

Ward Dobbs¹ • Andrew Jagim^{1,2} • Joel Luedke² • Makenna Carpenter¹ • Anna Jacobson¹
Rachel Schmitt¹ • Thomas Almonroeder³

¹University of Wisconsin–La Crosse, ²Mayo Clinic Health System, ³Trine University

INTRODUCTION

The Army Combat Fitness Test (ACFT) is a newly acquired testing battery utilized to evaluate physical fitness capabilities of military personnel. The purpose of this study was to evaluate the association between ACFT scores and laboratory measurements of body composition, maximal isometric strength, explosive power, anaerobic power and capacity, and aerobic capacity.

METHODS

Thirteen members of the Reserve Officers' Training Corp (ROTC) volunteered to participate in the study. One laboratory session involved participants performing a series of countermovement jumps (CMJ) followed by two maximal isometric mid-thigh pull (IMTP) on a pair of portable force plates, respectively. Then, participants performed a Wingate test that involved maximal-effort cycling for 30 seconds at a load of 7.2% of their body mass. The body composition and maximal oxygen consumption was obtained on a separate day. Laboratory measurements were collected within two weeks of participants completing the ACFT. Pearson's correlations were performed to assess the relationship between laboratory and ACFT measurements.



CONCLUSIONS

Our results suggest higher explosive power, relative aerobic and anaerobic fitness, along with less body fatness are associated with a better overall ACFT performance score.

RESULTS

Results indicate CMJ, peak oxygen consumption, percent fat, and mean watts were significantly associated ($P < 0.05$) with the majority of the ACFT tests. Maximal strength via IMTP had a strong association with the standing power throw, deadlift, and sprint drag carry.

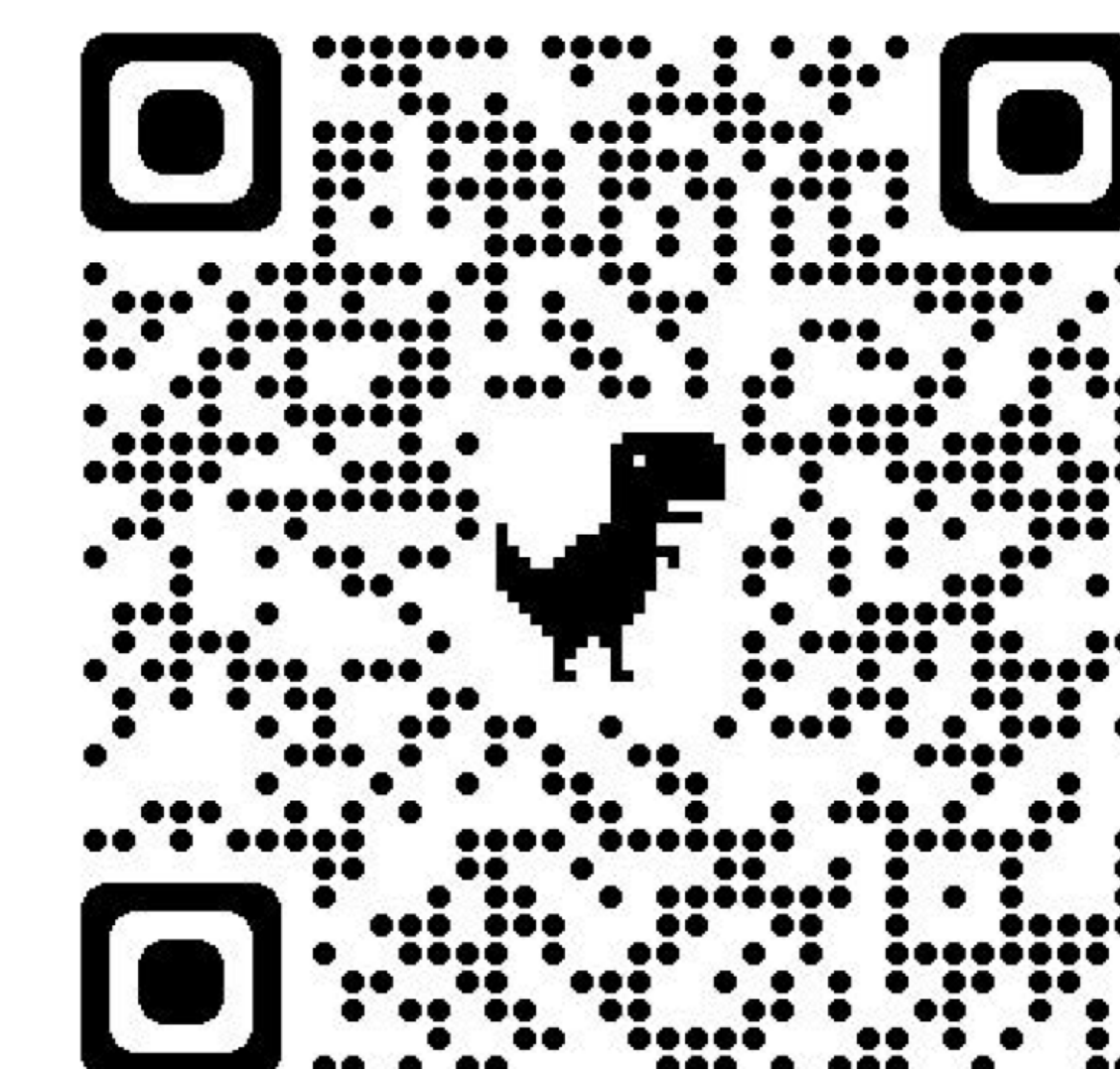
Table 1. Pearson's correlations between the Army Combat Fitness Test and a laboratory testing battery

Measurement	MDL (kg)	SPT (m)	HRP (#)	SDC (s)	PLK (s)	2MR (s)	Total Score (au)
Jump Height (cm)	0.83 **	0.764 **	0.738 **	-0.782 **	0.284	-0.601	0.742 **
IMTP (N)	0.669 *	0.802 ***	0.447	-0.609 *	0.134	-0.313	0.468
IMTP (N/kg)	0.498	0.574 *	0.298	-0.467	-0.023	-0.162	0.313
Wingate Peak (W)	0.734 **	0.781 **	0.655 *	-0.739 **	0.235	-0.581 *	0.569 *
Wingate Peak (W/kg)	0.748 **	0.759 **	0.658 *	-0.767 **	0.214	-0.594 *	0.566 *
Wingate Average (W)	0.864 ***	0.874 ***	0.759 **	-0.848 ***	0.358	-0.712 **	0.704 **
Wingate Average (W/kg)	0.896 ***	0.841 ***	0.761 **	-0.892 ***	0.376	-0.745 **	0.727 **
Body Fat (%)	-0.896 ***	-0.843 ***	-0.725 **	0.859 ***	-0.504	0.684 **	-0.758 **
$\dot{V}O_{2peak}$ (mL/kg/min)	0.747 **	0.54	0.804 ***	-0.744 **	0.557 *	-0.922 ***	0.727 **

* = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; %Fat = percent body fat; 2MR = 2-mile run; HRP = hand release push-up; IMTP = isometric mid-thigh pull; MDL = 3-repetition maximum deadlift; PLK = plank; SPT = standing power throw; $\dot{V}O_2$ = peak oxygen consumption.

DISCUSSION

For military personnel, such as ROTC members, it is important to improve explosive power, aerobic and anaerobic capacity, along with maintaining a lower body fat percentage to optimize ACFT performance. Furthermore, it appears values of absolute strength may be less important when training for the ACFT.



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