

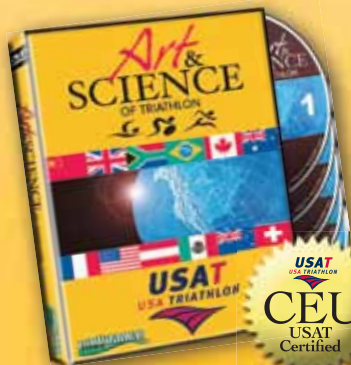
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▶ Medically Speaking

THE PHYSIOLOGY OF TRIATHLON

BY JORDAN D. METZL, MD



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Jamie, a 40-year-old triathlete, came in to see me last week. “Hey, Dr. Metzl,” he said, “my brother keeps beating me in long-distance triathlons. I can kick his butt in the shorter-distance races, but when we get to long-course races, he toasts me. I’m having trouble holding my head high. What can I do?”

Jamie is hardly alone in wanting to go faster and, more importantly, faster than a sibling or friend. Chances are you do, too. So let’s look at the physiology of triathlon to figure out how you can improve your speed.

For all of you who wake up at 5:30 a.m. to get on your bike, hop into the pool or do a run workout, here’s the bad news. Much of your potential, maybe even 60 percent to 70 percent once you are relatively fit, is genetically predetermined. That’s right; your genetics make a huge difference. So much so that if you want to create kids who are successful in triathlon, you would be well advised to go find someone of the opposite gender who is faster than you and procreate with him or her.

Does that mean we can all hit the snooze button and go back to bed since our fate is predetermined? Absolutely not. Let’s go after that other 40 percent!

When we talk about success in endurance sports, there are several important things to consider. Successful triathletes generally can generate large amounts of energy through a process called aerobic (with oxygen) metabolism. This is in contrast to sprinters, who need quick bursts of speed, which are achieved through anaerobic (without oxygen) metabolism. The goal of triathlon training is to find ways to efficiently increase aerobic metabolism. This is sometimes measured through a VO_2 max test, which can assess the body’s ability to maximally utilize oxygen, and thus make energy, during intense exercise. Even more predictive is the lactate threshold, the level at which lactate, a product of muscle metabolism, can’t be cleared fast enough and muscles start to fatigue.

So how does a triathlete go about improving his or her own physiology?

There are several main workout patterns that, when executed at the correct frequency, help athletes achieve their physiologic potential. Triathletes who are looking to improve their physiologic profile should make sure to work on each of them in different amounts,

based on the timing and distance of their target event.

1. **ENDURANCE TRAINING:** Aside from the musculoskeletal importance of spending sufficient “time on the bike, time on the feet, and time in the pool,” endurance training truly is an essential component of building a physiologic base. Prolonged workouts at moderate intensities are the best endurance builders. They should be done year-round, with increased duration closer to your goal races.
2. **TEMPO TRAINING:** Once the base is in place, tempo training, which consists of moderately sustained efforts at moderately high intensities, can be used to further increase the lactate threshold.
3. **INTERVAL TRAINING:** We all hate it; we all love it. Intervals are short, repeated high-intensity efforts that increase aerobic capacity, speed and fatigue resistance. Because of the discomfort it causes, many triathletes do not do enough interval training.
4. **CIRCUIT TRAINING:** Stronger muscles generate more force, which improves speed. Regular strength training is a key part of triathlon training, as it makes muscles much more physiologically efficient and much better able to absorb joint loading force from exercise.

So, whether you are my brother Jamie or a triathlete who wants to go faster anywhere in the world, make sure your training program includes regular doses of the components described above. Paying regular attention to these physiologic tips and combining them with good technique, nutrition and body awareness, will enable you to “kick it” all the way to the finish line. ▶

Jordan D. Metzl, MD, is a nationally recognized sports medicine specialist at Hospital for Special Surgery in New York City. In addition to his medical practice, Dr. Metzl is a 27-time marathon runner and six-time (and counting) Ironman finisher. For more information, visit DrJordanmetzl.com.