TACSM Abstract

A New Way to Measure Physical Exertion: The Compensatory Reserve

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ABSTRACT

During periods of physiological stress, such as hemorrhage, the body is able to deploy multiple mechanism of compensation such as changes in heart rate and vascular tone. These compensatory mechanisms allow the body to maintain blood flow, and therefore oxygenation to major organs. The degree to which these compensatory mechanisms are active in simulated hemorrhage are detectable in arterial waveforms and quantifiable by the compensatory reserve index (CRI). **PURPOSE**: Because physical exertion also activates multiple compensatory mechanisms, it was hypothesized that CRI could be used to quantify physical exertion. **METHODS**: Healthy human subjects (N = 6) performed a VO2 max test on a cycle ergometer utilizing progressive exercise in 3 minute increments, while CRI was continuously measured. **RESULTS**: CRI measurements were negatively correlated with %V02 (R2 = .998). **CONCLUSION:** Taken together, these results suggest that the CRI alone can be used to accurately quantify physical exertion.