

Physiology of Endurance Performance

Terminology

Definitions

- Kinesiology
 - The scientific study of (human) movement.
- Physiology
 - The science of the functions of the living organism and its components and of the chemical and physical processes involved (Taber's Medical Dictionary).
 - Human
 - People, a member of the species Homo sapiens (Dictionary.com)
- Exercise Physiology
 - A basic and an applied science that describes, explains, and uses the body's response to exercise and adaptation to exercise training to maximize human physical potential (Plowman, & Smith, 1997).
- Endurance
 - The ability to sustain a prolonged stressful effort or activity (Merriam-Webster)
- Performance
 - The execution of an action; something accomplished (Merriam-Webster)

Physiology of Endurance Performance

- Important concepts
 - Running economy
 - Aerobic power
 - Anaerobic power
 - $\dot{V}O_2$
 - $\dot{V}O_{2max}$
 - Heart rate
 - Power - HR - $\dot{V}O_2$ Relationship
 - Lactate threshold
 - Anaerobic threshold, OBLA, ventilatory threshold, lactate turnpoint
 - Fick equation
 - Thermoregulation
 - Hydration strategies
 - Fueling for/during/after endurance events
 - Fatigue

Terminology:

Endurance, Physiology, Performance

- Endurance
 - The ability to withstand extraordinary mental or physical stress for a prolonged period. *Taber's Medical Dictionary*
 - The ability to continue
 - Despite pain, fatigue, stress

Endurance Events

- Marathon
 - 26.2 miles
 - Elite finishers: ~2 hours
 - Mere mortals: 3-6 hours
- Ironman
 - Swim 2.4 miles, Bike 112 miles, Run 26.2 miles
 - Elite: 8-8.5 hours
 - MM: 11-16 hours

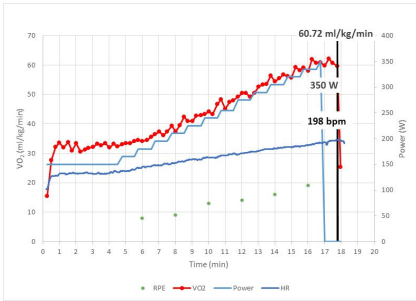
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Endurance, Physiology, Performance

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Subject mass = 69.1 kg

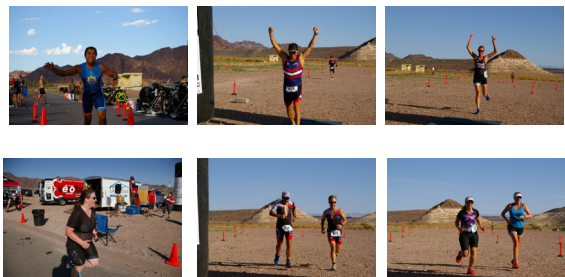
Age = 36 yo



$VO_2 = \text{Power}(10.8) / \text{mass} + 7.3$

Terminology:
Endurance, Physiology, Performance

- Structure, Function, and Performance
 - Structure
 - the arrangement of the parts of the whole
 - Function
 - normal characteristic or action
 - Performance
 - functional effectiveness



It is important to use terminology correctly

As you read the book or a paper, write down key terms.

Make sure you can define them, provide an equation (when appropriate), and state the units (when appropriate).
