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Off-Season Training



FOR
ROADIES

By Fred Matheny

RoadBikeRider.com



Off-Season Training for Roadies

By Fred Matheny

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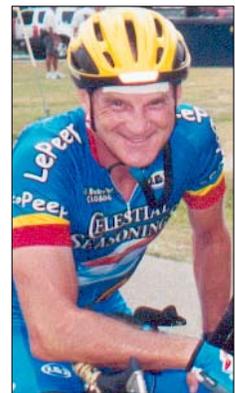
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About the Author

Fred Matheny has served as vice president of RBR Publishing Company and written for its RoadBikeRider.com website, newsletter and eBook division. He's the author of *Fred Matheny's Complete Book of Road Bike Training*, coauthor of *Andy Pruitt's Medical Guide for Cyclists* and he's written several RBR eBooks on training.

Fred began riding in the early 1970s after an athletic career that included football and track in high school and football at Baldwin-Wallace College in Ohio. He was B-W's Outstanding Offensive Lineman and an all-league selection.



Fred's interest in off-season training began with football. By hitting the weight room from December to August (and drinking enough milkshakes to float a battleship), he gained 50 pounds and converted himself from a high school receiver to a college guard. As a 12-month athlete, he was able to compete with larger, more talented players who didn't work as hard.

The Cleveland Browns broke his heart when they didn't draft him, but even in 1966 there wasn't much demand for 205-pound pro linemen. After he moved to Colorado in 1970, cycling helped him lose that suddenly unnecessary 50 pounds. He enjoyed riding so much that it soon became his passion.

Fred rode his first race in 1976 (the Iron Horse Classic from Durango to Silverton). A category 2 racer since '78, his top results include a cat 3 win in the Mount Evans Hill Climb, a world record of 5 days, 11 hours in the 1996 Team Race Across America (with Skip Hamilton, Pete Penseyres and Ed Pavelka), the Colorado Masters Time Trial Championship, and third place in the 2000 Masters National Time Trial Championship.

He has written about cycling for 30 years, including eight books and hundreds of articles. Many were for *Bicycling* magazine, where he served as Training and Fitness Editor for five years. One book (*Weight Training for Cyclists*) and many articles were on various aspects of off-season training. During research, he interviewed (and rode with) many of the world's top racers, coaches and exercise physiologists. He also has coached at numerous cycling camps.

Although Fred lives at 6,000 feet in western Colorado, winter is his favorite season to ride.

"It's cold," he allows, "but the pavement is usually dry, the air is clear and the back roads are lined with wildlife—eagles, deer and elk. And it's the start of a new season. Cyclists are eternal optimists. No matter how we did in last year's races or important rides, we know we can do better. The off-season gives us time to hone our training and get it right for the coming summer."

Introduction

Why train in winter?

"The off-season is the most important training period of the year. It's when you make your biggest gains. Lance won the Tour de France in November, December and January."

➤ *Chris Carmichael*, Lance Armstrong's coach

“Winter training is the time when a rider can make a difference in his preparation for next season. It’s the only time of year when a pro can work on fitness for three consecutive months without the stress of racing and traveling.”

➤ *Max Testa, M.D.*, former pro team physician

Cycling is traditionally a summer sport. Feeling the breeze on your bare legs and the sun’s warmth on your back is as much a part of riding a bike as lubing your chain. There’s something deeply wrong, many casual cyclists would argue, about riding in the cold with snowflakes sticking to your sunglasses.

Traditionalists may contend that you need a break from training. Do something besides ride in winter, they counsel. Run, ski, play basketball. Wean yourself from the bike, and from serious exercise, to build enthusiasm that will carry you through the three seasons of cycling. In this view, only serious racers should train all year round—and only because they are getting paid to do so.

It’s certainly true that year-round training has been a key reason for the higher performance of pro riders. As recently as 15 years ago, European pros got off the bike in September and started training again in January, often having gained 10 or 15 pounds. They put in a desultory 2,000 miles and used early-season races to “ride into shape.” Eager neo-pros who went off the front were sternly chastised for their irrational exuberance. They soon learned to slow down and play the game.

That relaxed approach to winter has changed dramatically. Eric Zabel, six-time winner of the Tour’s green jersey, is famous for riding as many as 8,000 miles between seasons and coming out strong in spring classics. Time off the bike has shrunk from three months to three weeks—and those precious three weeks aren’t consecutive but are spread through November and December.

No one focused on the off-season with more intensity than seven-time Tour de France champion Lance Armstrong. It’s worth hearing coach Chris Carmichael again:

“Lance won the Tour in November, December and January. Many riders say the season is over in late fall, but the off-season is when you make your biggest gains.”

But what about us recreational riders? Why should we train—on the bike and maybe in the weight room, too—in winter? We’re not pros. No one is paying us to ride. Our goals are much more modest than winning the Tour. Most of us want to complete a century ride, hang with the lead group in the local Sunday morning hammerfest, maybe get on the podium in age-graded racing.

Of course, you can take the winter off and still have fun riding next summer. You can even achieve modest cycling goals. But it’s a lot more effective—and better for your health—if you stay in shape and even increase your fitness in the winter. And believe it or not, off-season training can be just as much fun as riding during the traditional cycling months.

Here are 10 good reasons to train through the calendar:

1. Expand your cycling season. I bet you like to ride—you wouldn't have purchased this eBook if cycling didn't rate high on your list of preferred activities. So why stop doing one of your favorite things for several months just because it gets cold, wet or dark early? With the right techniques, clothing and equipment, cycling can be a year-round activity at latitudes only polar bears could love.

2. Preserve last season's fitness gains. If you finished the season flying—or at least feeling good—it's depressing to think about all that hard-won fitness disappearing during the winter.

The “use it or lose it” syndrome is at work here. Exercise physiologists call it “detraining,” and some studies show that it occurs with frightening rapidity. Several aspects of fitness—power output in short efforts, for instance—can tail off in just a few weeks of not training.

EXAMPLE! In a study of 16 cyclists done at Florida State University, their VO_2 max remained high despite much less time devoted to exercise during the winter. Only anaerobic power (sprinting and steep climbing) declined significantly.

But these riders weren't completely sedentary all winter. They did other aerobic sports such as running, and some were in the weight room. Also, many of them rode, albeit at a lower intensity and volume than during the season.

The bottom line: It doesn't take much activity in the off-season to keep fitness from vanishing. But maintaining fitness—or increasing it—requires a bit more investment in time and effort.

3. Avoid weight gain. In the above-cited study, the cyclists averaged 11.6 percent body fat at the end of winter—about 2 percentage points higher than would normally be expected in riders of their age and category. That's not extreme. Moderate weight gain (3 to 5 pounds) can actually be good because it provides reserve energy for demanding spring training.

Greater amounts of winter lard are best avoided, however. The time it takes to ride it off with long and relatively slow early-season miles could be better spent honing speed and power. Carmichael states this limit: “It isn't advisable to gain more than 10 pounds over the winter.”

EXAMPLE! We need look no further than Jan Ullrich to see the danger of too much winter weight gain. The German has made a career out of finishing second in the Tour de France even though he's been called the most talented rider in the peloton.

Ullrich traditionally packed on 20 pounds during the same period that Lance was doing his effective winter program. In the early season, Ullrich showed up bloated and struggling to ride off his excess weight so he could be competitive again, especially on climbs.

By Tour time in July, Ullrich was back to racing weight, but Lance had been there for months. That's one difference between winning and losing.

4. Improve your riding skills. Winter is a great time to practice the bike-handling techniques necessary to feel comfortable in testy conditions. Riding an old bike on snow or through the

mud of a cyclocross course teaches you how to relax when the rear wheel skids. Get a few friends together for snow criteriums in a frosty field, and I guarantee that come spring, the wettest, slipperiest roads will seem tame in comparison.

5. Avoid SADness. Does winter make you depressed, sap your energy and give you an advanced case of cabin fever? Seasonal affective disorder (SAD) is a common affliction of people in northern latitudes. It's related to lack of natural light, so getting outside to exercise is one of the best ways to beat it.

What a deal—stay fit and lift your mood all at once!

6. Boost your confidence. Belgium has the most depressing winter weather imaginable—an endless round of cold rain, sleet and wet snow. Yet Belgian riders train through the worst that northern Europe has to offer. In the spring classics (usually in the same abominable conditions), they regularly beat up on riders who spent the winter putting in their miles in balmy Mediterranean climes.

Training in abysmal conditions makes Belgians tough. Indeed, there's a name for these masochists, *flahutes*, meaning hard riders who revel in wretched weather. It also makes them great bike handlers in slick conditions, a skill that comes in handy on the slimy cobbles of springtime race courses.

EXAMPLE! Andy Hampsten, who often trained in sleet and snow in Colorado, won the 1987 Giro d'Italia on the climb over the Gavia Pass in a snowstorm. It was so slippery and cold that most of the field abandoned or rode merely to survive the stage. But because Andy was toughened by riding Colorado's passes in January or sliding through snowy trails on his mountain bike, he knew exactly how to handle the conditions.

EXAMPLE! It works for us non-pros, too. My RBR colleague, Ed Pavelka, has ridden through 20 winters in Vermont and Pennsylvania. He still remembers one eight-hour ride on a dark-gray February day when the temperature hovered at 34 degrees and a slushy snow fell throughout.

Ed told me, "I felt like a Belgian today." He got some fitness from that ride, but more important he got confidence. Even now, some 10 years later, he'll think about that experience when the going gets tough. Because he did that ride, he feels he can do any ride.

7. Enjoy riding more next spring. If you get out of shape over the winter, spring is going to be tough. You'll struggle to lose weight and struggle again to keep up with your friends on early-season rides. It can be dispiriting. But if you maintain and even improve your fitness, you'll be the one handing out the hurt.

8. Beat aging! Never let yourself get out of shape and you'll forestall most of aging's deterioration. Studies show that each year it becomes harder to regain your previous level of fitness after a period of inactivity. "Use it or lose it" goes double after age 40.

If you maintain your fitness, age-related deterioration can be minimized to nearly undetectable levels.

EXAMPLE! Sedentary people fall victim to a decline in VO₂ max (their ability to consume oxygen for energy) on the order of one percent a year after about age 35. But year-round training with an occasional dose of appropriate intensity can limit this loss to less than half a percent per year.

9. Add variety. What if you live in a climate where winter cycling is ideal? Maybe you're in Arizona, Florida or another place so hot in summer that the off-season is actually the most comfortable time to ride. The risk here is falling victim to overtraining and stalled enthusiasm.

Being able to ride all year is a double-edged sword. It helps you maintain fitness, but it can get boring and predictable, too. In this eBook, I'll show you how to vary your training with the seasons. This will help you remedy your weaknesses so you'll be fast and strong when it counts.

10. Realize your hope. Even racers who've had an abysmal year will be full of hope again by Thanksgiving. The off-season's three or four months of uninterrupted training can revive dreams and restore confidence. All cyclists, whether they compete or not, get an annual midwinter feeling that anything is possible next summer.

Unfortunately, all too often these dreams are followed by another season without that long-sought century PR, 10-mile time trial record, or sprint victory against weekend training buddies. Why? Because we tend to do the same ineffective training each winter. My brother Mike calls it "the futility cycle."

To misquote Alexander Pope:

*Hope springs eternal in the human breast.
A cyclist never is, but always to be, fast.*

But this winter will be different. With the information in this eBook, you'll learn how to train right during cycling's off-season—and come out flying in the spring. Think of it this way: When daylight savings time is gone, the temperature is plummeting and snow is in the forecast, it's the perfect time to train—correctly—for cycling.

Let's do it!

How to Use This Book

Off-season training is, in some very important ways, much more complicated than training during warmer months.

You have to deal with cold weather, for one thing. More sports are involved (because you'll be crosstraining), and this means learning new skills. Weight training introduces a whole new discipline to master. And as Chris Carmichael noted, the very importance of off-season training adds to the complexity. You need to do it right because it serves as the base for your whole season.

So, it's not enough merely to skim through this eBook and get started. You need a sequential plan of attack. The disparate elements must merge into a program that builds on your unique strengths and meets your personal goals.

With this in mind, the eBook is organized so that you can read about topics in the order you'll want to employ the information.

Before you begin off-season training, read about rest, goal setting and self-testing. Next come the tools for training—dressing for cold weather, resistance training, crosstraining, reaching ideal weight, and indoor cycling.

I include a separate chapter on how to build power by combining weights, high-cadence pedaling and intervals. And because bike-handling skills are such an important part of becoming a better rider, I devote a chapter to drills and activities to help you keep the rubber side down.

What about a training schedule? What should you do each day?

In Part Three, I tell how to set up 18-week off-season training programs for three different cycling interests:

- Fitness
- Recreation
- Competition

Because everyone has different goals and time available for training, I devote chapter 11 to general guidelines. These help you set up your personal program divided into six-week blocks. I include a sample week's schedule for each block.

After you read chapters 1 through 10, it will be easy for you to convert the principles in chapter 11 into an off-season program that's ideally designed for improvement.

Please remember that you don't have to start an off-season program on a particular date.

Normally you'll get underway sometime between early November and late December, depending on when the weather curtails outside cycling in your region.

But the program I present makes sense any time of year if your goal is superior cycling fitness or you have just started riding and want to get in shape. It's an effective fitness program no matter when it's used.

Part One

November & December

Getting Ready

Chapter 1

Rest, Recovery, Remediation

The most important way to prepare for a successful cycling season is, paradoxically, to rest thoroughly and well during the off-season. All good winter programs begin with a complete recovery from the rigors of the summer.

According to former Motorola Team physician Max Testa, M.D., “Pros start the winter with a two- to three-week vacation where they keep active, play a sport like tennis, and go mountain biking three or four times a week.”

Dr. Testa’s advice is just as good for recreational racers as well as riders who do centuries or just hammer hard while having fun.

Of course, maybe you didn’t have a “last season.” If you’re just beginning to shed a sedentary lifestyle and starting to ride, you can still jump into the training outlined below.

But if you rode substantial miles last summer and want next season to be your best ever, include the three R’s—rest, recovery and remediation—in your November and December training plan.

Rest

I have been using the word *rest* in its normal sense—relaxation that ranges from mild activity to slouching on the couch. But *rest* is different from *recovery*. As a result, in the remainder of the eBook I’ll be more precise and define *rest* as no training and no physical exercise at all, except for the activities of daily life.

