



Power Training. Powerful Results! **PEAKS COACHING GROUP**

Name of Article: Going Uphill Fast With Power*

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Climbing and time trialing are the two most difficult aspects of road cycling. When the road turns seriously up, drafting plays a very minimal role, as each individual's true ability is exposed. The first mountain stage of any Tour de France illustrates this, as riders are spread out all over the mountains while each rider climbs to the best of his ability. The best climbers make going uphill look effortless, even though their bodies are in terrible pain.

What makes a great climber, especially in the mountains, is an excellent power to weight ratio. Power to weight ratio has two components: first, the ability to ride for long periods of time at a Maximum Sustainable (MS) power. Typically a top climber can ride at 10% or more, above threshold power (or heart rate) for 30-60 minute. Second, a low enough body weight so that the MS power translates into an advantage going uphill. Having a high maximum sustainable power output will make an excellent time trialist on flat roads where the main obstacle is wind drag. To carry over this advantage to climbing, you need a low enough body weight in relation to your MS power. This is especially true on long and steep climbs. On short climbs of less than 5 minutes so called "none climbers" can still make it over with the front riders with their very high MS power even though they may have an inferior power to weight ratio, due to their heavier body weight.

The 1996 Tour de France winner Bjarne Riis* illustrated how much body weight can make a difference while going uphill. Riis beat the great Miguel Indurain in 1996. At the time of his win he weighed 150lbs (68kgs) and had a MS power of 480 watts while going all-out on a climb or time trial. This gave him an incredible power to weight ratio of 7 watts per kilogram ($480 / 68 = 7$). 7 watts /kg is widely regarded as the magic number in order to be one of the world's best. Indurain had a MS power of 550 watts when going all-out, a much higher number than Riis. However, he weighed in at 176lbs (80kgs), 26lbs heavier than Riis! This gave him a power to weight ration of 6.8 watts/kg ($550 / 80 = 6.8$), 0.2 less than Riis. Indurain's much higher MS power gave him the advantage in the time trials, where the main obstacle is wind drag. However, on the longest, steepest climbs of the Tour this was not the case as Riis's 0.2 watts/kg advantage, made all the difference.

A few years before his Tour win, Riis's story was quite different. He was a good professional, nothing more. At the time he weighed 165lbs (75kgs), 15lbs more than his tour winning weight. Riis was slightly overweight for a pro cyclist and could loose some body fat. With the help of a great coach he not only lost 15lbs (over a few years), but with a new, more scientific training program he was able to increase his MS power, making him unbeatable in the 1996 Tour. Some cyclists are already at 4-5% body fat (for men), and in this case the only improvements they can make to their climbing is by increasing their threshold and MS power. It is dangerous for a cyclist

to try loose weight at a low body fat percentage.

Next we will divide climbs into two categories; short climbs and long climbs.

Short Climbs and power

Short climbs can be anywhere from 45 seconds - 5 minutes in length. In the One-Day Classics there are numerous short, steep climbs, which wear down the riders. Some criteriums or circuit races in the US incorporate short climbs. These short climbs reduce the field by the end, and serve as an ideal launch pad for attacks.

The typical approach to a short climb in a race scenario is big-gear, out-the-saddle, near maximum effort. The pros will ride at 10-20%+, above their threshold power, and repeat this near maximum effort many times in a race. On short climbs being a typical pure climber (slight build with an excellent power / weight ratio) is not always an advantage over a heavier but more explosive rider with a very high MS power over short climbs. This explains why a race like the US Pro Champs is never won by a "pure climber", but usually by a sprinter or so called "none climber", even though there is a very steep, but short climb, repeated 10 times.

The physical attributes required to go up short climbs fast are the ability to sustain a very high MS (15-20%+, above threshold) over the duration of the climb, and the ability to do this repeatedly (have excellent recovery).

