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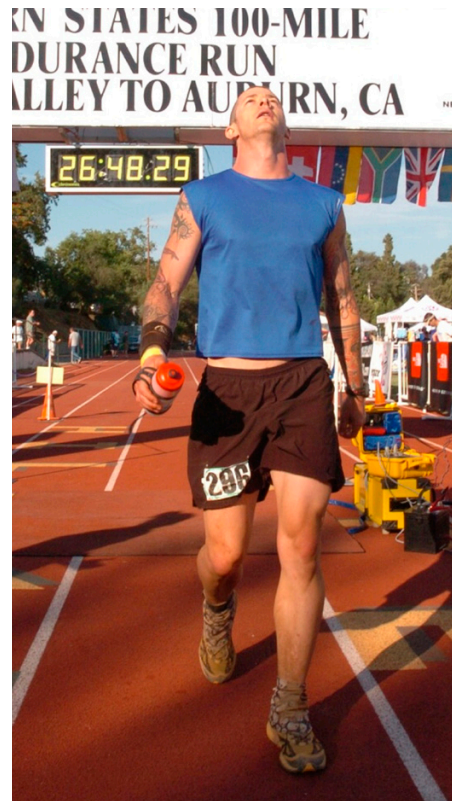
The New World Order for Endurance Training

Brian MacKenzie

The human psyche is a very powerful thing. This same psyche is responsible both for very limiting, self-defeating thoughts and also for strong, self-empowering thoughts that enable us to accomplish great things. For example, how many people believe they can run a marathon, 50 kilometers, or even 100 miles? How about squatting 500 pounds, or even 1000 pounds? Can you do a 10K in less than 40 minutes? If your answer is, "I could never do any of those things," you should stop reading now. You just might not have the psychological freedom to understand this article.

I come from a power sports background where I excelled as a youth and teenager in short-course swimming and water polo. In my early twenties, I was into powerlifting, but I wrecked my back with a poorly done deadlift set, which didn't allow me to do anything for several months after.

In late 2000 I started training for my first triathlon: a sprint-distance race that involved a 500-meter swim, a 13-mile bike, and a 5-kilometer run. My approach to training was "the more, the better." I averaged about six miles per



week in swimming, 100+ miles in biking, and 30+ miles in running. I was doing zero strength training—after all, I thought strength training had nothing to do with what I was doing. I was greatly mistaken! As it turned out, during the race I was passed by several rather obese individuals, who seemed by the looks of things to be very unfit. I was humbled, to say the least, but also motivated unlike any other time in my life.

I climbed up the ranks of the triathlon world shortly thereafter with the completion of an Olympic-distance race, and then a half-Ironman, but I didn't stop until I completed Ironman Canada. This was a great race, and I was thankful to finish. The training, however, was incredibly time-consuming because it was before I knew better so it was purely oxidative and overdone. I probably trained

24 to 30 hours per week, including roughly eight miles of swimming, 200+ miles of cycling, and 50+ miles of running per week. I had no life to say the least; my wife was not happy about things; and I was severely overtrained. Par for the course in the endurance world, but not good for the body and the personal life.

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Therefore, after Ironman I started questioning the training. Why was everybody doing all this long aerobic stuff so much? I wasn't out of breath doing these events. More importantly, why was I following their model? Essentially, once you develop an aerobic base and continue with an exercise program, the base isn't going to diminish. In 2001 I was also introduced to someone who would drastically change my worldview. [Dr. Nicolas Romanov](#) questioned everyone and believed there was a shorter, better way than all of these crazy ways athletes were training. I finally shut my mouth and listened in late 2004 and started training with purpose. I will briefly explain below what I mean by purposeful training.

In June of 2006 I ran The Western States 100 endurance run in 26 hours and some change. Temperatures reached 110 degrees in the canyons of this isolated race. I climbed more than 17,000 vertical feet and descended more than 22,000 feet. I started doing strength work and trained an average of 10.5 hours a week for this event (my Ironman had taken me just over 11 hours, not the 26 this one took). I researched training and got to know Jason C. Brown of [CrossFit Philly](#) for his incredible knowledge and all-out fanatical training with kettlebells, and made them a part of my plan. I was doing more interval training than I'd ever done and trying (key word) to hold specific paces and avoid the long, monostructural aerobic stuff. But it still wasn't right. Don't get me wrong, the kettlebell stuff was great, but even 10.5 hours of training still left my wife disheartened and wore my body out.

On September 15, 2007, I completed what I am told is the sixth toughest 100-mile run in the world, the Angeles Crest 100 (the Western States 100 doesn't really even qualify in the top ten). I averaged 6.5 hours of training per week. That includes strength training (almost 3 hours), CrossFit, and speed, interval, and pace work. My body learned to become aerobic at the higher paces, and even during the speed work (see next paragraph on the testing). My one-repetition maximum squat at the beginning of this revamping was 250 pounds. Three weeks before the race I could do 240 pounds for six consecutive reps pretty easily. I didn't put on a single pound of body weight, and I set personal records at every distance I ran. I showed up to the race in an almost perfect mental state, not overtrained and broken down. I was positive, and I took care of my body pre-race: lots of fluids, clean nutrition, plenty of myofascial release, and stretching. I went in with the expectation of finishing, and I did just that.