Rest is the most neglected part of training. We have been schooled to equate improvement with hard work. In our success-oriented society, we automatically assume that the harder we work, the more success we'll achieve—and the faster it will come our way.

That's not what happens. Sure, it's important to keep your nose to the grindstone. There's no substitute for hours in the saddle, a precise dose of intense riding, and enough technique practice to keep you and your bike upright.

But hard work by itself is useless. On a week-by-week basis during the season, you improve only when your body has enough down time between one session of hard riding and the next. We improve while we're resting, not while we're out hammering ourselves into exhaustion.

For the same reason, at the end of the cycling season you should give your body a deep rest. This will heal any lingering physical problems (like saddle sores) and refresh you mentally so you're eager to get back on the bike.

Too many riders fall prey to the “flying in February, fried in July” syndrome. They are so eager to reach great fitness that they train hard all winter. They're out in the cold and gloom of January doing intervals. Or worse, they spend three months in their basement, suffering on an indoor trainer while watching old cycling videos and counting how many drops of sweat per minute cascade down their nose and onto the top tube.

No wonder they're mentally and physically fatigued just when the real cycling season begins.

Don't misunderstand—there's nothing wrong with indoor training. As we'll see in [chapter 9](#), carefully planned sessions on rollers or a resistance trainer can help you maintain and even improve your fitness. The trick, in your mid-winter enthusiasm, is to avoid overdoing it.

Listen to famed exercise scientist Tudor Bompa, Ph.D.: “The key isn't hard work, it's intelligent work.”

TIP! How many weeks of rest do you need? It depends on how hard your previous season was and how fatigued you feel as winter approaches.

Chris Carmichael recommends that “recreational riders take two breaks of two weeks each. One break should come right at the end of the riding season, and the other over the Christmas holidays. Don't take all four weeks at once—you'll lose too much fitness.”

Recovery

Okay, you're rested. But when you start off-season training, you must make time for *recovery* after exercise whether on the bike, crosstraining or in the weight room.

By recovery I mean “active recovery”—easy exercise that aids recuperation. The best recovery activities are aerobic. This may be walking or riding easily to do errands around town.

Unlike complete rest, mild exercise is thought to stimulate blood flow to tired muscles and improve how quickly they're ready for the next hard workout.

TIP! Dr. Bumpa suggests this after a hard training session: “Take 30 minutes for regeneration. Drink a carbo replacement beverage, lie down with your legs elevated, relax mentally, and do five minutes of self-massage.”

Remediation

Remediation means fixing things. Devote some off-season time to physical maintenance.

Now that you aren't training as much and have extra hours, see your doctor for an annual exam, get your eyes checked and visit your dentist. You don't want to train for months only to miss an important event because a vague ache in your mouth has become a raging toothache.

In Dr. Testa's view, “Winter is the time to resolve physical problems inherited from the previous season, and to prevent damage to overall health.”

Get all cycling-related problems fixed, too. Here's a list of common ailments that cyclists often brush off during the season:

Saddle sores. Cyclists usually continue to ride after they sprout small midsummer saddle sores. They tough it out—and a tiny pimple becomes a full-fledged boil. These lesions often calm down when riding tapers in the fall, but they may lie dormant and erupt again as off-season training begins.

Use the late-autumn break to eliminate these troublesome infections. Your doctor may prescribe antibiotics for moderate cases. Sometimes the boil has to be lanced, a procedure that should be avoided because it hurts like heck and it means you can't ride for two or three weeks.

Use any downtime to figure out what caused the problem. Is your riding position correct? Has your saddle broken down, putting pressure on one area and causing irritation and infections? Do you have a leg length inequality? Are your shorts old with a thin, worn chamois liner that's abrading your crotch?

PLUG! For detailed expert advice about saddle-related problems, bike fit, riding position, tendinitis and many other injuries, see the RBR eBook *Andy Pruitt's Medical Guide for Cyclists*.

Tendinitis. Knees are where tendon inflammation most commonly strikes cyclists. This irritating pain packs a double whammy: Once you're afflicted, it's hard to ride and it's difficult to do lower-body weight training, too.

The upper body is also at risk. Some riders suffer from tendinitis of the elbow (an affliction similar to “tennis elbow”) from leaning on the handlebar for hours at a time. This problem is

easily ignored during summer, but it makes weight lifting difficult in winter. As a result, sufferers don't do the strength training that might alleviate the problem—and the tendinitis gets worse as they start building mileage in the spring.

If you're struggling with tendinitis anywhere in your body, see a physical therapist, who will have various treatments to resolve the problem. Remember that it may take quite a while to relieve the pain and limited motion. The earlier you address tendinitis, the faster you'll be back training at full strength.

Suspicious skin spots. Cyclists spend months with substantial amounts of skin exposed to direct summer sunlight. No matter how much sunscreen you slather on, dangerous UV rays scald you every time you ride. When you have your exam, ask the doc to check your skin, especially areas exposed while riding—the back of your neck, ears, arms and legs. Beware of any unusual bumps, spots, moles or scaly places you notice.

Bike and Equipment Maintenance

Great! Your body is all checked out for next season. Feels good to know that, doesn't it? Now let's turn attention to your bike. You can inspect and service your own equipment or pay a good bike shop mechanic to do it for you.

Inspect everything—frame, handlebar, stem, seatpost, derailleurs, brakes, cables, tires, wheels—everything. Replace anything that's suspect. Be especially vigilant with weight-bearing equipment: crankset, pedals, stem, handlebar, saddle, seatpost.

There are two times when you don't want an equipment failure—in the season and in the off-season. Having an important summer event ended by a malfunction is one thing. Being stranded far from home on a frigid winter day is potentially dangerous as well as frustrating.

EXAMPLE! Last winter I noticed a creak coming from my bike near the seat. I checked the saddle rails and even greased them where they contacted the seatpost clamp. But the vague squeak kept chirping in the background like a cricket in the basement. Soon I forgot about it.

Then one Sunday morning I was chatting casually in the paceline when my saddle suddenly tilted back. The nose pointed at the sky and nearly slid me onto the rear wheel. The top of the seatpost had sheared off.

Moral: Never ignore unusual sounds from your bike. Check the location carefully in strong light, looking for telltale cracks that might indicate material failure.

Service or replace the bearings—headset, bottom bracket, and hubs.

Purchase items that will wear out and need replacement—chains, cables, brake pads, tires, tubes, handlebar tape, cassette, maybe chainrings.

Get your clothing in order. Buy your shorts, jerseys, shoes, socks, gloves and other summer items during off-season sales. Also get the winter riding garb you'll need, depending on your climate.

Stockpile miscellaneous items when you see a good price. These are things like chain lube, chamois lube, sunscreen, lip balm, sunglasses, bottles, helmet, and so on.

Should You Hire a Coach?

This is one of the most important decisions heading into the off-season if you're serious about maximum improvement.

This eBook is dedicated to helping you make great strides without any extra guidance. However, Chris Carmichael argues, "Getting a coach is critical, and the program with your coach should start in the off-season."

Sure, Chris is in the coaching business as president of Carmichael Training Systems. You'd expect him to offer this advice. But although self-coaching has been the norm in cycling even among pros, we're realizing that having a coach is better. In other sports, coaches are accepted without question. Now more cyclists are beginning to see the light.

Why hire a coach when you can set up your own training program?

- If you're a beginning rider, a coach can spare you trial and error by teaching you the correct ways from day one.
- If you're an experienced rider whose progress has stalled, you can benefit from a coach's objective opinion. A coach can set up a new program to help you rise to the next level.
- Maybe you've taken on a big cycling challenge—a cross-state tour, the quest for a century PR or a season of racing—and you want to give yourself the best possible chance of succeeding. A coach who has worked with other riders having similar goals can customize a program based on your unique abilities.

EXAMPLE! Even experienced riders may find that a coach helps them improve. I learned this in 1996 when I was training hard for Team Race Across America.

I had raced for 20 years and written four books on training. Certainly I could set up the team's program. But I talked cycling coach Tom Ehrhard into developing a periodized training plan for our four-man team, and his insights helped us approach preparation in a new light. We went on to set a senior (50+) world record for the event, riding 2,905 miles from Los Angeles to Savannah in 5 days, 11 hours, 23 minutes.

Too often, experienced riders do the same training year after year. They need a fresh approach, an objective outsider to come in and shake things up. Coach Tom Ehrhard filled that role for us.

After all, if you keep doing what you're doing, you'll keep getting what you're getting.

How to Find a Coach

The governing body of American bike racing, USA Cycling, certifies coaches. Most work with non-racers and competitors alike. (www.usacycling.org)

In addition, your community may have highly qualified and experienced cycling coaches who have never taken the time to get certified but whose knowledge is outstanding. Check at bike clubs and shops for recommendations.

A number of excellent coaches offer their services over the Internet and by phone. Examples are Chris Carmichael (www.trainright.com) and Joe Friel, author of *The Cyclist's Training Bible* (www.ultrafit.com).

Chapter 2 Dreams, Goals, Limiters

I'll keep this chapter pretty short for two reasons:

First, I cover goal setting in detail in my RBR eBook, *Basic Training for Roadies*, so I won't repeat it here.

A more important reason: Most hard-driving, successful people have little patience with information on goal setting. Too visionary, they complain, and too vague—let's get started and I'll figure out exactly where I'm going later.

Still, it's important to have a clear goal in mind before you begin. Starting a company, building a house or figuring how to become faster and more skilled on a bike—the principles are the same.

Your Vision Statement

Start with a vision statement. It doesn't have to be *visionary* (often a derogatory term meaning vague and mush-minded). Rather, good vision statements are the basis for your goals,

helping you identify your destination. In the process, they save many false steps. Listen to Chris Carmichael:

“Forget the touchy-feely stuff. You want a long-term vision to direct your actions and emotions. If you were to drop dead tomorrow, what would you want people to say about you? That’s your vision statement.”

When Carmichael coached the U.S. National Team, they had this vision statement: “We’re 100 percent prepared, physically and mentally, to race to the full potential of the entire team.”

Here are more examples to guide you:

Fitness rider: “I am making a mid-life transition from being sedentary and unhealthy to becoming fit and strong, and my love of cycling is helping me accomplish this.”

Strong recreational rider: “I train hard but I don’t neglect the really important things—spending time with my family and having fun on my bike.”

Masters racer: “I’m an aggressive-but-sporting rider, not the most talented cyclist among my age-peers but I work hard and ride smart so I can be competitive.”

Write your own vision statement. Don’t agonize over it. Think about what’s important to you, on the bike and in the rest of your life. Then put those priorities into one strong sentence.

TIP! If you’ve thought long and hard and still can’t find the right words, go for a ride. Often our best thinking is done subconsciously while we’re doing something else—and there’s no better “something else” than the simple act of pedaling along with your mind wandering. Suddenly solutions to vexing problems appear, seemingly without conscious effort. Want to be sure you remember your mid-ride epiphanies? Carry a small tape recorder in your jersey pocket and capture them before they vanish.

Dream On

From your vision statement spring specific goals. They’re unique to you and your situation. But an intermediate step is often useful, so many riders start by listing their dreams.

That’s right, the kind of dreams that we had when we were young, beginning life and discovering something that we really liked to do. Remember those? Big dreams, dreams that were so unachievable when looked at rationally that adults would shake their heads and laugh if they knew what we were thinking.

When we’re young, we don’t share our dreams with other people very often. They’re too personal. They’re often unrealistic, too, but in that resides their charm and their power to help us achieve great things. Maybe not the things we dreamed in our innocence, but more realistic goals that suit our talents and our personalities.

Perhaps you aren't young any more, at least not that young. I'm not. But we can still have dreams, regardless of our age. Having something to shoot for keeps life worth living.

So take some time and daydream about cycling. When you do, what do you see? A warp-speed sprint? Climbing ability that puts the best Tour de France anti-gravity men to shame? Time trial power like a Harley? Go ahead—indulge your fantasies.

How to Set Goals

Okay, now come back to Earth. Dreams are a necessary precursor to goals. But unlike dreams, goals must be realistic. They should be set high but not out of reach.

Here are four simple guidelines you can use to set up your own seasonal objectives.

Goals should be achievable. Base your goals on your current performances. It's obvious that a top-10 finish in the Skunk Hollow Criterium last summer doesn't mean you should aim for the Tour de France podium next season. (In your dreams!) Goals should be based on dreams, but they're not the same thing.

For instance, if you rode the local 10-mile time trial in 26 minutes, don't set your goal for next July at 22 minutes. Unless you're genetically gifted and weren't really riding your best, you won't improve by four minutes. That's unrealistic. It'll be depressing when you fail to improve that much despite hard training.

Instead, set your goal at a reasonable level, say 24:30. With proper planning, a modicum of smart training and a good day at the event, you'll reach this goal and may even surpass it. Then, after glowing in the sense of accomplishment, you'll be fired up to set a more aggressive mark.

Goals don't need to be quantifiable. Goals aren't just for racers and they don't have to be timed or measured. Here's a perfectly reasonable goal: "This year I finished the cross-state tour exhausted and demoralized. Next summer I want to do the same ride and finish strong."

Beware, however, of goals that are so vague as to be meaningless. "I want to climb better," is one example. Better than what? In this case, numbers help. Aim to improve your time up the local killer hill.

Goals should be independent. Don't set goals that compare your performance to someone else's. For example, "I want to stay with Steve in the Thrilly Hilly Century Ride." What if Steve rides badly for physical or mechanical reasons? Your achievement is lessened. What if he doesn't even show up? All the work toward your goal becomes fruitless. Goals should always be aimed at improving what *you* can do, independently of others' achievements or failures.

For similar reasons, avoid goals that depend on an exact placing at an event, such as, "I want to win the district time trial championship." Winning or placing depends on your performance, of course, but it also depends on who else rides. No matter how strong you are, there's al-

ways someone, somewhere, who can beat you on a given day. If that person is home ill, or racing in a different event, or mowing the lawn, you win. If he shows up, you lose.

In the final analysis, every winner is lucky. When his performance gets him on the top step of the podium, it's because no stronger rider competed.

As novelist Joseph Conrad said, "Your strength is just an accident arising from the weakness of others."

