Holmes Fitness Coaching

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VO_{2max} Testing

In the last issue of Performance Cycling, I described two methods you can use to create training zones based on your *Lactate Threshold* (the highest intensity a fit cyclist can maintain for 60 minutes). The primary purpose of that discussion was to provide a model that can be used to assess cycling fitness and to develop training sessions based on a specific workout intensity.

While lactate threshold is an outstanding assessment measure, there are other measures that can be useful as well. One such measure is VO_{2max}. To understand this form of assessment and the value it can provide, it is important to have a clear understanding of aerobic capacity. Aerobic capacity (used interchangeably with VO_{2max}) is the maximal amount of oxygen the body can consume during exercise. This is critical for endurance athletes because of the role oxygen plays in energy development. Specifically, the body uses oxygen to convert food into adenosine triphosphate (ATP), the human 'gasoline' needed to facilitate all muscular contraction and bodily processes. A central aspect of cycling performance is the ability to produce sufficient energy to complete workouts and competitive events at the highest level possible. More oxygen equates to greater ATP production, which means greater endurance on the bike. That's why a high VO_{2max} is great for cyclists and other competitive endurance athletes. While it is not a very good predictor of cycling performance (lactate threshold is a much better predictor, which is why we develop training zones based on LT instead of VO_{2max}), it is a very good predictor of endurance sports potential.

Aerobic capacity can only be measured in a lab setting using a cycling ergometer and a metabolic cart, which consists of several instruments that measure the volume of air the cyclist breathes, the amount of oxygen extracted from this air and amount of carbon dioxide produced. The test consists of pedaling at progressively higher workloads (typically increased every one to three minutes until the cyclist reaches his/her limit) while expired air is collected through a mouthpiece for analysis by the metabolic cart. A computer then calculates $VO_{2\,max}$, which can be articulated in both absolute and relative measures. The absolute measure is liters of oxygen utilized per minute (L/min). The relative measure, which is the more common usage, is milliliters of oxygen utilized per kilogram of body weight per minute

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Cycle-Max Coaching

It is with great pleasure that I introduce my Cycle-Max Coaching program. Cycle-Max Coaching is a one-on-one, virtual coaching process that will maximize your cycling performance. It is based on the idea that there are three primary elements to effective performance: *training*, *nutrition* and *recovery*. The primary goal of Cycle-Max Coaching is to facilitate the integration of these elements in a way that allows you to achieve your cycling goals. In other words, through the Cycle-Max Coaching process, we work together to develop a systematic training program that incorporates effective nutritional practices and allows for sufficient recovery. To learn more about Cycle-Max Coaching, visit my website at www.holmesfitness.com and request a FREE CONSULTATION to begin the process that will maximize your cycling performance.

VO_{2max} Testing (continued)

(ml/kg/min). The average untrained person has a VO_{2max} of about 40 ml/kg/min, while well-trained cyclists typically have aerobic capacities in the range of 55 to 65 ml/kg/min. Of course, some elite athletes possess much higher aerobic capacities. For example, Lance Armstrong's VO_{2max} has been measured as high as 83 ml/kg/min.

If you want to have your aerobic capacity measured, you will need to identify a local sports performance lab that provides metabolic testing. The number of labs is increasing and in some cases, it can be as simple as going to a local bike shop or university. Cyclists can often have lactate threshold and aerobic capacity measured at the same time. Just keep in mind that the tests can be a bit costly ($100 to $200 in many cases). Since lactate threshold is the more important measure for the development of training zones, and you can identify lactate threshold heart rate with a reasonable degree of accuracy in the field, you may justifiably decide to bypass aerobic capacity testing. However, if you decide to have it done, remember that aerobic capacity is not a great predictor of cycling performance, only potential. If your VO_{2max} is high, that does not guarantee you will be a great cyclist, although you are off to a nice start. On the other hand, if your aerobic capacity is relatively low, don't be discouraged. With proper training and nutrition, you will still find great success in cycling!

About the Author

Dr. Tyrone A. Holmes, LPC, CPT is a speaker, trainer, consultant, fitness & cycling coach, author and competitive cyclist.