

Relationship between the Army Physical Fitness Test and Laboratory-Based Physiological and Musculoskeletal Assessments

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The Army Physical Fitness Test (APFT) is administered twice a year and is designed to evaluate cardiorespiratory fitness, strength, and endurance. The APFT is scored according to gender and age for the number of completed sit-ups and push-ups per two minutes and a two mile run. Despite the goal of the testing protocol, the APFT may not provide a complete picture of individual military readiness or potential for injury.

PURPOSE: To determine the relationship between the APFT and laboratory testing for physiological and musculoskeletal variables. **METHODS:** A total of 90 male Army 101st Airborne (Air Assault) soldiers participated (Age: 28.4 ± 7.1 years; Height: 1.77 ± 0.08 m; Mass: 83.1 ± 12.2 kg). Subjects performed the standard APFT and a battery of laboratory assessments consisting of VO₂ max, anaerobic power and capacity, torso rotation strength, shoulder internal and external rotation strength, quadriceps and hamstring strength, and body composition. The laboratory testing battery was based on variables that would most contribute to optimizing overall military readiness and those most likely related to injury in the Army. Subjects were ranked according to performance for each APFT and laboratory test, with a separate cumulative ranking score calculated for the APFT and laboratory tests. A Spearman Rho correlation was calculated to determine the relationship between the cumulative ranking scores for the APFT and laboratory tests. Secondary Spearman Rho correlations were run between the APFT cumulative ranking score and the individual laboratory tests. **RESULTS:** A moderate relationship was identified between the cumulative APFT and laboratory testing ($\rho = 0.653$, $p < 0.001$). A moderate relationship was identified between the APFT and the VO₂ max ($\rho = 0.709$, $p < 0.001$), anaerobic capacity ($\rho = 0.654$, $p < 0.001$), and body composition ($\rho = 0.632$, $p < 0.001$). **CONCLUSION:** The cumulative ranking relationship between the APFT and laboratory testing was mostly related to the VO₂ max, anaerobic capacity, and body composition test. The lack of relationship between the APFT and the other laboratory tests suggests that despite the potential to score high on the APFT, additional or modified training is necessary to optimize military readiness and prevent musculoskeletal injury.