Maintaining physical readiness is critical to preserve tactical performance capabilities and prevent musculoskeletal injuries. Identification of service- and age-related changes in strength and physiological characteristics and implementation of interventions may promote career longevity and readiness, directly impacting operational performance. PURPOSE: To assess strength and physiological characteristics of US Army Soldiers based on years of service and age. METHODS: A total of 253 male Soldiers participated. Individual subject cohorts were created based on age (20-24 years, 5 year increment) and years of service (1-15 years, 5 year increment). Soldiers performed tests to measure knee and shoulder strength, aerobic capacity, body composition, and physiological performance. This may be greater than the age related changes (p = 0.001). CONCLUSIONS: Age and years of service have a significant effect on Soldier’s capacity/lactate threshold, anaerobic power/capacity, and body composition. One-way analyses of variance with a Tukey Post-hoc comparison were used to identify differences between groups.

**RESULTS**

- **Aerobic capacity (VO2max) was higher in Soldiers with 1-5 (p < 0.001) and 6-10 (p < 0.001) years of service than those with 11-15 years of service than those with 11-15 years of service (p = 0.001 for all three comparisons).**
- **Shoulder internal/external rotation strength ratios were significantly greater in those with 1-5 years of experience compared to those with 6-10 years of experience (p = 0.001). CONCLUSIONS: Age and years of service have a significant effect on Soldier’s strength and physiological performance. This may be greater than the age related changes observed in a civilian population due to the physical demand of operational training and deployment. Physical training interventions should be used to maintain physiological characteristics in those 30-34 years old and with more years of service.**

**ABSTRACT**

**INTRODUCTION**

- **Service members must maintain a high level of physical readiness to meet operational demands**
- **Age related changes in body composition, strength, aerobic capacity, and anaerobic power are well documented in civilian populations, however the relationship between these characteristics and years of military service has not been quantified**
- **The purpose of this study was to assess strength and physiological characteristics in different cohorts of US Army Soldiers based on age and years of service**

**PROCEDURES**

- **Isokinetic knee flexion/extension, shoulder internal/external rotation, and torso rotation strength were measured with an isokinetic dynamometer (Biodex Medical Systems, Inc., Shirley, NY) at 60° per second**
- **Aerobic capacity and lactate threshold were calculated from an incremental treadmill protocol using a Parvo Medics metabolic cart (Parvo Medics, Sandy, UT) and a portable lactate analyzer (Lactate Pro, Arkray Inc., Kyoto, Japan)**
- **Body composition (fat mass and lean mass) was measured using air displacement plethysmography (BodyPod Body, Cosmed, Chicago, IL)**

**METHODS**

- **Total of 253 male Soldiers from the 101st Airborne Division (Air Assault) were created based on age (20-24 years, 5 year increment) and years of service (1-15 years, 5 year increment).**
- **Soldiers performed tests to measure knee and shoulder strength, aerobic capacity, body composition, and physiological performance.**

**RESULTS**

- **Body mass index (BMI) was lower in Soldiers with 1-5 years of service than those with 11-15 years of service (p = 0.023)**
- **Body fat (%BF) was lower in Soldiers with 1-5 (p < 0.001) and 6-10 (p < 0.001) years of service than those with 11-15 years of service.**
- **Aerobic capacity (VO2max) was higher in Soldiers with 1-5 (p < 0.001) and 6-10 (p < 0.001) years of service than those with 11-15 years of service (p < 0.001 for all three comparisons).**
- **Heart rate at lactate threshold (HR at LT) was significantly greater in those with 1-5 years of service than those with 11-15 years of service (p = 0.023)**
- **Left and right shoulder internal rotation (ER:IR) strength ratios were significantly greater in those with 1-5 years of experience compared to those with 6-10 years of experience (p = 0.001). CONCLUSIONS: Age and years of service have a significant effect on Soldier’s strength and physiological performance. This may be greater than the age related changes observed in a civilian population due to the physical demand of operational training and deployment. Physical training interventions should be used to maintain physiological characteristics in those 30-34 years old and with more years of service.**