Goals should not be too easy. Finally, don't undersell yourself. It's as bad to set goals too low as to set them too high. Cycling is a sport that rewards consistent, moderate and well-planned effort over a relatively long period. If your goals are realistic, you can get from here to there even if the gap at present seems unbridgeable.

Let's take the worst-case scenario. Suppose you are overweight, just quit smoking, a clumsy bike handler, and have no discernible athletic talent. You're slow on the flats and get off to walk even on mild climbs. You have the power of a three-toed sloth.

Hey—you have the whole off-season to get better. That's five months to turn things around. Economies have rebounded, dynasties have been overturned and scientific theories formulated in less time than that.

You can do it!

List Your Strengths & Weaknesses

In order to set specific cycling goals, you must isolate the skills that need improvement.

There's no reason to work on climbing if you drop everyone on hills, while on the descent you tend to fly over the bar into roadside bushes at the first hint of a turn. In this case, maybe you should focus on cornering. On the other hand, if you can sprint like a cheetah but get dropped on highway overpasses, a goal to improve your climbing is appropriate.

Cycling coach Joe Friel, in his excellent book, *The Cyclist's Training Bible*, calls weaknesses "limiters." I'll borrow this term because it's so descriptive and useful.

Deficiencies in any cycling skill limit not only your performance but also your enjoyment of the sport. You don't have to be a racer to benefit from better climbing ability or faster cornering. Doing these things well makes cycling more fun.

But what are your limiters? Where are your weaknesses? It's often hard to be objective about our shortcomings. Here are six ways to discover yours. When you have them pinpointed, you can develop a plan to turn limiters into strengths during the off-season.

Analyze when you leave your comfort zone. If you ride with a compatible group (meaning you can stick with the pace nearly all the time), pay attention to what happens that makes you struggle.

Do you get dropped on short, hard climbs that other riders sprint over in the big chainring? Then your limiter is explosive power.

Do you hang fine on short climbs but lose contact on long ones? You probably have an unfavorable power-to-weight ratio.

EXAMPLE! Two riders who both generate 300 watts at their lactate thresholds will get up a long climb at the same speed—if they're the same weight. But if rider A weighs 20 pounds more than rider B, rider A's 300 watts won't go as far. When the road tilts up, light and powerful is always better than heavy and powerful.

Do you always win the sprint to the city limit sign in the early going but fade near the end of the ride? Endurance is probably a weakness. Many sprinter-types, endowed with plenty of fast-twitch muscle fibers, often lack endurance. This problem may be more than just physical. There seems to be a "sprinter's mentality" that loves speed and short-term bursts but lacks patience for the long, steady rides that build endurance.

Analyze your technical skills. Physical prowess such as power or endurance is important, but so are skills like bike handling, following a wheel, and holding your position in the pack.

EXAMPLE! You'll waste energy if you can't ride behind another cyclist smoothly. Here's a typical technique problem: In a paceline you let a gap open through inattention, pedal hard to close it, then brake so you don't ride into the wheel in front of you. Repeated several times during a ride, it's amazing how much energy yo-yoing wastes. And this sort of squirrely riding certainly won't make you welcome in a group.

Get feedback from fellow riders. Training buddies are a good source of knowledge about weaknesses. They see when you ride strongly and in what conditions you falter. After all, if you lag behind they have to wait. If your bike-handling skills are suspect, they must be extra alert.

Consult your training diary. You do keep a diary, don't you? A simple log of each day's physical activity is the best way to see trends in your fitness and spot shortcomings that need work.

For instance, if you suffer on climbs during weekend group rides but your training diary shows that you rarely ride hills during the week, it's pretty obvious that you're not climbing often enough to improve.

Get physiological testing. I discuss testing in the next chapter. It's the easiest way to discover your physical abilities (and liabilities). Testing the physiological parameters that impact endurance can tell you a lot about your genetic ceiling—how good you can become if your training is optimum.

Get a coach. A coach is crucial to performance improvement. He or she can set up a solid program, keep you from overtraining, and monitor your results. But a coach's most important function is to identify your limiters and figure out how to remedy them.

EXAMPLE! A masters rider I know was self-coached for his whole career. He prided himself on objectively monitoring his fitness and his skills, devising training plans that addressed his weaknesses. He often won races. But one season he began to falter. He could stick with the lead group to the finish but couldn't sprint fast enough. So he worked on his sprint exhaustively—and still didn't improve.

Finally, in desperation, he hired a coach. After some analysis, the coach determined that this rider's sprint was fine when he wasn't tired. His problem was that accumulated fatigue from the early stages of the race was blunting his sprint at the end. He shouldn't have been working on speed—he had plenty of speed—he needed to work on endurance at race intensities. Then he could get to the finish with some freshness still in his legs.

Training vs. Ride-Like-You-Feel

Once you've determined your limiters, the next step is to develop a plan to remedy them. The rest of this eBook will tell you how to get better during the off-season, no matter what kind of limiters you've identified. I'll also suggest specific training to help you address your weaknesses.

But some riders don't like structured training plans. If they're given a schedule that tells them to do intervals on Tuesday, they protest that while those intervals may be the appropriate training routine for that day in theory, in practice the world gets in their way. It's raining, or the boss wants them to stay late, or the windows need caulking, or their child is sick.

Riders solve this problem by riding like they feel.

If Tuesday comes and they feel like hammering, they do intervals or hit hills hard. On the other hand, if they aren't recovered from the weekend or suspect that they're coming down with a cold, they may take an easy 45-minute spin instead. When the responsibilities of life intervene and they're forced to miss a Tuesday ride, they shrug it off and tend to the other things.

Because life happens, training plans that are set in stone are doomed to failure.

“You must plan to meet a goal,” says training guru Tudor Bompa, “but the plan doesn't need to be rigidly applied. The plan must be flexible.”

In [chapter 11](#), I suggest 18-week training plans for three broad categories of riders—but they're only suggestions. The final decision on what you do each day is up to you.

It's this individual fine-tuning of workouts that makes physical improvement such a fascinating game.

Chapter 3

Physiological Testing

No training program is truly useful unless you can monitor your results. Why train hard all winter without a means of tracking improvement—or identifying stalled progress?

In the weight room, it's easy to see if you're getting stronger. Simply record pounds and repetitions for each exercise. On the bike (or trainer) it's more difficult to precisely chart improvement. In this chapter, we'll look at several valuable testing procedures that you can perform.

Why Test?

Because the bottom line for any off-season program is improved riding ability, it's absolutely vital to generate quantifiable information. That's the only way to know when to change your program and when to stay the course.

According to Chris Carmichael, "Evaluation is important so you can see if you're improving. A good test has to be easy to administer, not invasive, and quick so you don't lose training time."

What Kind of Tests?

There are two types of on-bike tests.

The first starts at low resistance and takes you to maximum effort. The resistance is cranked up at set intervals (usually three minutes) until you simply can't continue to turn the pedals at a reasonable cadence.

Sometimes only wattage and heart rate in each three-minute segment are recorded. If you go to a sports medicine facility, you'll also usually get an EKG and figures for maximum oxygen consumption (VO_2 max), lactate levels and blood pressure.

CAUTION! Maximal tests are exhausting so should be administered only once or twice a year. Tests that require extreme effort shouldn't be taken without a physician's permission.

The other test requires only a sub-max effort, usually around 90 percent of your heart rate potential. Because a sub-max test isn't so strenuous, it can be done more frequently and even as part of regular training.

Usually, coaches suggest that you undergo a diagnostic test every four to six weeks. It takes at least a month for any training program to generate results, so more frequent testing isn't useful.

Dr. Max Testa suggests this pattern: “In a four-week training cycle, test for improvement in the last part of the fourth week, the week you decrease your volume and intensity of training. The test should be like a race. Get psyched up and mentally involved to do your best.”

Chris Carmichael, on the other hand, likes his riders to be tested every six weeks. You can use the schedule that works best for your program.

TIP! Test only when you’re rested, well hydrated and ready for a strong effort. Treat the test like a race. Get psyched, round up some friends to cheer you on, and give it your total effort.

Performance Testing in a Lab

Once a season, usually in the middle of summer, it’s useful to go to a sports medicine facility for a test that measures your VO_2 max, heart rate at lactate threshold (LT) and wattage at LT. These things are good to know so you can chart your progress from year to year.

CAUTION! It’s tempting to compare your results to other riders in your age category. Don’t do it! Use performance testing only as a way to chart your own improvement.

EXAMPLE! VO_2 max (a measure of how much oxygen your muscles can use) is often considered the best indicator of endurance potential. A relatively low number has ended the careers of promising riders. Even though they were performing well on the bike, they thought that their test meant they’d never reach higher levels in the sport. Because VO_2 max is highly heritable and hard to improve significantly, they simply gave up. Now we know that VO_2 max is a relatively poor indicator of actual performance on the bike.

Far more important than VO_2 max are two other parameters easily measured with a lab test.

1. The percentage of maximum heart rate that you can sustain at your lactate threshold. (LT is the highest heart rate you can ride at before the nasty effects of lactic acid accumulation in your muscles make you slow down.) Most top endurance athletes can maintain a heart rate of 90 to 92 percent of their max for 30 to 60 minutes. This ability can be trained and improved significantly.

2. The amount of power (watts) you generate at your LT heart rate. This, too, can be improved with progressive workouts.

Lab Test Protocol

I’ve taken a number of tests at facilities around the country. The protocol can differ slightly, but typical is the procedure used at the renowned Boulder Center for Sports Medicine in Boulder, Colorado, directed by Andy Pruitt. (www.bch.org/sportsmedicine)

Testing takes place on a laboratory bike (ergometer) integrated with a computer. The ergometer should be set up with a racing-style saddle and a drop handlebar so you can duplicate your position on your own bike. This is crucial to getting accurate results, so insist on it. An unfamiliar position means you won't be working at optimum level. Incorrect saddle height can injure knees even in a short-duration test because you turn the pedals with so much force.

In some facilities you can be tested on your own bike. It's mounted on a trainer with wattage and speed read-outs. But it's simpler to use an ergometer as long as it's easily adjustable for position. Another plus: You won't sweat all over your good bike—and you will be sweating!

When testing at the BCSM, riders bring their pedals, shoes and shorts so they feel at home on the ergometer. When you sign up for a test, the BCSM sends instructions on how to prepare—taper workouts the week before, and don't eat during the three hours preceding the test. It's important to have an empty stomach because the test requires all-out effort. It's okay to sweat all over the ergometer but not decorate it with your breakfast.

Before starting, the lab technician attaches electrodes to your chest to monitor heart rate and EKG. They're held in place with a stretchy piece of gauze shaped like a sock that you pull over your upper body. It's tight and uncomfortable but you get used to it.

The technician also checks your blood pressure periodically throughout the procedure. Testing is stopped if it rises excessively.

The most unpleasant part for most cyclists is the plastic mask you have to breathe through. It's designed to collect and analyze expired air. The mask goes over your nose and mouth. It's uncomfortable and a little claustrophobic for some people, at least at first. Don't worry—soon you'll be working so hard you won't even think about it.

The test starts with an easy warm up. Then pedaling resistance is increased 20 watts every three minutes. Heart rate is monitored continuously. At the end of each three minutes, the technician draws blood from a fingertip. It's relatively painless compared to the effort you must make.

Each blood sample is analyzed to see how much lactate it contains. When the amount rises abruptly, you've reached your lactate threshold. Your heart rate and wattage output are recorded right then.

After you reach LT, the technician decreases the resistance and lets you pedal easily until you recover. So far, so good. But now comes the hard part.

To measure VO_2 max, the resistance is repeatedly and rapidly cranked up (usually every minute) until you can't pedal at a reasonably high rpm no matter how hard you try. It feels like racing up a steep hill in the big chainring. The computer automatically analyzes the gases you're breathing in and out to determine your maximal oxygen uptake.

Man, that's hard! You're given time to pedal slowly and recover before you head to the shower.

After the test, a physiologist sits down with you to go over the computer-generated charts and graphs that define your performance. He makes recommendations about training zones and workout plans to help you improve.

This data also helps your coach set up a year-long training program with appropriate intensity levels in each season. The key, as always, is to work hard enough to reach your potential but also avoid overtraining.

OTC Test Protocol

If you have an indoor trainer with watt-measuring capability (such as a CompuTrainer), it's easy to duplicate the protocol used at a sports medicine facility. It's done this way at the Olympic Training Center (OTC) in Colorado Springs.

CAUTION! Don't administer any performance test to yourself without a physician's approval. These tests require you to reach maximum exertion. If you have an undetected heart condition, they could be fatal. Always have someone on hand to help in an emergency.

After you have medical clearance, the test is done by pedaling for as long as you can maintain a cadence of 90 rpm while resistance is increased every three minutes.

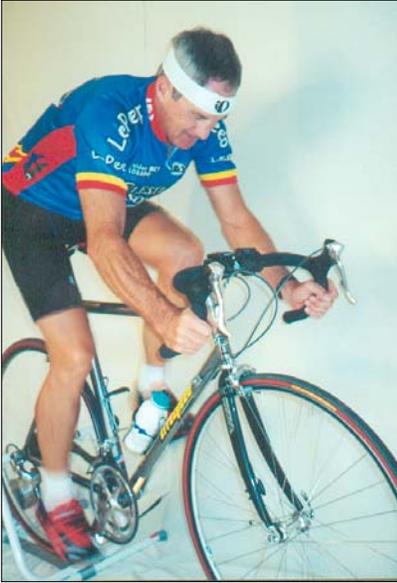
In the OTC protocol, the workloads are equal to progressively greater percentages of the power required to maintain a speed of 35 kilometers per hour (21.6 mph) up a one-percent grade. The percentages are set at 30, 50, 70, 90, 110 and 130.

The actual wattages are height- and weight-based. For example, a 70-kg (154-pound) rider between 69 and 72 inches tall would ride for three-minute periods at workloads of 113, 188, 264, 339, 416, 490 and 566 watts. The figures are usually rounded off because most devices can't be set with such precision. So, a common sequence would be 110, 190, 260, 340, 420, 490 and 560 watts.

For any but young, elite riders destined to spend July in France, this test gets very hard, very quickly. Many strong masters-age recreational riders can manage to get through three minutes at 260 watts but can't last for another three minutes at 340 watts. If they get to 420 watts, they blow up quickly. Those last two jumps are huge!

