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# Ask the Expert

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exercise endurance; (b) strength training can increase both high intensity exercise endurance and low intensity exercise endurance, the effect being greater for high intensity exercise endurance; (c) the volume of strength training plays a role in endurance adaptation; and (d) mechanical specificity and training program variables also play a role in the degree of adaptation.”

**Q** I am currently a competitive category 4 road cyclist. Will the incorporation of a weight training program enhance my cycling performance?

That is a good question and the more competitive you get in cycling, or any sport, the more difficult it is to make improvements. Because this phenomenon occurs in all athletic competition, athletes often look to supplement conventional sport-specific training with alternative methods of training, like strength training. The impact a strength training routine will have on your performance will depend on a few different factors but I can confidently tell you that a properly incorporated strength training routine will complement and improve your performance.

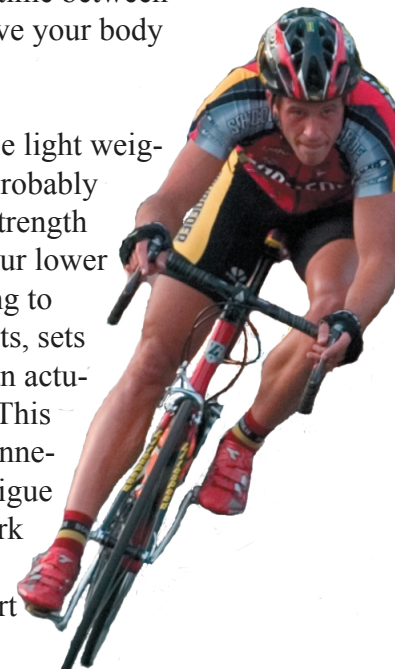
In a recent article published in the *Journal of Strength and Conditioning*, several prominent researchers, including those at the United States Olympic Committee and from Edith Cowen University in Australia, reviewed current literature on the concept of incorporating strength training into endurance performance. After their review of the literature they made several statements.

“Endurance can be defined as the ability to maintain or to repeat a given force or power output. The sport performance–endurance relationship is a multi-factorial concept. However, evidence indicates that maximum strength is a major component. Conceptually, endurance is a continuum. The literature indicates that (a) maximum strength is moderately to strongly related to endurance capabilities and associated factors, a relationship that is likely stronger for high intensity exercise endurance activities than for low intensity

In the case of road cycling these conclusions mean, yes indeed, some strength training incorporated into your training will likely have a moderate effect on your performance. I would like to give you some training advice that will help you get started.

If you have not done any strength training in the past you will need to start slowly with incorporating the routine. This should be done in the off-season and two to three times per week would be adequate. Additionally, you will want to leave two or three days of rest between your strength training. This means that if you lift on Monday your next strength training day will be either Thursday or Friday. This additional time between training sessions will give your body time to recover.

It is important to also use light weights to get started. You probably have some fairly good strength already, especially in your lower body. It may be tempting to really load up the weights, sets and reps because you can actually perform the work. This will probably result in unnecessary soreness and fatigue that can impair your work on the bike, so I would recommend that you start with one to two sets per



exercise the first two weeks. You may feel a little soreness at first but that will go away as your body becomes more accustomed to the movements. The goal of your strength training routine is to *complement* your cycling performance, not complete with it.

I would also recommend that your strength training routine focuses on the lower body and torso. These are the more important muscles that you use while cycling. Additionally there is little need to haul around a big upper body and that could ultimately slow you down.

As you become stronger and more confident with your strength training routine you will need to add heavier weights and more sets. This means that your strength training routine will go from two days per week to three. Again, train on non-consecutive days like a Monday, Wednesday, Friday routine.

Your off-season routine may look something like following:

Monday	Wednesday	Friday
Squats	Lunges	Squats
Hamstring Curls	Straight Legged Dead Lifts	Hamstring Curls
Seated Calf Raises	Toe Raises	Seated Calf Raises
Bench Press	DB Bench Press	Bench Press
Pull Ups	Pull Downs	Pull Ups
Abdominal Work	Abdominal Work	Abdominal Work

You should also perform your strength training routine after your cycling in-season. You may be a little tired after training but you don't want to waste your high quality training in the weight room in-season.

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If all of this information with exercises, sets, reps and time of season seems daunting I would recommend that you find a qualified strength and conditioning professional in your area. They can assist you in setting up your routine, proper technique and monitor your progress. Look for someone who has a degree in exercise science, is certified as a Certified Strength and Conditioning Specialist and has some experience working with athletes, preferably cyclists.

Good luck.

**Michael Barnes, MEd, CSCS\*D, NSCA-CPT\*D** earned his Masters degree in Human Performance from Auburn University. Mike most recently served as the Education Director for the National Strength and Conditioning Association and is certified with distinction as a Certified Strength and Conditioning Specialist and a National Strength and Conditioning Association Certified Personal Trainer. Previous work experience includes, a Division I Strength and Conditioning Coach, Strength and Conditioning Coach for USA Rugby and seven years as the Strength Development Coordinator for the San Francisco Forty-Niners. Mike is a popular national speaker on strength and conditioning and has authored numerous publications as well.