Training for races with short climbs is about simulating the kind of effort required in training. This kind of training is very hard and should be done sparingly; it has its place in the final 2-3 weeks before an important, hilly race.

To simulate a race climb do a short, steep climb (30 sec to 3 minutes) as hard as you can for the duration of the climb (15-20%+, above threshold), repeated 3-6 times. Race simulation hill repeats should only be attempted when fully recovered and the day after is best done at a low, recovery intensity.

Other components of going up short climbs fast are the ability to apply a high amount of force to the pedals, good explosive power, and an excellent capacity to recover.

To increase your ability to apply force to the pedals do some very big-gear, seated climbs, repeated 5-8 times. Stay well below your threshold power (75-85% of threshold), and focus on pure muscle force to the pedals at a very low cadence (50-60 rpm).

To increase explosive power do big-gear, standing starts or hill sprints of 6-8 seconds or 10-12 pedal revolutions, repeated 8 times.

To increase the ability to recover do 5 minutes intervals, repeated 3-5 times, with 40 seconds at 20%+, above threshold, followed by 20 seconds recovery.

Long Climbs and power

Long climbs can be anywhere from 5 minutes - 60 minutes in length. Long climbs (or mountains) are typically found in the big 3-week tours in Europe. The average race in the US rarely has long climbs.

The typical approach to a long climb in a race scenario is an initial, big acceleration by the strongest riders, to eliminate the weaker riders in the first few miles. Once the damage has been done there is a momentary break in the attacking (0-10% above threshold), as the front riders recover from their initial acceleration. The top climbers don't need much time to recover and soon the attacking will resume (10-20%+ above threshold), as they try to break the rhythm of riders who prefer climbing at a constant rhythm or pace.

The physical attributes required to go up long climbs fast is an excellent power to weight ratio. A top climber needs a high MS power in relation to body weight and needs to be able to ride at MS power over long periods of time, typically 30 minutes - 60 minutes.

Training for long climbs is about riding long climbs or mountain passes often, to train muscles for climbing. Excellent training is 10-30 minutes climbing intervals, seated, and at high cadence, slightly below or at your threshold power, repeated 2-3 times. The maximum benefit gained in this kind of training is by reducing the intensity just below threshold and increasing the duration of the interval.

2-3 weeks before an important, mountainous race introduce some shorter climbing intervals of 5-15 minutes, at 5%-10% above your threshold, repeated 3-5 times. To practice changing rhythm while climbing alternate between climbing seated spinning at threshold for 1 minute, then climbing out-the-saddle in a big gear, 5-10% above threshold for 1 minute.

Tips to becoming a better climber

Increasing your Maximum Sustainable and threshold power output. The right type of training for the right type of climbs. A good coach will design the best training program to improve your climbing. Training for climbs should only be attempted once a rider has a well-developed aerobic engine.

Increasing your power to weight ratio by reducing your body fat (for those of you who can lose a few extra pounds). How serious are you about improving your climbing?

Mental training (visualization) to help approach climbing with the right mental attitude. How hard are you willing to push yourself? Staying concentrated. Training to stay concentrated, relaxed, and focused in the present moment ("in the zone") while going all-out on a climb. It is pointless contemplating how far you still have to climb when suffering terribly at the beginning of a climb!

Pack positioning. In a race, staying near the front of the pack to ensure you start a climb in a good position and reduce being caught out when riders start to leave gaps when dropping off.

Reducing bike weight. This won't have as big an effect as most cyclists would like to think. Most bikes are fairly light these days. What is far more important is the correct training and increasing your power / weight ratio.

Simon Kessler is a PCG coach and a former 6-year professional cyclist with over 17 years of cycling and racing experience. In 2001 Simon coached one of his clients to win the Bronze Medal at the World U23 Time Trial Championships.

Since this article was written Bjarne Riis has admitted he was using banned substances during the time period of this race win. We do not condone any use of banned substances and pride ourselves in creating clean athletes that succeed!



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