TIP! If you want to take this test and you're not an elite rider in your 20s, it's better to uniformly reduce the wattage by 10 or 20 percent. The test will last a bit longer and give you a more useful picture of your fitness.

Home Max-Test Protocol



If you have a CompuTrainer or other watt-measuring device, you may find the following simple testing protocol easier to self-administer than the OTC method just described.

1. Wear a heart monitor and ask a friend to record your heart rate at the end of each three-minute “ramp” in the test.
2. Warm up with 15 minutes of easy pedaling at a low wattage. Build from 80 watts to approximately 120. When you’re breathing steadily and have broken a light sweat, pedal easily for five more minutes.
3. Begin the test by pedaling at 90 rpm and 100 watts for three minutes. Record your heart rate at the end of this ramp.
4. Increase resistance by 30 watts (to 130) and pedal for another three minutes. Keep a 90-rpm cadence. Again, record heart rate at the end of the ramp.
5. Increase resistance by 30 watts three more times (160, 190, 220 watts) and ride for 3 minutes at each setting. Make subsequent increases 20 watts, again riding at each successive setting for three minutes. Continue recording heart rate at the end of each three-minute ramp.
6. The test is over when you can’t maintain 90 rpm no matter how hard you try. Record your final heart rate and how long you lasted in the concluding three-minute segment.

This test is extremely demanding, but it’s worth the effort because it tells you how much power you can maintain at a given heart rate. Because it is an all-out test, it should be done only twice a year. Schedule the first test in early January to give you baseline numbers. Re-test in the middle of the season to get results when you’re at peak fitness.

TIP! Always taper training for several days before testing to make sure you’re fresh and results are comparable.

Home Sub-Max Test Protocol

Every four-to-six weeks, schedule a simpler, less exhaustive test. Simply repeat the Home Test Protocol but don't pedal to exhaustion. Stop the test when you reach your lactate threshold heart rate.

TIP! Your lactate threshold heart rate is the heart rate you can maintain for a 30-minute time trial. In a well-trained cyclist, it's usually about 90 percent of maximum heart rate. So, if your max heart rate (as revealed in the all-out effort of the primary test) is 185 bpm, your LT heart rate should be near 165.

Obviously, it's much less stressful, both physically and mentally, to raise your heart rate to 165 than to 185. That's why it's no problem to take this second version of the test more frequently.

With the data from these tests, you'll learn how much wattage you can push at a given heart rate. After training effectively for six weeks, you should be able to ride a given three-minute test segment at a lower heart rate than you achieved in the previous test.

What? No Watts?

What if you don't have a CompuTrainer or other method of determining wattage?

Simply use your basic indoor trainer. You don't need a specific wattage number, just a consistent resistance from one test to the next.

Use the same bike, the same tires and the same trainer each time you test. Inflate the tires to the same pressure (100 psi is good). Turn the crank that tightens the roller against the rear tire an identical number of turns each time.

Start in an easy gear (say 39x19-tooth) and shift to a harder gear at the end of each three-minute segment. Use the same size cassette so you have the same gear progression each time you test. Ideally, cogs will have a consistent difference of one or two teeth so that there are consistent jumps in effort from one three-minute ramp to the next.

Stop the test when your heart rate reaches LT. Record the gear and how long you lasted before reaching LT in the final three-minute segment.

You can also do this test outside on a flat road by shifting through the gears every three minutes. But wind, traffic and other variables make it tough to get consistent results.

TIP! Always remember, you're not competing against anyone when you test. Instead, you're comparing your fitness this month with next month or next year so you can chart your improvement.

There's no standard protocol you must use. The only requirement is to use the same protocol each time you test. Then you can accurately compare yourself to yourself.

Chapter 4

Whipping Winter Weather

Unless you live in temperate climates where winter means slipping on a sweater in the cool of the evening, you probably equate off-season training with cold weather. Sure, you can retreat to the indoor trainer and weight room to escape the arctic blasts. But what fun is that?

Cycling is an outdoor sport. Even at its January worst, cold weather shouldn't limit your riding (or cross-training). As the Scandinavians say, the weather isn't too cold, you're just under-dressed!

What about your precious bike, subject to the perils of gritty slush and road salt? I have a solution for that problem, too.

If you know how to handle winter, both with clothing and equipment, you can ride into spring with all the fitness you need to begin a great season.

Here's how to beat the Big Chill.

It's a Cold Wind Blowin'

Before you venture outside in frigid conditions, it's important to know about windchill. Wind decreases effective temperatures enormously. For instance, at a relatively balmy 40F degrees, a 25-mph headwind means that the cold you feel is equivalent to only 16 degrees.

CAUTION! Remember that even on a dead calm day, riding a bike creates its own headwind. If you're riding at 15 mph, it's equivalent to standing still and being buffeted by a 15-mph wind with its accompanying chilling effect. If you're riding 15-mph into a 10-mph headwind, it's the same as the wind blowing at 25 mph. This has a huge impact on how cold you feel—and how you should dress.

TIP! To lessen the effect of windchill, plan winter routes so you travel into the wind on the outward leg. You'll get the coldest part of the ride done early before your clothes become moist with sweat. When you're damp and getting tired, the frigid blasts will be at your back, blowing you home.

Windchill below about 10 degrees can make cycling dangerous. It's hard to stay sufficiently warm to ride long enough for worthwhile training, though an hour of pedaling in winter's crisp air and sunshine certainly has other benefits.

The faster you go, the greater the windchill. So, it makes sense to reduce your ground speed while still keeping resistance high enough for a good workout.

One way is to ride a mountain bike on the road. You'll go slower, but the fat tires and wind resistance of a more upright position guarantees productive pedaling resistance. As a bonus, you'll spare your good road bike a soaking in the slush and salt.

Another benefit of knobby tires: They provide much better traction in any snow you might ride across.

Layers and Layers

You've probably heard about layering your clothes in cold weather. The idea is to trap body heat in several lightweight garments, which also sequentially wick sweat away from your skin to keep it drier. For cycling, this works much better than wearing a heavy, bulky jacket over a sweatshirt.

On your upper body, start with a thin base layer. Most of these are made of a synthetic material. Although synthetics smell like a hibernating bear after one wearing, they do a great job of wicking moisture from your skin. If they get damp—from sweating on a climb, for instance—they feel dry again quickly.

Some riders like wool base layers because wool has great insulating properties without accumulating the objectionable odor. Wool garments are harder to find, though. Rivendell Bicycles (www.rivendellbicycles.com) is one source I've used. Rivendell offers several styles of wool base layers that don't itch or shrink.

TIP! Turtlenecks are nearly essential for winter cycling because it's so easy to lose heat from your unprotected neck. An icy wind on your throat or the back of your neck can make you feel cold no matter what you're wearing. If the high top irritates your skin, lube the affected areas with petroleum jelly or a skin cream.

Over the base layer, add a short sleeve jersey for moderate temperatures or a long sleeve jersey or light fleece vest if it's below freezing. On top, wear a lightweight windbreaker (often called a "shell"). It should block the wind but have underarm or back vents that allow some airflow. It should also have a full-length zipper for ventilation.

If it's significantly below freezing, wear a second base layer or jersey. In arctic conditions, use a winter cycling jacket. It should have windproof panels on the chest, shoulders and front of the arms. The material on the back should breathe to let excess heat escape. Again, there should be a full-length zipper.

CAUTION! Never wear a cotton garment next to your skin. Cotton doesn't wick sweat. Instead, it gets soaked, then feels clammy and cold. It's one fiber that doesn't belong in a cyclist's winter wardrobe.

Legs

Legs are easier to keep warm than your trunk or extremities. Most riders are comfortable in leg warmers down to about 45F degrees. Lightweight tights work from there to about freezing. Wear heavier winter-specific tights with windproof front panels, especially on the knees, when the temperature is in the 20s or colder.

CAUTION! Don't make the mistake of wearing too little on your legs even if they feel okay. You risk knee injuries if they aren't appropriately covered. Also, your body will shunt blood from your feet to your under-protected legs, leading to a serious case of frozen tootsies.

CAUTION! Men—beware of penile frostbite. A cold wind can penetrate your tights and cycling shorts, freezing tissue that's near and dear to you. Wind-front tights help. Tuck your base layers down around everything. You can also insert an old polypro glove, sock or piece of fabric down the front of your shorts.

Head

Lots of warmth can be lost through the head because the scalp is networked with blood vessels. A thin polypro skullcap under your helmet is usually enough to prevent excessive heat loss. Ears are a different story. They can become uncomfortably cold even in air that's above freezing. A fleece-lined ear band will keep them warm without making the rest of your head too hot. Excess heat will still escape from the crown of your head.

When it's colder, wear a thin balaclava under your helmet (photo). This covers everything but your face and can be pulled up under your mouth or nose. Tuck it into your turtleneck or a neck gaiter to prevent air leaks. If the balaclava is properly thin, it won't make you too hot or even require you to change the size of your helmet pads.

Speaking of helmets, it takes very cold conditions before you need to cover the vents. Otherwise, let the airflow keep your head from becoming too hot. If your head starts sweating, you'll start sweating all over.



Feet

There's an old saw in cycling that says: You can only be as warm as your hands and feet. When your extremities get cold, your core is next. When your core gets cold, your hands and feet can freeze because minimal blood goes there. Your body fights to keep vital organs warm by reducing blood flow from your torso.

So, let's keep your feet toasty first, then warm up your hands.

Cold feet are probably the biggest complaint of winter cyclists, and for good reason. Few things are more painful than feet thawing after a frigid ride. But it's not hard to keep your toes toasty even in subfreezing temps, at least for rides of 90 minutes or less.

Shoe covers ("booties") are the key. They come in two types: neoprene rubber, or fabric with a fleece lining.

Neoprene is heavier, bulkier and stiffer than fabric, but it costs less. It does a good job of blocking wind, but it's only fair against water. It holds in body heat pretty well. In fact, too well in one respect. Neoprene can cause condensation that dampens your shoes and socks. Dampness and cold are never a good combination.

Fabric booties are light and floppy. Most models can be rolled up and stuffed in a jersey pocket or seat bag. Wind resistance is good, and so is water resistance, depending on the outer material. Fleece lining helps insulate and is less likely than neoprene to cause condensation.

It's hard to overheat feet, so wear booties even on days that are merely chilly. Remember, when your feet are warm, you've got a much better chance of feeling comfortable all over.

When shopping, choose booties that extend high up your ankle and have a snug top. You want plenty of overlap with your tights to keep feet heat in, not vented like a chimney. Make sure there are reflective stripes. It's smart to wear things that can catch a driver's eye. In the low light of a dank winter day, bobbing booties that shine in headlights make you safer.

If you ride in cleated shoes, you may need to cut a hole in each bootie's sole. Make it just large enough to expose the cleat. Any more will let in cold air.

TIP! For frigid temperatures, or if you want to stay out for more than 90 minutes around freezing, you need extra foot insulation. Consider buying cycling shoes one size larger so you can wear thick wool or wool/synthetic socks. Don't try to cram thick socks into your regular summer shoes. The tightness will restrict circulation, making your feet feel colder than if you wore thinner socks.

Hands

If it's cold in the morning but will warm during the ride, wear regular short-finger cycling gloves under lightweight long-finger gloves. These gloves should be made of a stretchy woven fabric with a gripper material on the palm so your hands won't slip on the handlebar. They'll keep your hands comfortable on the cold metal brake levers. Simply strip them off and stuff them in your jersey pocket when it gets warm.



Lightly insulated gloves work fine to the mid 30s. Below freezing, go for so-called “lobster” mitts (photo). These put your fingers in three compartments—one for your thumb and one each for your first two and last two fingers. This pools finger heat for more warmth, but unlike with full mittens you still have the dexterity to operate a bike.

Winter gloves should have a tall, stretchy, snug-fitting cuff for plenty of overlap with your long sleeves. An air leak at your wrist will make your hands feel cold no matter how well insulated the gloves are.

In a cold rain, good luck. Shell gloves may keep your insulated gloves drier, but hands are susceptible to getting wet and chilled because they're so exposed as you ride. Your best bet may be insulated lobster mitts, which still work fairly well when wet. Neoprene gloves are supposedly designed for the rain but

still get wet inside, and the models I've seen lack insulation.

CAUTION! Don't overdress your hands. Unlike with your other extremities, feet, there's such a thing as too warm. If your hands begin to sweat and gloves get damp inside, your fingers can become uncomfortably cold real quick. It's better to err on the side of cool but dry.

Hypothermia Is No Hype

Hypothermia is an insidious killer of the unprepared. It's often associated with raging blizzards and treks to the North Pole. But hypothermia is more likely to strike in relatively mild weather when an unprepared cyclist or backcountry traveler gets stuck in an unexpected cold rain or wet snowfall. The body's core temperature gradually falls to a level that can be fatal.

Symptoms progress from mild to uncontrollable shivering as the body tries to warm itself. Victims become fatigued, lose their sense of time and distance, and gradually become so confused that they make irrational choices like abandoning gloves or parkas. When shivering stops, a sense of profound apathy takes over and many victims die, unable to find their way to safety or perform simple survival tasks like starting a fire.

Avoid hypothermia by dressing in layers. Always wear moisture-wicking clothing instead of cotton. Be aware of weather patterns in your area and dress or pack your bike bag accordingly.

If you're getting cold and begin shivering, especially if you're wet, seek shelter immediately. Because victims are often unaware of hypothermia's onset, watch for symptoms in your companions. Find a convenience store and buy something hot to drink. Eat enough to produce some body heat. Don't set out again until you've added enough clothing to stay warm.

EXAMPLE! The closest I've come to hypothermia on a bike didn't take place on a frigid Colorado ride. Instead, it was in Arizona in March, on the final day of Lon Haldeman's PAC Tour spring training camp. I was riding the 90 miles from Sierra Vista to Tucson and got caught in a wind-whipped 38-degree monsoon.

With me were two friends, Ed Pavelka and Pete Penseyres. It was raining so hard that we couldn't see the pavement clearly, and we were worried that overtaking vehicles couldn't see us. Every time one passed, it kicked up a tsunami of spray that concealed us from other traffic. It was like riding in a waterfall. I was wearing tights, shoe covers, two layers of fleece, a balaclava, winter gloves and a shell zipped up tight. I was soaked and freezing.

