

The Key to Climbing is Cadence

Pedal Cadence - Learn to pedal faster on climbs. A lot has been made of this since Lance Armstrong started winning the Tour de France using a high cadence on the climbs. The technique works because it shifts some of the work of climbing from the leg muscles to the cardiovascular system. You can create the same overall power output whether pedaling quickly or slowly, but the more quickly you pedal, the less force you have to exert during each pedal stroke. However, there is an energy cost to pedaling faster. Increasing your cadence burns a lot of oxygen because you have to contract all muscles necessary for a pedal stroke more frequently. But because there is plenty of oxygen in the blood and the increased demand for oxygen is spread among many muscles, each can get the oxygen it needs for continued contractions without resorting to anaerobic metabolism (using carbohydrate stores for fuel). Producing the same amount of power with a lower cadence is problematic, because muscular fatigue sets in quickly as lactic acid builds up in leg muscles ('the burn'). Skeletal muscle fatigues in a different manner than the cardiovascular system does, and given the choice between increasing the load on skeletal muscle or on the cardiovascular system, choose your heart and lungs over your legs. Breathing faster and raising your heart rate increase the amount of energy you burn, but with proper nutrition and hydration your cardiovascular system can support the increased load far longer than your leg muscles can. Staying aerobic longer mean accumulating less lactic acid and sparing muscle glycogen (fuel from carbohydrates), both of which help you stay fresh for the end of the ride and recover more quickly afterward.

Body Position – The most economical climbing position is seated with your hands on the tops of the handlebars, as I demonstrated last week. Since the saddle is supporting a lot of your body weight, your cardiovascular system does not have to supply oxygenated blood to as many working muscles as when you are standing on the pedals. Not only is your heart rate lower, but you can also breathe more easily because your upper body is not all crunched up. As a result, you are increasing the amount of oxygen you are taking in while limiting the body's increase in demand for oxygen. You may find that it takes time before you can tolerate staying seated for long climbs, but the benefits are well worth the training required.

When you do have to stand up on climbs, it is usually to stretch or accelerate. In either case, shift into a higher gear before rising out of the saddle. When you stand up you can take advantage of your body weight as well as the power in your legs, meaning you can push a bigger gear. Your cadence will decrease when you stand as well, so pushing a bigger gear is necessary to maintain your speed. One word of caution here – be aware of riders around you when you stand. You and your steed will slow slightly when you get on the pedals, and a rider behind could run into you in this case. Simply say 'Standing' if you are concerned about a rider that may be close to you. Conversely to standing, shift back into a lower gear when you return to the seated position, and increase your cadence.

Descending – The best descenders are smarter, not necessarily more courageous. Safely maneuvering down a hill is a matter of skill (I'm a poet and I didn't even know it!), and you don't have to be a daredevil to descend well. Relax and move smoothly over the bike. The more tightly you grasp the handlebars, the more skittish your steering becomes. Descend with your hands in the drops of the handlebars to ensure that there is sufficient weight over the center of the bike. When turning, you should plant your weight on your outside foot and lean slightly into the turn. The bike should be doing all the leaning underneath you, to the point that it should be difficult for me to tell that you are turning as all if I am looking only at your body.

Everything happens faster when you are going downhill (rocket science, huh?!?), and your reaction time has to adjust accordingly. Look far ahead for obstacles or upcoming corners because you don't have near as much time to prepare. Remember that slight handling adjustments are amplified at high speed. The faster you are going, the less drastic your movements should be.

Pedaling on descents is also a good idea – not so much to increase your speed as to keep the blood circulating in your legs and return it to your heart. Your body takes care of itself in terms of circulating blood to your muscles and organs, but after hard efforts, your circulation slows a bit and blood pools in your lower limbs. That blood is not oxygenated and contains a lot of lactate, so your body wants to get it back to the heart and lungs as quickly as possible. Your legs will feel fresher at the bottom because light to moderate pedaling downhill has helped clear out the lactic acid that accumulates during the climb.

Power to Weight Ratio (aka – The Battle of the Bulge) – Not much to report here, but when that one scientist guy saw an apple drop off a tree a long time ago, we figured out what gravity was. And when you are climbing, you are working against gravity. Naturally, if you carry less weight (on your bike or on your body), climbing becomes easier. Eat right, train right, rest right – oh heck, just treat your body right and watch what a difference just a small caloric deficit can make. 'nuff said.

“Hills Are Fun” – You can make them fun by knocking them off a piece at a time. Choose road markers as intermediate goals as you make your way up a hill – a street sign, a mailbox, a dead squirrel – it doesn't really matter. Small victories will lead to huge successes.

There is also a little known ailment called 'climb-o-phobia' which experienced by some riders. Climb-o-phobes have already determined the difficulty of a climb many days before they get there. Then when they actually see the hill, it is much greater than they ever imagined. Poppy-cock! Your mind is the best tool you have; it can just as well be used to look upon climbing as a positive, goal-setting exercise. Before and during the ride, visualize yourself dancing up the hill just as you ride on the flats. Trust me – it works.