

Training for Track Racing

By Mark Rodamaker

Training for Track Racing is not dramatically different from training for road racing. However, it is not clear that everyone understands how to train properly for road racing. Track racing can be categorized as sprint or endurance and, in fact, the US National Track Team is composed of these two parts with different riders and coaches. Track Sprinting is unlike any other cycling event. Track Endurance Racing is rather similar to criterium racing. I find the easiest way to explain proper track training is to start with an explanation of the human body energy systems.

Energy Systems

When a muscle contracts, it generates force and attempts to become shorter. During this process it burns ATP. Without ATP, the muscle will be unable to generate any force. The human body has three energy systems that deliver ATP to the working muscles. The muscle does not care where the ATP came from. There are also two kinds of muscles; fast and slow twitch. The fast twitch muscles are stronger but are less efficient. They can produce a lot of power but consume ATP at a very fast rate. The slow twitch muscles produce less power but they are more efficient. Each of us has a mix of fast and slow twitch muscles that can only be altered slightly. If you don't like your mix, you should have picked different parents.

If you are rested and attempt to do something very strenuous such as an all-out standing start on a track bike, ATP will come from the ATP-PC system. Sometimes this is also called the ATP-CP system. It is unique in that it does not really deliver ATP to the muscles. Instead, it uses ATP that are already stored in the muscles or very near them so the ATP is instantly available. The limits of the ATP-PC system are how fast the muscle can burn it and how much ATP is available. The ATP-PC system is most effective when used with fast twitch muscles. In an elite sprinter, the available ATP will be gone in about 10 seconds so it is a very short burst but peak power levels of over 2000 watts are not uncommon. No other energy system can produce nearly this amount of power but it is only useful for short efforts and it takes minutes to reload so it can be used again. Sprinting is almost totally driven by this system and this is why most sprints are contested over around 200 meters as this is how far an elite sprinter can go in 10 seconds. Sprint training concentrates on developing the ATP-PC system and does not worry too much about the other systems.

If you are reasonably rested and do a maximal effort that takes between 1 and 3 minutes, the majority of the ATP will come from the lactic acid system. This system delivers ATP to the muscles anaerobically which means it does not need oxygen. The muscles are working very hard and are producing lactic acid faster than your system can clear it so power output may be limited by lactic acid buildup. That is the burning sensation you may feel. In any case, this system can produce ATP at maximum rate for less than 3 minutes. Racers who do events where the hard effort last 1 to 3 minutes need

to develop this system. The racers with the best developed lactic acid system are probably kilo racers. They can produce well over 1000 watts for more than a minute.

If you do an effort that is longer than 10 minutes, most of the ATP comes from the aerobic system. This is the system that road racers work years to develop. It is important in endurance track racing but not as much as in road racing. Energy from the aerobic system can last for many hours but it is extremely rare for aerobic power output to approach 500 watts.

Training for Sprinters

Sprint events on the track are match sprint, keirin and possibly the kilo. Really, the kilo should not be grouped with sprinting as the kilo is mainly a lactic acid system event. A good kilo rider may be only average at the sprint and a sprinter may find the kilo to be too long. Sprinters are mainly concerned with developing their ATP-PC system. To do this, they will do a lot of short but very intense efforts typically around 10 seconds in duration. This will increase muscular strength of the fast twitch muscles and increase the amount of ATP available. Creatine supplementation may be useful. It is important to allow enough rest between efforts for the ATP to be replenished. If the effort is really intense, such as a flying 1 lap effort, it may be useful to rest for 10 minutes before doing another one. If the effort is relatively short, such as a 100 meter jump, then the rest period may be 2 to 3 minutes. Weight training is also useful for track sprinters and this means heavy training of the legs. It has been said that a track sprinter is a weight lifter who also rides a bike. Much of this information was taken from an article by Paul Rogers who is the Strength and Conditioning Coach for the Australian National Sprint Cycling Team. He strongly recommends single leg presses. A typical weight workout would have a short aerobic warm-up, heavy single leg presses, some back and abdominal work, some upper body work and a short aerobic cool-down. You might do squats instead of the leg presses once a week and you would do this workout 2 or 3 times a week. The upper body work is alternated so you exercise your total upper body once a week. You also do short efforts on the bike 2 or 3 times a week. This might be at the track or on a road bike during the off-season. You may also do weights and sprints on the same day. Weights are the best way to develop strength but you also have to spend time on the bike doing intense work to maximize the transfer of weight developed strength to making you fast on a bike. Doing hard road rides is considered to be counterproductive. Doing hard road rides expends energy without making you faster and may make you slower. If you are going to be a track sprinter, you will not be road racing. I have personal experience in this area. For the last two years, I did a lot of road base miles in the winter. My endurance was better and it was really good for weight management but I never got really fast in the summer. This year, I am following the basic plan outlined above.

Training for Track Endurance Events

There are a wide variety of track events even after you exclude the sprint specific ones. Every Friday Night at Hellyer has 4 endurance events for 3 different groups. Some examples are a scratch race, a points race, the miss and out, the win and out, the snowball and the Madison. There are also endurance events that we only contest at District Championships or possibly Nationals for some of you such as pursuit and team pursuit. The shortest of these events will be around 6 laps or 2 kilometers which will take around 3 minutes. The longest event may be 100 laps and could take 45 minutes. To do well in a long event, you will need to train your aerobic system. If you are doing road or crit racing, you will already be working on this. The general coaching opinion on how to improve your aerobic system is to do a lot of winter miles with your heart rate at 60% to 70% of your maximum. These are called base miles. Then, as you get within a few months of racing, you start doing shorter but harder aerobic efforts. You need to know your anaerobic threshold (AT) to do these effectively. Start by doing 10 to 20 minutes 5 beats per minute (bpm) below your AT (AT-5). Increase the time or number of sets for a while. Then do some efforts closer to you AT, then right at your AT, and then a little above. These are really hard efforts so don't do too many. Many riders become sprinters just so they can avoid efforts like this.

Much like a fast crit, there will be times in an endurance track event when the pace goes really fast for a few laps. You need to have developed your lactic acid system to survive these times. The pace almost always goes up toward the end of any race and you'll need your lactic acid system then also. In training, doing hard efforts that take 1 to 3 minutes is one good way of getting there. Doing lots of racing will also work. Some riders prefer actual racing but others like the structure of a workout. You will need to learn the tactics of racing at some time and you can never be too good tactically. Wednesday and Thursday Night racing start a month before Friday Night. You may find doing one of these is your favorite way to get fast.

There are no hills, sharp turns or chasing dogs in track racing so most of races finish in a sprint. You will have to train your sprint if you want to win a group finish. Doing 10 second efforts just like a sprinter is the best way to develop this system but an endurance rider will typically do these only once a week and will not do weights nearly as hard, heavy or often. There is some question as to whether an endurance track racer should do weights. As you get older or want to improve your sprint, adding weights becomes more advantageous. But, you will add some muscle mass that will hinder your hill climbing and will not improve your speed over many laps.