Then Pete flatted. We huddled by the side of the road, three of us trying to force a wet tube into a sodden tire with fingers too numb to feel. Picture the Keystone Cops changing a flat. Our skin was literally turning blue. Without pedaling to generate body heat we immediately started shivering. When we finally got the flat fixed, we tore off down the road at time trial speed, riding as hard as we could to warm up.

It didn't help much because the chill was core deep. Another flat would have meant true disaster. Eventually, we came to the camp support van. Piling inside, we sat shivering and dripping and eating till the heater worked its magic. The rain let up. We put on dry base layers and continued to Tucson with an epic-ride memory that has yet to fade.

Slick Roads

Running or cycling in cold weather can be dicey if you come upon an icy spot unexpectedly. The most dangerous condition occurs after the sun melts snow slightly. A thin layer of water spreads over the pavement, then freezes in late afternoon, creating a barely visible film of incredibly slippery "black ice." When the roads are mined with such skating rinks, it's far safer to choose an indoor fitness activity.

Even on a warmer day, you need to be careful anytime you ride through a shadow, especially in a turn. Without direct sunlight, icy patches often won't melt. To make it worse, they're hard to see when your eyes are trying to adjust from bright light.

If you brave slick roads—or the surface begins icing over because of falling temps—ride gingerly. In corners, slow way down, take a wide line and don't make abrupt movements. If you're losing traction in turns, use a mountain bike downhiller's trick by unclipping your inside foot so you can use your leg like an outrigger (photo).

Remember, it's no disgrace to phone home or hitch a ride when the road becomes dangerous. It's preferable to hitting the deck and breaking something. Drivers may not be fully in control of their vehicles, either, making it risky for them to maneuver around a cyclist.



Tip! Snowy, icy roads are best tackled on a mountain bike with studded tires or chains. The upright riding position is better for control. Studs or chains grip like a limpet, even in skating rink conditions.

Early Darkness

Even if winters are not icy where you live, it still gets dark early after the autumnal equinox. Just about the time you get off work, aching for a ride, the sun goes down. And Old Sol sinks with a thud in winter—there's no extended twilight to give you a safety margin if a ride runs long.

The solution is a good lighting system. Bike shops and cycling catalogs are full of models in a wide price range.

For short jaunts on lighted roadways, opt for a simple headlight that operates on replaceable batteries. You don't need to pay more than \$25. Because there's ambient light to see by, the headlight's main purpose is to make sure that drivers spot you. Combine the headlight with a rear flasher and plenty of reflective tape and material on your frame and clothing.

If you plan to ride much on dark roads, consider a high-end lighting system with a rechargeable battery. I'm partial to models that have both a low and high beam. This extends the battery charge because you can use the low beam much of the time. But when you're going fast enough to outrun it, the high beam provides extra illumination.

TIP! Don't be too frugal when buying a lighting system. After all, your riding enjoyment and safety is at stake. Pay enough for dual beams, weatherproofness, and a NiCad or NiMH rechargeable battery. The latter, nickel metal hydride, is lighter and requires minimal care for long life. Steer clear of lights that use sealed lead acid (SLA) batteries. They may be cheaper, but they're also heavy and short-lived if the light is kept on after it dims. NiCad and NiMH batteries thrive on deep discharges.

The Beater Bike

If you ride in the off-season, you'll be riding in sloppy weather. Rain and melting snow can make a mess of streets and highways. On rural roads, mud tracked onto the pavement by farm equipment turns idyllic country lanes into something resembling muddy singletrack.

Ride your good bike in these conditions? Forget it. The thought of risking your favorite mount on roads that look like the trenches of World War 1 is guaranteed to send you scurrying back to the comfort of the couch.

The solution? A bike for all seasons, a “beater” that laughs at the worst that winter has to offer. This is a bike that you can ride in the worst conditions imaginable, then simply hose off once the grime gets so bad that you can't remember the frame's color.

Now I'll tell you something that you may not believe: You're going to love this bike!

It might be old, it might be dirty, it might be fitted with a mismatch of cheap and discarded parts, but it's the reason you can ride in winter. Almost no weather can stop it. In fact, it's the bike that will get you out on wet days in the spring, too. Bad-weather rides tend to be memorable, so it won't be long before you look at your beater fondly, remembering the challenging—even epic—rides that it made possible.

If you don't already have an old bike that you can turn into your beater, look for one in bike shops, yard sales, or classified ads. Check bulletin boards and bike club newsletters. Ask other riders what's gathering dust in their garages. Sure, you can buy a new bike built for touring or cyclocross and outfit it for winter. But it makes sense to economize and buy something that's already scratched and dented. It won't break your heart the first time it gets filthy.

EXAMPLE! When writing this chapter I did a little research at my local shop, Cascade Bicycles in Montrose, CO. I wanted to see if they had any used bikes in stock that might make good winter steeds. (Hey, any excuse to hang out at the shop!)

Cascade owner Alan Ardizone had just acquired an old Motobecane Grand Jubilee in good condition. It was equipped with 1970s-era components that seem like museum pieces now but are perfect for winter training because they're simple and reliable: Weinmann centerpull brakes, SunTour Cyclone derailleurs with Power Ratchet down-tube shifters, plenty of clearance for wide tires and fenders, and eyelets on the rear dropouts and fork for attaching rack or fender struts. That's the kind of bike to look for when you're beater hunting.

Of course, there's one critical requirement when picking a bike: It must allow you to have the same riding position as on your good bike, following simple tweaks to the saddle and stem/handlebar locations. If you train all winter in one position, then jump on your summer scoot that's set up differently, you're asking for trouble.

Here are two off-season exceptions to that rule:

1. If you wear thick tights over your cycling shorts, you should lower the saddle a couple of millimeters to compensate. The added material between your crotch and the saddle has the effect of reducing your leg length. In effect, it makes the saddle higher than on your summer bike.
2. Raise the handlebar slightly in relation to the saddle if you regularly ride in lots of clothing. Layers around your midsection may make it harder to bend over in your regular riding posture. A higher bar also helps bike handling in slick conditions.

Mechanical Matters

To keep a beater running well, recycle old components. Toss them in a box when they come off your summer bike during upgrades. Then when your beater needs a part (or a part of a part), you can get several thousand more miles out of things that you might have thrown out.

EXAMPLE! My partner at RoadBikeRider.com, Ed Pavelka, pretzeled his front wheel on a cross-country tour when he rode into the biggest man in Jessup, GA. The guy suddenly stepped into the street from between parked cars. The crash even cracked Ed's helmet.

Tour director Lon Haldeman stomped on the wheel to remove the biggest bends, then finished the job with some rough-and-ready truing. Amazingly, it held up for the last two days of the tour. After getting home, Ed decided to put the wheel on his Bridgestone RB-2 beater bike to milk a few more miles from it. Now, 10 years and some 45,000 miles later, it's still on the bike.

The rest of Ed's beater is a collection of parts saved from the scrap heap, too. Other than the frame, seatpost, down-tube shifters and brake calipers, nothing is stock. Look closely under the grime and you'll see an old Dura-Ace crankset and derailleurs—still working reliably even though they were once “too worn out” to keep on his Litespeed.

My beater (photo) just happens to be a Bridgestone, too—an XO-1 retrofitted with road bars. In eight years of winter training and summer dirt road abuse, it has gone through a number of different derailleurs and drivetrains. Now it has bar-end friction shifters mated to an old mountain bike cassette, components I scrounged from my spare-parts box in the garage.

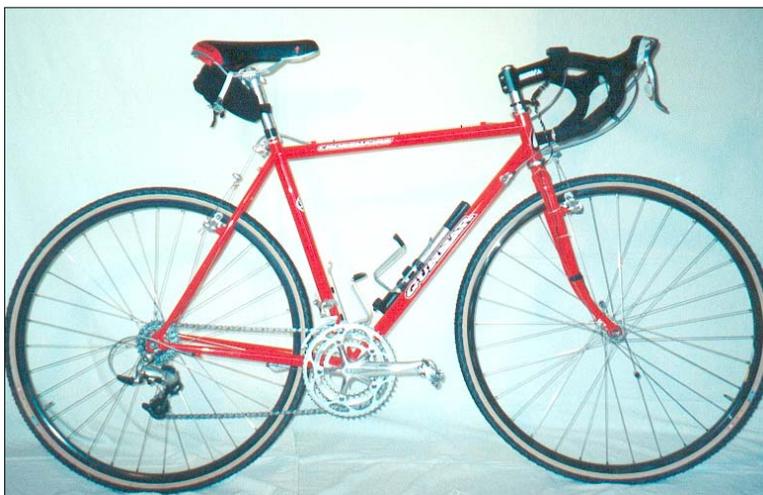
It looks like something ridden by a 1950s English tourist—as his second



bike. Would Ed and I use such archaic equipment for important events or racing? Of course not. But for winter training, these old Bridgestones (a Japanese brand no longer available) are perfect.

TIP! Don't worry about your beater's weight. Ed's RB-2, fully outfitted for winter riding, is 33 pounds. My XO-1, with fenders and a seat bag containing two spare tubes and a mini-tool, comes in at 30 pounds. It's a tank. But when I'm riding it on flat or rolling courses, I don't notice the weight at all. Of course, on long climbs I'm slower on this bike than on my sub-20-pound Litespeed. But in winter it doesn't matter because I'm not trying to drop anyone. And if I'm the one who gets dropped, well, I know the way home.

I believe that a heftier winter bike is actually a training advantage. Come spring, a regular bike feels like a feather. Pedaling those extra pounds all winter can even be viewed as a form of weight training.



I also have a second winter bike (photo), a Gunnar Crosshairs with cantilever brakes, a triple crankset and clearance for fenders and wide tires. I bought this one for double duty and ride it year round.

I use it for winter training on paved roads and, equipped with cyclocross tires, it's a great bike for riding loops that start out paved, deteriorate to gravel and finally end up as dirt jeep roads or mild singletrack. With the triple, it's geared low enough to handle

any paved road in my area including the fearsome ascent of the East Portal, a three-mile climb in Black Canyon National Park that averages 16 percent.

One thing a true beater must have is fenders. You gotta have fenders in winter. Without them, water, mud and grit kicked up by the front wheel coats the bike and soaks your feet and legs. A rooster tail of grunge wets your fanny and stripes your back. Road crud enters the headset and trickles inside the bike's frame tubes via the seatpost.

Install fenders, however, and most of that grime and water is caught and directed back to the road where it belongs. Your body stays much drier (if it isn't actually raining) and your bike stays cleaner. You won't have to wash and lube it as often.

Fenders also protect your riding companions from wheel spray. In wet climates like England, Ireland and the U.S. northwest, you aren't welcome on group rides without fenders. No one wants to suck gritty, tire-flavored water flying up from your rear wheel.

The best fenders are plastic and have mud flaps. The one in front is vital for keeping water off your feet. If your fenders don't have mud flaps, fabricate them from a large plastic detergent

bottle. Make them about six inches long and several inches wider than the fender itself. Drill through and attach with small bolts. Be sure to use lock washers.

TIP! Fenders may fit better and stop rattling if you use a tip from Grant Petersen at Rivendell Bicycles (www.rivendellbicycles.com). He recommends attaching them with zip-ties rather than the metal or plastic brackets they come with. Simply drill small holes in the fenders so you can zip-tie the front one to the bottom of the fork crown and the rear one to the chainstay bridge and rear brake bridge.

No dropout eyelets on your frame for attaching fender struts? No problem! Simply zip-tie the struts to the fork or the rear dropouts. Wrap electrical tape first so no metal contact mars the finish.

Three final bike tips:

- **Use wide tires.** Winter is no time for skinny rubber. Thicker tires give you more protection against punctures and better traction. For even more flat resistance, use tires with a Kevlar belt under the tread. Remember, when you have to stop to fix a flat, you may catch a chill that you can't shake for the rest of the ride.
- **Use strong wheels.** Your beater bike is a great place to install those heavy-but-tough 36-spoke wheels that are now outmoded for performance riding. A well-built wheel should last for years of winter riding. My Bridgestone XO-1 is still rolling on its original wheels after seven years of hard use. I've replaced a couple of spokes and re-trued occasionally, but even after miles on dirt roads and some singletrack, they're going strong.
- **Use reflectors.** Decorate your beater like a sixth grader with bad taste. Even if you don't plan to ride after dark, the sun may set on you occasionally. In winter, a puncture or wrong turn can turn a late-afternoon ride into a night ride real quickly. With reflectors and reflective tape on your frame, wheels and crankarms, you'll still show up in car headlights.

For the same reason, it's smart to have a high-intensity, battery-powered taillight on your seatpost. You can reach down and click it on anytime you worry that dim daylight is making you less visible to drivers.

Part Two

Off-Season Training Tools

Chapter 5

Reaching Ideal Weight

If enthusiastic cyclists have one predominant obsession, it's the endless quest to lighten up. We shave needless weight on the bike by scouring catalogs in search of gram-saving components. But that fixation is minor compared to our dreams of looking as light as Lance Armstrong did every July.

We all covet the lean, wiry body of an elite-level cyclist. Most of us, stuck with a pickup truck chassis, still want to look like our heroes.

The off-season is the ideal time to shuck extra pounds, as we'll see. But before you pass on dessert for the rest of the winter, let's look at the facts about body type and weight loss.

Is Heredity Destiny?

Elite road riders are almost uniformly thin. Body fat percentages for top male cyclists average four to ten percent. Elite women, because of their sex's childbearing demands, range about five percentage points higher.

In addition to low body fat, these athletes are typically quite small. The average Tour de France competitor (male) is about 5-foot-9 and 150 pounds. However, because the bike equalizes physical differences, elite cyclists vary in size more than elite runners. The biggest rider in the 2001 Tour was 6-foot-5 and 190 pounds. Put him on a weight program and you've got an NFL linebacker. In contrast, the shortest rider was 5-foot-4, and the lightest was 116 pounds—jockey material. But big or small, none of these top-rated cyclists pack much fat.

So, it's easy to look (and ride) like our cycling role models, right? Simply shed that excess *avoirdufois*.

Now here's your dose of reality: You can train at pro levels and restrict your diet to anorexic levels in an attempt to get that greyhound look. It ain't gonna happen.

