

## ENERGY EXPENDITURE OF NORMAL SUBJECTS DURING HARNESS SUPPORTED TREADMILL RUNNING.

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A study was done to determine the energy expenditure of 14 healthy volunteers running on a treadmill during varying amounts of harness support (HS). The subjects were well-trained runners who had all volunteered to participate in another study during which the speed at which the subjects reached anaerobic threshold (AT) was determined. AT was defined as RER > 1.0 as measured on Medical Graphics gas analyzer. All subjects were familiar with treadmill running with and without HS. Each subject warmed up by running at slow speed on the treadmill for 4 minutes. EKG leads and a breathing tube were next secured. Each subject then ran for 4 minutes without HS at the speed that had produced AT during prior testing (condition 1). After the fourth minute, the treadmill was stopped and the harness support, Pneu-Weight Pneumex Corporation, was applied. With the Treadmill running at the same speed, condition 1 was resumed with the following changes for each condition. Condition 2 HS with only enough vertical force to tighten the cable and straps. Condition 3 HS of 10% body weight (BW). Condition 4 HS of 20% BW. Condition 5 HS 25% BW. Condition HS of 6, 30% BW. Each condition lasted 2 minutes. All subjects reached steady state during each condition. During each condition expired gas was analyzed and the following calculations were made.  $VO_2/Kg$ , METS, RER,  $VO_2/HR$ ,  $VE$ . ANOVA by paired t testing between the various conditions was done with significance at the  $P < .05$  level.  $VO_2/Kg$  significant between condition differences for all except conditions 1&2. METS SD between all conditions. RER no SD between any conditions.  $VO_2/HR$  SD except between conditions 1 vs. 2, 3 vs. 4, 4 vs. 5.  $VE$  SD between all conditions except 2 vs. 3, 2 vs. 1, 1 vs. 3. The results of this study indicate that there is a significant reduction in energy expenditure, measured by expired gas, during treadmill running with 10 – 30% BW harness supported. HS support has been used with orthopedic patients to lessen stress on injured tissues. This study has implications for rehabilitation of patients who are limited by fatigue during ambulation, such as cardiac patients. HS at varying % of BW could be used to gradually improve strength and endurance until full BW ambulation is possible.