Holmes Fitness Coaching

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Calculating Your Training Zones with Lactate Threshold

In the last two issues of Performance Cycling, I introduced the 5 Heart Rate Training Zones and described two methods for calculating these Zones: the *Age Formula* and the *Karvonen Heart Rate Reserve Method*. Both of these techniques are based on estimating your maximum heart rate (MHR) and using a percentage of this number to determine your training zones. The problem with this process is that the *220 – your age formula* can miscalculate your actual heart rate by 10-15 beats per minute. Fortunately, there is a more effective method for developing your training zones. This method is based on your *Lactate Threshold*.

Simply stated, lactate threshold (LT) is the highest intensity you can maintain for 30 to 60 minutes. Often referred to as *one-hour power*, it is the point beyond which you must reduce your cycling effort. That's because once you pass your lactate threshold, your body starts producing lactic acid more quickly than it can remove it. You have no choice but to reduce your effort. Lactate threshold is an excellent predictor of competitive cycling performance. The higher your threshold, as a percentage of aerobic capacity (i.e., VO^2 Max), the faster you will be able to ride a bike. For example, in sedentary individuals lactate threshold will typically be 40 to 50% of VO^2 Max. Conversely, in trained cyclists LT is typically 80 to 90% of aerobic capacity. The good news is that with proper training, anyone can improve their lactate threshold.

Because of the strong connection between lactate threshold and cycling performance, it makes sense to develop training zones based on your observed threshold level. Determining this level is a relatively simple process. Generally speaking, there are two ways to do it. The first, and more accurate method, is through laboratory testing on an indoor trainer. After a thorough warm-up, the cyclist pedals up to a designated power level (e.g., 150 watts). She holds this power level for 3 minutes, and then increases power by a predetermined amount (e.g., 30 watts) every 3 minutes. This process repeats until exhaustion. At each 3 minute interval, the tester takes a blood sample and examines it with a lactate analyzer. The point where blood lactate increases dramatically corresponds to lactate threshold. The tester can identify the cyclist's precise lactate threshold heart rate (LTHR) and develop Heart Rate Training Zones based on this information.

Inside this Issue:

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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.

Calculating Your Training Zones with Lactate Threshold (continued)

The second method may be slightly less accurate, but is very effective nonetheless. It is referred to as *the road test* and allows you to accurately estimate your LTHR. All you need to do is perform a 30-minute time trial when you are well-rested. Of course, this is easier said than done because you will be working very hard! After a thorough warm-up, begin your time trial. Your goal is to ride as hard as you possibly can for the entire 30 minutes. Ten minutes into the time trial, start your heart rate monitor. Your average heart rate for the last 20 minutes of the time trial will be a close estimate of your LTHR. For example, if your average heart rate for the last 20 minutes is 160, this is a good estimate of your LTHR. You can use this information to create your Heart Rate Training Zones as follows:

Zone 1 = 65-75% of LTHR
Zone 2 = 75-85% of LTHR
Zone 3 = 85-94% of LTHR
Zone 4 = 98-105% of LTHR
Zone 5 = >105% of LTHR

Note that there is no Zone for 95-97% of LTHR. That's because research has indicated that this is a "no man's land" where you are working too hard for recovery, but not hard enough to significantly improve your physiology. Based on our example, the training zones for a cyclist with an estimated LTHR of 160 would be as follows:

Zone 1 = 104 to 120 BPM
Zone 2 = 120 to 136 BPM
Zone 3 = 136 to 150 BPM
Zone 4 = 157 to 168 BPM
Zone 5 = 168+ BPM

One Final Note: Testing for lactate threshold is very strenuous. Make sure you have been cleared for rigorous exercise by your physician before participating in either test!

About the Author

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