The Truth About Body Types

While a sensible training regimen, coupled with a moderate and nutritious diet, will in most cases cause *body fat percent* to decline, it won't change your *body type* significantly.

Let's see why great endurance athletes are so thin—and how you can improve the body you have even though you can't become a waif regardless of your training and nutrition.

Elite cyclists chose their parents carefully. Young athletes naturally gravitate to sports where they're successful. Muscular, fast people become football players. Those gifted with outstanding vertical jumps and eye-hand coordination become basketball players. In the same way, small, wiry athletes with great endurance capacity tend to become runners or cyclists.

The sport doesn't mold the body in its image. Rather, the athlete chooses (often unconsciously) the sport for which he or she is most suited.

It's a form of natural selection, not training. It decrees that elite cyclists are small and offensive tackles large. If your parents started you off in life with a shot-putter's body, no type of training will miraculously convert you to a string bean.

Elite cyclists are trees, not V's. I owe that one to Eddie Borysewicz, the legendary cycling coach. Eddie B means that top riders generally have a similar circumference from their hips to their shoulders, not the V-shape upper body we generally consider the athletic ideal.

Top cyclists carry only appropriate muscle. Their legs are strong but still lean. Their upper bodies, which do little to propel a bike, are extremely light. If you naturally have substantial muscle in your upper body, training only the legs through cycling will cause arm and torso muscles to get smaller, but only proportionately.

Cycling depends on body mass. To be a successful road racer, you need to climb well. It's on hills that the selection in many races takes place. And because light cyclists generally have a better power-to-weight ratio than heavier ones, they are almost always better climbers. The old adage, "You can't race if you can't climb," is demonstrated in local events as well as the Tour de France.

Ideal endurance athletes have the least amount of body fat they can tolerate and still retain general health. Even so, some relatively hefty people are quite talented cyclists. The pro ranks contain the occasional 190-pound rider who excels on flat courses. But because heavier cyclists generally can't climb well enough to challenge in mountainous races, they're often among the first victims of the selection process.

It's tempting to think that even if you're a bit heavy, you can compensate on climbs by working harder than the competition—or even developing a greater ability to suffer. But there's no way to beat the laws of physics.

As OLN TV race commentator Paul Sherwen noted during the 2001 Tour de France, "Courage doesn't make you into a climber."

Now Here's Some Good News

Is there any hope that a recreational athlete can get leaner? Of course. Work with what you have, accept the body type you were given, and enjoy riding. You may never reach the extreme leanness of elite athletes, just as you can't equal their achievements. But you can improve your health, shed excess body fat, ride closer to your potential—and enjoy a common bond with others who have an interest in fitness.

Here's how to do it without starving or riding 10 hours a day.

Avoid winter pigouts. First, don't let winter set you back in your quest for ideal cycling weight. Many riders finally are fit and lean by October, only to pack on 20 pounds in the cold months due to inactivity and plentiful helpings of holiday grub. (See: Jan Ullrich.)

The maximum amount it's safe to gain in winter, according to coach Chris Carmichael, is 10 pounds.

"If you gain more than 10 pounds over your [in-shape summer weight] it costs you too much time and effort to lose the excess when the season starts," Chris says. "You'll have to focus on losing weight rather than on the training that helps you get better."

Push some iron in the weight room this winter and push the pedals, too. But also push back from the kitchen table.

Eat fewer calories. Instead of adding pounds from October to April, those months are the best time to lose excess weight. Why?

- You aren't training as much so you don't need to consume as many calories.
- With no events to taper for, you have several uninterrupted months of steady training—ideal for a consistent weight loss program.
- You're lifting weights to help burn calories. Weights won't cause you to bulk up unless you're genetically programmed for an Arnold-like physique and you spend hours doing multiple sets.

A good resistance program will increase your muscle mass slightly but lead to an overall weight loss. The reason? Muscle burns calories but fat doesn't. So the more muscle tissue you have, the more active your metabolism. Also, a vigorous weight training workout raises your metabolism so you continue to burn calories at a heightened rate for several hours after you leave the gym.

Know how much weight you should lose. Unless you're positive that you're porcine, get a body fat analysis from your doctor, health club or a sports medicine clinic. Using one of several methods—skinfold calipers, bioelectrical impedance, underwater weighing—you can learn the precise percentage of your body weight that's fat.

Remember, elite male riders carry four to ten percent fat; elite women about five percentage points more. In contrast, sedentary American males are about 20 percent fat and American women are around 25 percent.

CAUTION! If your body fat percentage is already at an elite level, don't undertake a weight-loss program. You may be heavier than you'd like to be, but if it's muscle weight rather than fat weight, it's unhealthy to reduce.

Commit to a long-term plan. Successful weight loss isn't a quick process. Crash diets have one thing in common: They don't work. You go down fast and then you go back up, sometimes to an even higher weight. The steady loss of about one pound a week is more likely to permanently reshape your body.

Start in midwinter and you can hit your target weight in March or April—just in time for the new cycling season.

Here's the Plan

Although human metabolisms are quite variable, shedding pounds is essentially simple math: Burn more calories than you ingest, and weight loss must follow.

A pound of fat is equivalent to 3,500 calories. If you combine exercise and diet so that you use 3,500 calories more each week than you consume, you'll lose one pound every seven days.

Step 1: Cut Calories Painlessly

According to the math, you need to cut only about 500 calories a day. That's about the number of calories in two energy bars, three cups of whole milk or four teaspoons of butter.

Think about each food choice so you eliminate unnecessary calories—especially those from excessive fat, which come with health risks. Here are some examples. I'll bet you can quickly find other ways to cut calories from the daily diet you eat.

- Eliminate fatty snacks and eat fruit instead.
- Use skim milk rather than whole milk.
- Substitute low-fat yogurt for butter, margarine and salad dressing.
- Order meats and fish grilled rather than fried.
- Eat one cookie rather than two (or 10).
- Have half a bagel and jam with your mid-morning coffee rather than a high-fat muffin.

- Cut down on alcohol. Beer, wine and mixed drinks can add significantly to your daily caloric total.

Step 2: Increase Your Metabolic Rate

Exercise burns calories while you're working out. That's good, but here's something better: Exercise also elevates your metabolic rate for a time after exercise. You continue to burn calories faster than normal.

Studies show that intense exercise increases and prolongs this effect. To take advantage, include two or three interval training workouts each week (heart rate at least 85 percent of your maximum). They can be done on the bike indoors or out, or with crosstraining activities such as running, snowshoeing or cross-country skiing.

Weight training is important, too. Only muscle mass burns calories. Fat just sits there inertly, going along for the ride. Gain muscle volume for more calorie-consuming potential and less useless fat.

Step 3: Increase Your Burn Rate

If you can increase your total weekly exercise time by an hour or two you'll consume an additional 400 to 800 calories, depending on activity. Ride outside on weekends when weather permits. Add hour-long indoor trainer workouts twice a week. Run an additional eight miles. Lift weights three times per week instead of two.

Step 4: Periodize your Nutrition

You don't do the same training in winter that you do at the height of the cycling season. By the same token, it makes sense to change your nutritional patterns in the off-season.

"Periodize your nutritional program just like you periodize your training," says Chris Carmichael. "You aren't doing the long rides in winter that you do in summer. You don't burn as much glycogen so you don't need to eat as much carbohydrate."

"In the summer when you're training long and hard, 60 to 70 percent of your diet should come from carbohydrate. But in the winter, you can safely reduce it to 50 or 60 percent. This allows you to eat more protein [around 30 percent of total calories] to help rebuild muscle tissue and increase strength."

Above all, be consistent. Schedule daily nutritional planning like daily workouts and any other obligation. You can do it if you are willing to treat exercise (and eating) like a job.

Chapter 6

Resistance Training

This is a long chapter. Read it carefully because the activity it covers—weight training—is potentially the most important part of your off-season program.

I say “potentially” because in spite of its widespread acceptance in other sports, resistance training for endurance athletes is still a controversial subject.

It seems logical that greater strength would improve endurance performance. After all, don't many pro cyclists have bulging quads? Shouldn't the fast route to better cycling go directly through the weight room? What could be better than pumping iron all winter, then showing up at the first race of the season not only faster but buff as well?

It isn't that simple. As we'll see, there are important reasons for endurance athletes to strength train, especially in the off-season. But while authorities differ, **it's becoming increasingly obvious that toiling in the weight room, by itself, probably won't directly improve your cycling performance**—unless you're a novice for whom any physical improvement will pay off. In fact, too much lifting, especially for the legs, can negatively affect your training on the bike.

As Chris Carmichael points out, “Lifting and cycling are like oil and water—they don't mix well. When you're lifting heavy weights, you have to reduce cycling volume and intensity. And when you're riding hard, you can't do much in the weight room.”

What's the solution to this conundrum?

Once again, it's the P word. Says Carmichael, “It's a question of periodization. You must find a balance in the off-season. Make your strength gains over the winter and then convert that strength to cycling-specific power.”

To understand this crucial idea, you need to know the difference between strength and power.

Strength vs. Power

Strength is the ability to move a certain amount of weight without regard to the time it takes to do so. A weightlifter who needs two seconds to get 400 pounds from the floor to an overhead position is just as strong as another lifter who takes only one second. They both moved 400 pounds the same distance.

In the same way, a cyclist who, together with his bike, weighs 180 pounds and rides a century in seven hours has done the same amount of work as another rider with the same combined bike/body weight who scorched the century in five hours. They both moved the same amount of weight the same distance, so they're equally strong.

Power is different. It's defined as work over time. So riding the century in five hours takes much more power (measured in watts) than hauling the same amount of weight a hundred miles in seven hours.

Obviously, to be a better cyclist you need more power. So why worry about strength of the grunt-and-groan, weight-room variety? Why not just train for power instead by riding intervals and hard climbs?

The answer is that **strength is a precursor to power**.

Power is built in a continuum that progresses all the way from low-repetition strength in the weight room to high-cadence pedaling. You need strength to build power.

What Studies Show

It makes intuitive sense that "you can't make a strong cyclist out of a weak person." In practice, however, there's a tremendous gap between the physiological abilities needed to perform a few repetitions with a heavy weight compared to the thousands of low-resistance repetitions that characterize endurance activities such as cycling or running.

A quick look at lab studies shows why this issue is so confusing.

In one study, previously untrained men cycled to exhaustion, then did a three-times-weekly resistance program consisting of standard lower-body exercises (leg presses, hamstring curls, calf raises) in sets of 10-12 repetitions. After eight weeks, cycling performance in the test improved, even though VO_2 max, a key endurance indicator, didn't.

However, in a study using experienced riders, a similar weight training regimen caused their performances to *slow* by nearly two minutes in a one-hour, 40K time trial.

Why the discrepancy? Experts theorize that the sedentary subjects improved their cycling performance with weight training because, due to their lack of fitness, any physical improvement would result in faster riding. But the experienced cyclists got worse because when their regular training on the bike was combined with the added stress of resistance training, they became overtrained and too tired to perform well.

Empirical Evidence

Experienced coaches differ, too. Chris Carmichael recommends building leg strength with low repetitions and heavy weights in the winter, then switching to the bike for high-repetition power work in the form of intervals up steep hills.

Conversely, cycling physician and trainer Max Testa counseled the Motorola Team to begin the winter with 3-4 sets of 12-18 reps with medium resistance, then progress to 3 sets of 25 reps followed by 2 sets of 50 reps with light weights. His reason for high-repetition/low resis-

tance leg training: “When you pedal you use a very small percentage of maximum strength on each pedal stroke.”

To further confuse the issue, there’s the case reported by legendary researcher Tudor Bompa, Ph.D. Bompa chronicled a pursuit cyclist who weighed 154 pounds and left cycling to become a power lifter. After three years in the iron game, he was able to do full squats with 585 pounds. Then he returned to cycling and shaved five seconds from his best time in the individual pursuit.

As Bompa told me in a letter, “Because he applied the ‘periodization of strength’ concept of training, he was able to recruit more fast-twitch fibers and, as such, display more power. Cyclists can improve their performance if they improve their power output.”

Case histories are fraught with problems, but my personal experience is illuminating. As mentioned earlier, I was an undersized but enthusiastic football lineman who was able to compete in college because I gained nearly 50 pounds through a combination of weight training and conscientious overeating. When I started bike racing, the pounds melted away and I returned to my normal weight. But the experience sold me on the benefits of weights.

One winter, after a disappointing bike racing season, I determined to return to my athletic roots. For four months, I did exhausting squat and leg press workouts—as many as 50 reps of squats with 200 pounds and sets of 10-15 reps with more than 700 pounds in the leg press.

I couldn’t wait until spring. I had visions of not only blowing everyone away on hills but also cracking crankarms and tearing spokes out of my rear hub.

But instead, I learned that all that work had made me pretty good at squats and leg presses but not so good at cycling. I got dropped like a rock in the early races and it took several months of riding before I came around.

The moral: The physiological law of specificity can’t be avoided. Weight-room strength has to be converted to cycling-specific fitness before it’s of much use on the bike.

The ‘Weak Link’ Theory

To make sense of this phenomenon, consider what Steve Johnson, Ph.D., calls the “weak link” theory. Steve is the CEO of USA Cycling, an exercise physiologist, and a masters cycling world champion.

Steve maintains that there’s always at least one weak link in any person’s power production mechanism. It might be strength, aerobic capacity, lactate tolerance or endurance. If you lack strength, weight training is necessary. But if you’re a former football player who can leg press substantial weight, the weak link is probably in the aerobic system and it makes sense to spend the majority of training time riding rather than lifting.

Does this mean that most riders are better off skipping weights and spending their time on the bike instead?

No. Endurance athletes should strength train even if it won't make them faster. Here's why:

Use it or you'll lose it. The body has a disturbing tendency to lose muscle mass as we age. According to some authorities, strength stays relatively high till age 50, then begins a precipitous decline of as much as 10 percent a year. If the slide continues unabated, we face a lengthy period of physical decline and worsening performance. Eventually we can't even perform simple tasks of daily living, such as getting out of chairs or carrying groceries. As we age, we need to lift to keep all the muscle that it's possible to keep.

Chris Carmichael has this advice for masters-age riders: "You need year-round resistance training, including exercises for the legs. Leg work should be lighter during the cycling season but it should still be done."

Coach Joe Friel agrees that masters should continue weight training year round, noting that "older athletes seem to have more trouble gaining and maintaining muscle strength."

