

Physiological Monitoring of the Cardiovascular System During a One-Rep Max Bench Press Using the Zephyr Bioharness

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While much is known about the muscular and neurological responses in the body during a one rep max (1RM) bench press test, there is little research regarding the cardiovascular response. The purpose of this study was to investigate the physiological response, specifically in the cardiopulmonary system, during 1RM testing in real-time using the Zephyr Bioharness. Thirty college undergraduates who were enrolled in beginning weight training for three months were asked to wear a BioHarness device during a 1RM bench test. Individual 1RM was found one week prior to test. Prior to testing, subjects followed a standardized warm-up and protocol to obtain 1RM. Subjects instantaneous peak and average heart rate and respiratory rate during, prior to, and following the lift were recorded. Data showed instantaneous heart rate was correlated to the amount of weight successfully lifted ($p < .05$). There were no significant correlations between weight lifted and average heart rate or respiratory rate. Post lift heart rate and respiratory rate had no correlation to amount of weight lifted. Because intensity is highly subjective and the cardiovascular system and its kinetics limit meaningful research on instantaneous cardiovascular response in the field, the correlations found and relationships between variables in this study may be limited. Cardiovascular fitness is an important aspect of recovery in all activities and the ability to recover from maximal lifting is related to and limited by circulation. Future studies should focus on other power activities and the often neglected relationship between those activities and cardiovascular recovery.