Journal of Aerobics & Fitness: Open Access

Cheng, J Aerobics Fitness 2016, 1:1

Editorial Open Access

Critical Power Estimated From a Single Exercise Test

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Rec date: March 29, 2016**; Acc date:** March 30, 2016**; Pub date:** April 2, 2016

Citation: Cheng CF (2016) Critical Power Estimated From a Single Exercise Test. J Aerobics Fitness 1: e104.

Editorial

Cardiovascular fitness, that health professionals and fitness instructors very concern about and do many efforts on, is an important component of health-related fitness. To prescribe an efficient and effective training program for aerobic endurance, determination of exercise intensity is important. One method to identify the exercise intensity, which can be used to discriminate the heavy from severe exercise intensity domains, is critical power (CP) test. The CP concept, proposed by Monod and Scherrer [1] uses simple mathematical models to identify a power output that an individual is able to maintain at a physiological steady state. Traditionally, several exhausted exercise tests are required to define the CP value. Recently, one single exercise test, terms 3-min all-out test (3MT), has been developed to estimate the CP for cycling, running, arm crank ergometer exercise, and swimming [2-7]. We also found that the 3MT concept can be appropriately used for the rowing ergometer exercise [8]. Previous studies have reported that the 3MT had a moderate to high test-retest reliability [3,8-10] and that the end-test power (EP) derived using the 3MT can appropriately determine the CP value estimated using the traditional work-time and power-1/time CP models [8,7]. To test the sensitivity and validity of this new method, our lab also investigate the effects of training (e.g. high-intensity interval training, inspiratory muscle training), heat environment, and nutritional supplementations (e.g. caffeine, beta-alanine) on the 3MT performance [11,12,10].Our results indicated that the 3MT is a validity and sensitivity method to estimate the conventional CP value, and to discriminate between heavy and severe exercise intensity domains.

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