You'll look better in a skinsuit. Well, at least a little better. It's a myth that if you lift, you'll automatically bulk up. People who get big, rippling muscles from weight training must be blessed with advantageous hormones and train using specific regimens. Most people make more modest gains in weight and size. If you're an endurance athlete who doesn't want to gain weight, you can develop a routine that will increase your strength significantly but not your size.

Weight training is social. At the local health club, you'll meet people who share your fitness interests. It's easy to strike up a friendly conversation. Gyms used to be macho and competitive testosterone dens, but now in most cases they're friendly and welcoming to everyone.

Weight training is solitary. Okay, I just said weight training is social. But some people like to train at home because they get a better workout when they don't have to wait for a bench or a machine. Scheduling is easier, too. They can fit training into any open slot and don't waste time driving to the health club. Another option: Visit the gym on weekends when you have more time, and lift at home during the workweek.

Weight training is simple. Weight training is more properly termed "resistance training." It doesn't really matter what provides the resistance. It can be fancy exercise machines, free weights, or simply body weight. Time-tested exercises such as pull-ups, pushups, dips and body-weight squats work great. So does using gravity as resistance—like jamming up short hills in a big gear (more on this later).

Strength prevents injuries. A strong athlete is a more injury-resistant athlete. In cycling, an upper body with good muscle tone is less likely to get hurt in a crash. Think of it this way: Resistance training keeps your chassis strong so you can work on your motor.

So here's the bottom line: Weight train not just for next season, but to ensure that you're still exercising—and independent—decades down the road.

The Exercises

The specific exercises you choose—and the way you set up your resistance training program—should depend on:

- your strengths and weaknesses
- your goals on the bike
- your time available for training
- your interest in pursuing strength development

I suggest a general approach here. Because it is generic, it won't work for everyone. In fact, it may not work for you. But because its principles are sound, you can use it to customize your own program. Better yet, find a cycling coach, trainer, or strength coach certified by the National Strength and Conditioning Association who knows about cycling. He or she can help you design a sound program.

Begin with the number No. 1 rule for resistance training for cyclists: Do only those exercises that help improve your riding ability. This minimalist approach saves time better spent turning the pedals.

There's no need to do certain exercises that are staples of most weight programs. Take bench presses, for instance. That movement isn't necessary when you ride your bike. Upper-body pushing exercises are important only to balance pulling exercises, and to give you sufficient strength to support yourself on the handlebar. Simple push-ups will do the job. By the same token, dead lifts and power cleans might make it easier to put your bike on the roof rack, but they don't directly affect your pedaling.

Next are the exercises that *will* help your cycling.

TIP! I suggest the number of sets and reps in the training schedules found in [chapter 7](#) and [chapter 11](#). But don't be afraid to do your own thing. For instance, when I'm using the standard recipe of several sets of 8-15 reps in most exercises, every fourth or fifth workout I'll use half the weight and do only one set of 30-50 reps. It's a great way to add variety and endurance capacity.

Upper-Body Pulling

These exercises strengthen the muscles that help you pull on the handlebar powerfully during sprints or hard climbing. Choose one or two per workout:

PULL-UPS

- Grip the pull-up bar with your hands about shoulder width apart and palms facing away.

- Pull your chin to the bar, hold for one second, then lower slowly to the hanging position.
- If you can't do at least five reps, place your foot on a chair and "cheat" with one leg to help push you up.

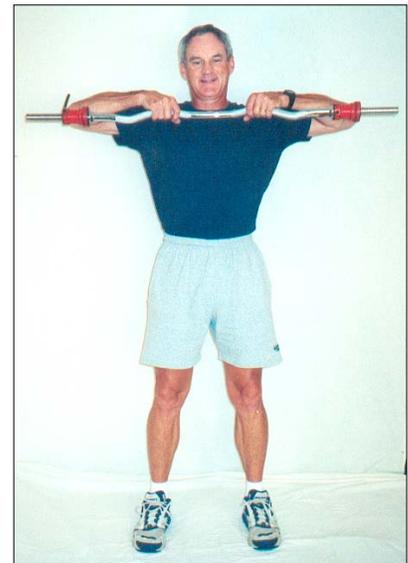


DUMBBELL ROWS

- Bend at the waist and put your left hand on a bench. Keep your back flat and head up.
- Hold a dumbbell in your right hand with arm extended straight down.
- Pull up the dumbbell till it touches your waist. Keep your elbow in. Pause for one second at the top of the movement then lower slowly to the starting position.
- After the requisite number of reps, do the same with your left arm.

UPRIGHT ROWS

- Stand with your feet shoulder-width apart.
- Hold a barbell slightly below waist level with your hands about six inches apart, palms facing your thighs, and arms straight.
- Pull up the barbell to collarbone height, hold one second, and lower to the starting position.
- Don't cheat on this exercise by bending your knees. Use a weight light enough to do 10-15 reps with correct form.



LAT PULL-DOWNS

- Hold the bar with palms facing away and slightly more than shoulder-width apart.
- Pull the bar down to the front of the chest, pause one second, and return it slowly to the starting position.
- Don't pull the bar down behind your neck. This could injure your shoulders.

SEATED ROWS

- Sit at the machine with your legs braced and knees nearly straight.
- Place your hands on the rowing handle about a foot apart with palms down.
- Pull the handle to your stomach, pause one second, and return to the starting position.
- Keep your back straight and a 90-degree angle between upper and lower body. Don't bend forward at the waist.



Upper-Body Pushing

These exercises strengthen muscles that you use to lean on the handlebar for long periods during lengthy training rides or events. Choose one per workout.

PUSH-UPS

- Stretch out in a prone position and support your body on shoulder-width hands and toes. Keep your back straight and head up. For additional resistance, elevate your feet as pictured.
- Lower your chest to within three inches of the floor, pause, and push up to the starting position.
- Don't dip your head or let your back bow.



DIPS

- Position a pair of chairs or a dip rack so the supports are shoulder width apart.
- Support yourself on your hands with your arms straight.
- Bend arms to lower yourself till your upper arms are parallel to the floor. Keep your elbows in. Push back to the starting position.
- Don't do this exercise if you have a history of shoulder injuries.

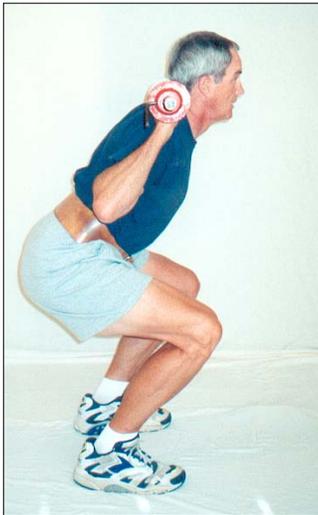
TRICEPS EXTENSIONS

- Stand facing the lat machine with the bar near shoulder height.

- Hold your elbows to your sides and grip the bar with hands about a foot apart.
- Press the bar downward to waist level, hold, and return slowly to the starting position.

Leg Exercises

These strengthen the prime movers of the cycling motion. Choose one exercise per workout.



SQUATS

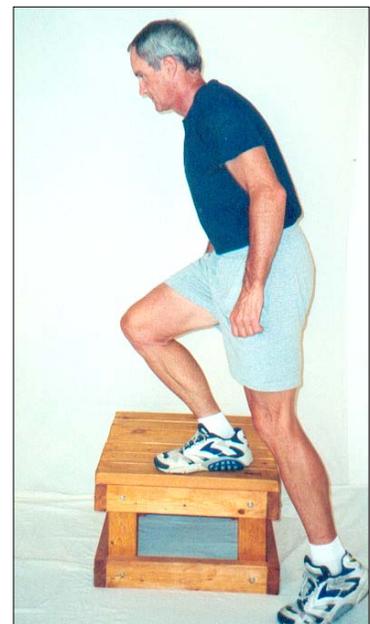
- Face the squat rack, step under the barbell, and position it on your upper shoulders about two inches lower than the base of your neck on the trapezius muscles. You'll probably be more comfortable if you pad the barbell with a towel or foam pipe insulation.
- Lift the barbell off the rack and step back about three feet.
- Stand with feet about shoulder-width apart and pointed either straight ahead or angled the same way they are on the pedals. If you toe in or out slightly when pedaling, reproduce that foot angle when you squat.
- Squat down until your thighs are approximately parallel to the floor. Don't go lower. Pause slightly, then return to the starting position.
- Keep your back straight and upright. Don't lean forward.

CAUTION! Squats are the most dangerous exercise in this list when done incorrectly. Please get a demonstration from a strength training professional if you don't know how to do them.

STEP-UPS

These are done one leg at a time, just like pedaling. They are easier on your back than squats because you don't need much weight for resistance.

- Face a sturdy bench or platform that's about 14 inches high (slightly below knee level).
- Put your right foot on the platform.
- Step up so you are standing on the platform balancing on your right leg. Don't push off with the left leg. Use it only for balance so your right leg does all the work.
- Step back to the starting position. Do the number of reps called for in your program with the right leg.



- Repeat with the left leg.
- For more resistance, hold a light barbell across your shoulders or hold a dumbbell in each hand.

LEG PRESSES

These are done on a “hip sled” found in health clubs. Leg presses are excellent for cycling strength. You can use as much or more weight as in squats, but there’s less risk of injury because you’re seated.

Because proper technique varies with different kinds of apparatus, please consult a staff member at your health club before you try this exercise. Generally, you should place your feet about the same distance apart as they are on a bike, and your knees should bend no more than they do at the top of the pedal stroke.

Core Exercises

These strengthen your torso, your core. They’re crucial because a strong midsection stabilizes your body on the bike while your legs whirl below. Include crunches and back extensions in every workout:

CRUNCHES

- Lie on your back with knees bent and legs propped up on a chair or held up in the air with the knees slightly flexed.
- Put your hands to your ears or fold your arms on your chest.
- Curl your upper body up until your shoulder blades leave the floor. Hold one second and lower slowly. Relax a moment and repeat.
- Don’t interlace your hands behind your neck. You will have a tendency to pull up and possibly strain your neck.



BACK EXTENSIONS

- Lie face down on the floor with your hands behind your head.
- Lift your heels and shoulders simultaneously, pause for one second, and relax to return to the full prone position. Repeat.

Don’t forget **neck exercises**. A helmet can save your head in a crash but only strong muscles can save your neck.

Isometrics or a machine for neck exercises, like the “four-way neck machine” found in many clubs, are the safest ways to exercise the neck muscles. Ask for instructions before you use the machine.

CAUTION! The traditional neck exercise is the wrestler’s bridge (photo), but it can cause more harm than good. Don’t do it unless you have a background in wrestling or football, or have experience with the movement and know that it won’t injure you. Everyone else should use isometrics or a health club machine.



Don’t Forget to Ride!

Weight training should never be done in isolation from riding. After all, you’re pumping iron so you can lay a foundation for better cycling performance, not to become a power lifter.

Chris Carmichael sums it up best: “Build strength in the off-season with relatively low-rep leg work. While you’re doing this in the weight room, you’ll be riding with a high cadence and working on your spin, maybe using a fixed gear. Then, when you’ve developed the strength base, convert it to cycling power with low-cadence, high-resistance work on the bike.”

See the next chapter for ways to combine weights and cycling to build power.

The Least You Can Do

Little time or inclination to lift weights, but you still want to get stronger? Here’s a quick-and-convenient resistance program that’ll help. It’s also great for strength maintenance during the cycling season.

This program takes only about 15 minutes, twice a week. It’s done at home, immediately after easy recovery rides. You also can do it in a hotel fitness room when you’re traveling.

At home, all you need are a pull-up bar, a light barbell set and several dumbbells.

Do these exercises with body weight:

- crunches
- pull-ups
- push-ups
- squats

Do these with weights (or with your suitcase if no iron is available):

- dumbbell rows
- upright rows

This is a minimalist program so do only one set of each exercise. You'll still get lots of benefit. Some studies show that one set provides most of the benefit of multiple sets.

As for reps, aim for sets of 12-20 dumbbell rows and upright rows, 5-10 pull-ups, 15-50 push-ups, 50-100 crunches, and as many as 100 bodyweight squats (like deep knee bends but don't go lower than where thighs are horizontal).

That's it! This routine is very quick, but when done twice a week it will increase your strength in winter and maintain it in summer.

Chapter 7

Convert Your Strength to Cycling-Specific Power

Lance Armstrong revolutionized cycling in several ways. Of course, he showed us that it's possible to come back from cancer and regain top form. Also, unlike more traditional European racers who try to be competitive from February to October, Lance focused intently on the one race that mattered to him—the Tour de France. He used other events to achieve peak form for the Tour.

But Lance's most important contribution to modern cycling practice was his ability to generate great power at pedaling speeds 15 to 20 rpm higher than most of his contemporaries. When Lance pedaled, it appeared as if he was turning the cranks almost too fast. Watching him on TV, it was hard to resist the urge to yell "Shift! Shift!" as he spun his legs into a blur. It looked like he could go faster by using a bigger gear.

High-rpm riding has long been a tenant of Lance's coach, Chris Carmichael. In the early 1990s when Chris was the U.S. National Team coach, he was preaching the merits of a high cadence and I passed along his ideas to the cycling public in several magazine articles.

But high-cadence riding didn't catch on. Lance wasn't sold on its merits and hadn't trained himself to spin fast. Then cancer interrupted his career. When he returned, he displayed both greater pedaling speed and lighter body weight. The result was an increased power-to-weight ratio. The muscular classics rider was transformed into a lean, agile climber who could still time trial as well as anyone. That's the formula for Tour success.

Want some of the same? You can improve your pedaling speed—and power production, too. This transformation doesn't happen overnight, but the off-season provides a four-month opportunity.

Also, because increased power production is a combination of strength and fast pedaling, it makes sense to work on this skill in the winter when you're in the weight room. That's why I've placed this chapter here, right after the one on resistance training.

Why High Cadence Makes Sense

First, let's see why fast pedaling in a moderate gear is more efficient than slow pedaling in a larger gear.

EXAMPLE! If you climb a hill in a gear of 39x25-teeth at 100 rpm, and then climb the same hill in a much bigger gear of 53x17-teeth at 50 rpm, your road speed will be exactly the same. The rear wheel turns 1.56 times with each pedal revolution in 39x25. It turns 3.12 times with each pedal revolution in 53x17.

