

Establishing the Learned Effect of Repeated Wingate Anaerobic Tests

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ABSTRACT

The Wingate anaerobic test (WAnT) is a recognized and well-established measure of power output, muscular endurance, and fatigue. However, a learning effect could reduce the reliability of these measures. **PURPOSE:** To establish the number of WAnT trials needed to produce a learned effect. **METHODS:** Thirty-six apparently healthy college-aged men ($n=20$) and women ($n=16$) who had not previously performed a WAnT participated in five WAnT trials separated by a minimum of 72 hours. Peak Power (PP) and Mean Power (MP) were recorded for each trial. Resistance for trials was calculated at 7.5% of each respective participant's weight. **RESULTS:** In men, paired samples t -test revealed PP increased on all trials (2-5) when compared to trial 1 (+44.66W, +49.19W, +55.80W, +63.95W; $p=0.02$, $p=0.01$, $p=0.01$, $p=0.00$, respectively). PP significantly increased from trial 1 to trial 2 (849.21 ± 127.41 watts to 893.87 ± 143.92 watts, $p < .05$), but leveled thereafter with no significant differences between trials 2-5 ($p > .05$). The same results were found for MP, with a significant increase from trial 1 to 2 (627.90 ± 79.01 watts to 660.04 ± 79.66 watts, $p < .01$), but no differences found between trials 2-5 ($p > .05$). There was a trend toward an elicited peak MP at trial 3 ($p = .09$, *Cohen's d* = -.83). In women, the average PP and MP for trial 1 was 547.74 ± 94.56 watts and 415.91 ± 68.21 watts, respectively, with no significant differences found between trials ($p > .05$). These results suggest that a learned effect is present within PP and MP until trial 2 of the WAnT, with a trend toward peak MP at trial 3 for male participants. **CONCLUSION:** Thereby, suggesting that when performing WAnT, utilizing less than 3 practice trials might elicit significant power increase in male participants due to this learned effect. Current data suggests that female participants elicit peak power at trial 1 of the WAnT, with no significant increase in subsequent trials. Additional research should be conducted in order to further investigate the non-significant trend of increasing power output across WAnT trials in male participants as well the lack of female learned response.