We at CrossFit Newport Beach/Genetic Potential ran

some metabolic testing on three of our athletes with the help of Vitality Health and Wellness in Orange County. We had the athletes do hill repeats on a treadmill at 100 meters in length on a 12 percent grade at 8 to 10 mph, recover to a heart rate of 120 beats per minute, and then repeat immediately. We also had them run Tabata intervals (20 seconds of work and 10 seconds of rest in each interval) on the treadmill at a 12 percent grade, at either 8 or 10 mph, depending on the athlete's ability. We tested the athlete's ability to perform eight rounds. Just being able to finish this four-minute workout was the goal. We were looking at the individuals' RQ (respiratory quotient) level, whether or not they were below 1.0 (the level at which you still burn fat but have not really set off any stress hormones), and if they did go above 1.0, how long it took to recover. Of the two athletes who did the Tabata run, only one crossed 1.0 briefly. Both actually dropped after the first couple of intervals from .98 and 1.01 to .96 and .98, respectively. This means they were still aerobic. The individual who did the hill repeats never crossed .96. So we were making the athlete work at all-out speeds/paces during the work cycle, with only 10 seconds of recovery, and they not only still had the ability to recover, but they were in an aerobic state, which means they were adapting to the protocol. So what we were doing not only worked, it worked well!

One of the athletes tested came to us roughly eighteen months ago, tired of having a bulky body type and wanting to run a marathon. He is the owner of a big company, and time was a limiting factor. Despite his initial belief that he could not run much faster (that psyche thing), we got him a lot faster. I knew from his professional career that he could overcome obstacles and achieve success; we just needed to convince him of it. After establishing an aerobic base we commenced interval, speed, and pace training. Nothing was periodized, as that is a complete farce as far as I'm concerned. The only time we backed off was in preparation for time trials, going harder (holding faster than average paces), and races. He did strength training from the beginning. His first marathon was completed in 4:25. Five months later he did another in 4:05, on an average of 5 hours and 17 minutes of training per week. So, he achieved a 20-minute drop in time with zero injuries (he did technique training as well), while never running more than 30 miles per week.

How does all this work?

Let's take a look at what is the most non-limiting factor: VO_2 /aerobic/metabolic training. We established this when

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he ran his first 10K. If you look at runners who make the transition from 10K to marathon, there is no difference in their VO_2 max levels. In other words, if they are already performing aerobically at a level where they complete a 10K, there is nothing more we can do in that realm that will improve their performance.

So where do we go from there? We push the “go” button and work on what limiting factors remain. Have you ever done a triathlon, or run a 10k (or more) and experienced not a lack of breath (cardiovascular endurance isn’t the limiting factor), but a soreness in the legs or even other muscles? This is a lack of strength, stamina, and conditioning! Coach Glassman explains this in CrossFit’s “third standard of fitness” when talking about the body’s three metabolic pathways: “Favoring one or two [metabolic pathways] to the exclusion of the others and not recognizing the impact of excessive training in the oxidative pathway are arguably the two most common faults in fitness training.” Favoring one metabolic pathway (the oxidative or aerobic one trained in endurance activity, for example) could not be more wrong in principle and methodology. Having athletes doing 100+ mile bike rides three to four weeks out from the Ironman World Championships, or doing any highly oxidative training for long periods of time, makes zero sense if the athlete has already developed their ability to use oxygen effectively. The solution is to strength train and make them work at faster than normal speeds (i.e., speed training and intervals), while retaining the ability to recover.

When I talk about strength training, here’s what I mean. Most of the time, we squat every week, doing sets of ten at 80 percent of max, then adding five pounds for eight reps, then adding five pounds for six reps. This usually scares the newbie endurance athletes to death, but they get over it soon because we won’t train them any other way. They learn that the strength training actually speeds up recovery and lets them get back to training much sooner than they thought.

Speaking of recovery, that’s the next limiting factor we have to work on with distance athletes. Most of them are training exclusively in the oxidative pathway, and highly overdoing it at that. Even if you are just training this way, would it not behoove you to have the ability to actually recover from these workouts so that you could actually benefit from them? We make each of our athletes recover to a heart rate of 120 in less than two minutes when doing intervals or hill work. If they can’t recover, then the

workout is done. Walk away! When they run pace work, nothing is more than a half marathon so that they have the ability to go out and actually train the next day with purpose.

Energy is the primary factor in this type of training. We have to be able to look at the individual’s energy and see how much they can handle, at what speeds they can handle it, and how much weight they can move. All the while still having the ability to get up the next day and do four to eight one-kilometer repeats at a 5:00 mile pace (if this is what they can handle), and then be able to do “Helen” the next day and at PR or near-PR levels. As I stated in the beginning, much of this is about the psyche and your ability to believe you can handle more (and different) than you ever have. Don’t just go out and expect a change tomorrow. This is something that will take learning and patience like anything else. Now if you are convinced you have the ability—oh, the possibilities that await you!



Brian MacKenzie is an expert in strength training for endurance athletes as well as a coach for Multisports Orange County. He currently holds a double certification through the International Sports Sciences Association (ISSA, CFT, and SSC) and is a level-2 POSE-certified running coach. In addition to owning [CrossFit Newport Beach/Genetic Potential](#), Brian founded and operates one of the only internship programs for professional trainers in California.