadmill with a body weight unloading (BWU) system has become a common method of gait rehabilitation for patients with neurological and musculoskeletal impairments. However, the effects of body weight reduction on gait were often confounded by the walking modality-treadmill which did not replicate daily walking. Furthermore, the effects of BWU on overground gait were seldom assessed given that the speed variability was hard to control during overground walking. By controlling for the gait modality, and by devising a mechanical device that pulled the BWU system at a constant speed this study could assess the unique effects of BWU on the biomechanical parameters of healthy subjects walking at a comfortable speed under conditions that replicate daily walking.

Methods: Fifteen normal weight subjects ($19 \leq BMI < 25$ kg/m^2) were instructed to walk overground under a control and three 0%, 15% and 30% BWU experimental conditions. A 3D biomechanical gait analysis was conducted in the Technion gait laboratory (BRML) to measure subjects' biomechanical parameters including lower-limb joint loading and electromyographic patterns.

Results: A significant inverse relationship was indicated between increased BWU levels and a decrease in lower joint kinematics and kinetics (loads and moments) and muscle activity. Despite the modification in the biomechanical parameters, no significant changes were indicated in the kinetic, kinematic and electromyographic curvature patterns of gait.

Conclusion: These findings suggest that overground gait with up to 30% body weight reduction is an efficient method for gait rehabilitation by reducing loads on joints and muscle activity. To further verify this hypothesis this study was expanded to include a sample of ten overweight subjects ($25 \leq BMI < 30$ kg/m^2) instructed to walk overground under the same control and experimental conditions. A 3D biomechanical gait analysis showed similar finding which supported our hypothesis

בברכה,

פרופ'/א אמיר שפק

מרכז הסמינרים