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Evaluating the Effects of Two-Minutes Active Recovery on a "Booster" VO_2max Test Using Ultramarathon Runners

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Maximal oxygen consumption (VO_2max) tests typically end at the point of volitional exhaustion. Yet, prior research with averagely fit individuals and highly fit NCAA female athletes suggest that concluding a maximal treadmill test with 2min active recovery and allowing subjects to exercise a second time (ie. a booster test) at the workload eliciting the initial volitional exhaustion results in significantly greater VO_2 max values (1.4% and 4.2% mean increase, respectively). The potential effects of this testing sequence (ie. 2min active recovery) on VO_2max treadmill graded exercise tests (GXT) has not been evaluated utilizing ultramarathon runners, yet accurate assessment of these unique athletes' VO_2max is crucial. **PURPOSE**: To examine changes in VO_2max values, in fit ultramarathon runners, following 2min of active recovery at the conclusion of a treadmill GXT to volitional exhaustion. **METHODS**: Twenty-nine (m = 19, f = 10) ultramarathon runners completed a max treadmill GXT by reaching volitional exhaustion (MX1). Immediately following 2min active recovery (at 0% grade & 2.5 mph), subjects exercised to volitional exhaustion a second time (MX2). MX1 and MX2 were compared using a Paired-Samples t-Test with significant differences occurring at $p \leq 0.05$. **RESULTS**: MX1 (53.9 $\pm$ 6.0 ml/kg/min) was significantly different ($p = 0.03$) than MX2 (52.7 $\pm$ 7.0 ml/kg/min). The mean change from MX1 to MX2 was -2.2%, yet 37.9% of the subjects benefited (+2.9% mean increase) from the booster test with individual increases of +0.2% up to +8.0%. **CONCLUSION**: Mean results suggest that 2min active recovery may not allow significantly greater VO_2max values to be achieved by fit ultramarathon runners during a max treadmill GXT, yet 37.9% of the subjects increased their VO_2max during the "booster max" treadmill protocol. Future research may examine if fitness level, training experience, age, ultramarathon distance specialty, or other variables might affect this exercise testing protocol.