So, why is 39x25 at 100 rpm better than 53x15 at 50 rpm if speed is identical? The reason has more to do with physiology than gearing.

It takes the same amount of work to get up a hill at, say, 10 mph no matter whether you pedal rapidly or slowly. But when you grind that big gear, your leg muscles do a large percentage of the work on each pedal stroke. Your quads are taxed almost like you're doing squats.

When you spin the small gear with a fast cadence, the work is divided into more pedal revolutions. Each quad has to work more often but at a lesser resistance. As a result, your cardiovascular system is stressed but your quads are spared.

It's easier to train your body to tolerate a high aerobic load than a high muscular load. So pedaling fast makes sense. As a bonus, it's easier on knees.

Lance learned this secret. His cardiovascular fitness was superb, approaching that of elite distance runners whose legs have to turn over very quickly against minimal resistance.

There's an important caveat to this approach, however.

Lance pedaled low gears fast, but they weren't so low that he was going slowly. On a steep grade where the average recreational rider struggles out of the saddle to keep a 39x27 turning over at 60 rpm, Lance used a 39x23 and pedaled at 95 rpm. (His pro competitors would use 39x19 and pedal at 75 rpm.)

It's not enough to twiddle a tiny gear fast. The trick is to turn a moderate gear fast. Lance was dominant because he combined fast, agile pedaling with considerable strength.

Here's what these insights mean for your training:

- You must learn to pedal quickly.
- You must build strength in the weight room with leg exercises such squats, leg presses and step-ups.
- In the spring, you must convert weight room strength to cycling power with low-rpm repeats on hills.

Chris Carmichael isn't the only cycling coach to recommend these workouts. Dr. Max Testa likes them, too. This was his prescription for the Motorola riders: "Ride climbs of four-to-six minutes at 50 to 60 rpm to build strength and muscle mass."

Alternate high-gear climbing (to increase strength) with low-gear climbing (to increase cadence).

As your important events come near in the spring and summer, continue intervals at your normal cadence. After a winter of working on your spin, you'll be able to pedal a larger gear faster.

Below, I suggest an off-season sequence based on these ideas.

Fixed-Gear Cycling

Lance worked on leg speed the old-fashioned way, with fixed-gear training in the winter.

A fixed gear is the same as the drivetrain on a track bike. There's only one chainring and one cog, and you can't coast because there's no freewheel. When the rear wheel rolls, the crank turns. You're forced into a smooth, round, fast pedal stroke—especially when going down hills!

According to Chris Carmichael, after Lance's end-of-season break from training, "He used a fixed gear during the first four weeks of off-season workouts. During this time, he was lifting fairly heavily too so the fixed gear acted as a kind of governor. Ninety minutes or so on a fixed gear is quality training because you have to pedal the whole way. You're forced to keep the cadence high so you're more aerobically active."

Fixed-gear road bikes were used for winter training and even racing for decades. British riders did time trials as long as 24 hours on them because of the efficiency of the drivetrain and weight saved by eliminating derailleurs, shifters and all but one cog and chainring. It's a training method that still has value today, as proven by Lance and Chris.

Interested? The next trick is to get a fixed-gear bike.

- Buy a used track bike and convert it to road use by installing brakes. Be sure the seatstay bridge and the fork crown are drilled for caliper attachment.
- Buy a new fixed-gear bike, such as the moderately priced models made by Fuji and Surly for use on the road. They're drilled for brakes and ready to go.
- Turn an old road bike into a fixed gear. Here's how Rob, a subscriber to our *Road-BikeRider.com Newsletter*, did it:

"For less than \$150, I got a rear wheel, cog, front chainring and chain from Harris Cyclery in Newton, MA. I'm not wasting the old bike, and I get a great fixed-gear bike.

“It certainly makes familiar routes exciting! No matter how many times you say to yourself ‘don’t coast,’ you (or at least I) eventually forget. Yee hah!”

Because this conversion is somewhat technical, ask your shop to set it up if you don’t have the tools or expertise.

In addition to improving your pedaling, a fixed-gear bike has another nice advantage for off-season training. It’s easy to clean and maintain because the drivetrain is so simple. You won’t suffer malfunctions because derailleurs or cables get icy or clogged with road grit.

When learning to ride a fixed gear, the biggest obstacle is the ingrained tendency to coast—as Rob just noted. You get an instant reminder that it isn’t possible. Don’t ride in traffic until you’ve overcome this habit.

Practice first in an empty parking lot or the vacant streets of an industrial park on the weekend. It shouldn’t take long to feel confident enough to move to the road. Ideally, you can ride relatively flat courses. Steep climbs mean pedaling at a potentially knee-wreckingly low cadence. On steep descents, you have to pedal very quickly and brake to keep the bike’s speed under your cadence redline.

Putting It All Together

Okay! You’re ready to begin the three-part program to build greater cycling power. A quick review:

1. Improve pedaling speed (maybe with a fixed gear).
2. Build greater strength in the pedaling muscles.
3. Convert that strength to cycling-specific power.

Here’s a sample program that accomplishes these objectives.

OCTOBER

Weight room

- If you have lifted all year, take October off. Don’t lift. You need a break, so do other activities that stress your upper body—mountain biking, swimming, hiking with poles.
- If you didn’t lift last summer, begin with the maintenance program in [chapter 6](#). Add a few simple barbell exercises as you feel stronger. Don’t strain. This is simply to accustom your muscles to the movement.

CAUTION! If you plan to do squats in winter, start light. Use no more than your body weight. Squats can make your hamstrings extremely sore if you begin with substantial weight.

Cycling & crosstraining

- Ride for fun.
- Do other aerobic activities for fun (see [chapter 8](#)).

NOVEMBER 1 TO DECEMBER 14

Weight room

- Gradually increase sets from 1 to 3. Reps should remain in the range of 12-20 for most exercises.

Cycling & crosstraining

- Focus on fast, supple, easy spinning. You might choose to use a fixed gear.
- Once a week, do a longer aerobic workout, on the bike or with crosstraining

DECEMBER 15 TO JANUARY 31

Weight room

- Work on strength. Increase sets to 3-5. Increase resistance and reduce reps to 6-12.

Cycling & crosstraining

- Once or twice a week do short, hard efforts in a large gear at a low cadence of 50-60 rpm. Use hills on the road or use an indoor trainer.

CAUTION! These efforts can hurt your knees. Warm up thoroughly. Don't attempt them in freezing temperatures or if you have a history of knee problems. Have at least 500 miles of easy spinning before you do big gear/low cadence workouts.

FEBRUARY 1 TO MARCH 14

Weight room

- Begin the process of converting strength to cycling-specific power by reducing sets to 1 or 2, reducing weight dramatically, and increasing reps to as many as 50.

Cycling

- Introduce longer intervals at a higher cadence. For example, repeats of 3 to 5 minutes at 90 rpm.
- During these 6 weeks, gradually increase cadence until you're doing intervals at 95 to 110 rpm.

MARCH 15 TO MAY 1

Weight room

- Scale back your resistance training to maintenance level. The program outlined in [chapter 6](#) is a good example.

Cycling

- Now's the time to introduce a full range of interval work into your cycling program.

CAUTION! Be careful when adding strenuous weight training workouts or high-intensity cycling. It's easy for your enthusiasm to get you into trouble. Too much work without sufficient rest will lead to overtraining rather than improvement. As Tudor Bompa warns, "Intensity is a dangerous game if you play it too much."

Chapter 8 Crosstraining

Exercise physiologists say that to be a better cyclist, you have to ride. The law of specificity states, not surprisingly, that we get better at those activities we practice. Muscles that pedal are better at pedaling than muscles that run or swim or do squats.

Still, because riding every day all year is a sure way to burn out on cycling, crosstraining with other activities is an important part of a productive off-season program.

The pros, with their nine-month seasons, love to crosstrain because it's a vacation from the bike and an excuse to venture into a different sport.

"Crosstraining is unstructured for the pros I coach," says Chris Carmichael. "It's more supplemental training than base training [for cycling]. They do whatever sport they like for the first four to six weeks after they come off their rest period and begin to train. Some like to do mild running, especially on trails, or swimming. George Hincapie likes basketball. Others ski."

EXAMPLE! In the 1980s, Andy Hampsten was one of the brash Americans who were breaking the European cycling mold. Instead of knuckling down to a traditional off-season program, he hung out in Boulder, CO, with other upstarts such as Ron Kiefel and Davis Phinney.

"I had a great time training in the off-season," Andy recently told *Cycle Sport* magazine. "I skied, I hiked for hours, climbed rock faces, mountain biked and ran up mountains. It got me psyched for the next season. While I was doing this, my buds in Belgium were riding in the rain."

Crosstraining for fun and regeneration is important for us recreational riders, too, even though we don't rack up the 25,000 miles a year that the pros routinely endure.

Mental and Physical Benefits

Crosstraining gives us a mental timeout. We tend to fall into a psychological rut when we do one sport for months at a time. Sure, cycling is our passion. But just as lovers need some time away from each other to make the flame burn brighter, so we need to be unfaithful to the bike for several months each year. (Well, maybe the metaphor is a little forced—but you get the idea.)

Crosstraining gives us physical variety. Cycling is a repetitive and nearly unvarying motion. Your leg muscles get accustomed to going in circles while your upper-body muscles barely move, holding your torso steady above your spinning legs. Doing something else for several off-season months can help you avoid becoming a one-dimensional athlete. It'll wake up some sleeping muscles that you didn't know you had.

It's important to be a bike-riding athlete, not simply a bike rider. If all you do is ride, your other athletic capabilities will erode. So keep your general athletic skills honed with running, basketball, skiing, weight training, swimming or any other activity you enjoy. It's even helpful to have goals in different sports to give direction to your off-season training.

EXAMPLE! My secret athletic ambition outside cycling is to get on the podium at masters track and field nationals in the hurdles when I'm 65. I ran hurdles in my youth and I still love the feeling of skimming over the barriers. Let's see—I have nine more years to revive my skills....

Crosstraining helps us use winter. It's possible to ride outside in very nasty weather as we saw in [chapter 4](#). But running, snowshoeing and cross-country skiing are much better cold-weather sports in frigid climes because there's less speed and, therefore, less windchill. Crosstraining is a great way to rack up high-quality aerobic hours when the weather precludes riding. And some forms of crosstraining, such as running, are particularly useful when time is short or darkness threatens.

Rules for Crosstraining

Pick a compatible activity. The key to surviving winter with your aerobic fitness intact is to choose a crosstraining activity that you enjoy and can do with a minimum of fuss. Running and fast walking are great choices for weekdays (when you're busy) because they are quick and don't require special equipment. On weekends, consider snowshoeing or skiing (on a track or in the backcountry). If you don't have snow, roller skis or inline skates are a great change of pace.

Use gravity. Colorado cycling coach Mike Devecka was a four-time Olympic biathlete and a bike racer. In 1986, the World Road Championships were held in Colorado Springs. Many of

the European stars rode a local race in Crested Butte shortly before the worlds to acclimatize. Devecka decided to see what he could do. Although he was 15 years older than most of the pros and he trained primarily as a cross-country skier, he made the top 10.

With results like that, it's important to listen to Devecka's rule for off-season training: "I don't care what you do, as long as it's uphill."

Run, ski, hike or snowshoe uphill and good things happen. Your quads come into play, and they're the same muscles that power your bike. You'll breathe hard, taxing your aerobic system. And you'll stay warmer because climbing is slow going and shields you from windchill.

Remember muscle memory. When you're crosstraining, don't forget the bike. Perform two moderately intense cycling workouts each week to retain "muscle memory." You don't want your legs to forget how to pedal. These workouts can be done indoors, if necessary (see the next chapter). When spring comes and you get back on the road, you'll be much farther ahead compared to riders who didn't ride at all during the winter.

CAUTION! When your muscles are accustomed to pedaling, injuries can result when you switch to a sport putting different demands on your joints and connective tissue.

"The danger in crosstraining is injury," warns Chris Carmichael. "Pros become so specialized on the bike during the season that it's easy for them to get hurt when they do something different."

Begin all alternate activities slowly and gently to avoid injury.

EXAMPLE! Cyclists have such well-developed cardiovascular systems that it's easy to run a relatively long way the first time out. Fight that temptation. Your knees and Achilles tendons aren't used to pounding the pavement, so they'll be the first links in your biomechanical chain to complain. You've never experienced soreness like the kind that'll grip your leg muscles if you start your off-season running program with a five-mile trot up and down hills. Instead, break in easy by mixing walking with jogging.

I begin off-season running with a five-mile run/walk. I run only 100 yards out of every half mile the first time out. Then I gradually increase the distance of the running sections. My goal is never to get sore muscles during the changeover from cycling to running.

Stretch (Whether You Like It or Not)

Stretching is a controversial topic for endurance athletes. Some studies show that it reduces injuries while others have found that it increases them, especially among runners.

Lance Armstrong was a late convert to stretching. According to cycling injury expert Andy Pruitt, Ed.D., Lance once had a terse comment to suggestions that he needed to improve his flexibility: “I don’t stretch,” accompanied by a steely-eyed stare.

However, according to a number of sources, Lance stretched as much as an hour a day in preparation for the 2001 Tour de France. The nature of his program then and in later years was a closely guarded secret.

Stretching may even improve cycling ability. According to Dr. Max Testa, “One study shows that cyclists increased their quad power five percent just by stretching their hamstrings. Greater flexibility in the hamstrings created better utilization of the quads.”

Good stretching programs are highly individual. If you have significant hamstring and low-back tightness, these areas should be targeted. The best single source for a wide variety of stretching routines is the bountifully illustrated book called *Stretching*, by Bob Anderson (www.stretching.com). Another approach is to consult an athletic trainer or physical therapist who can evaluate your flexibility and create a personalized stretching program.

The key stretch for cyclists works the hamstrings. It’s simple. Just sit on the floor with your legs straight in front of you about two feet apart. Keep your knees slightly bent. Lean forward over your right leg and lower your chest toward your thigh until you feel a slight stretch in the low back and hamstring. Hold that position for 15 to 30 seconds, then sit up. Do the same over the left leg. Then do each leg two or three more times, gingerly increasing the amount of bend at your waist. Never stretch to the point of pain.

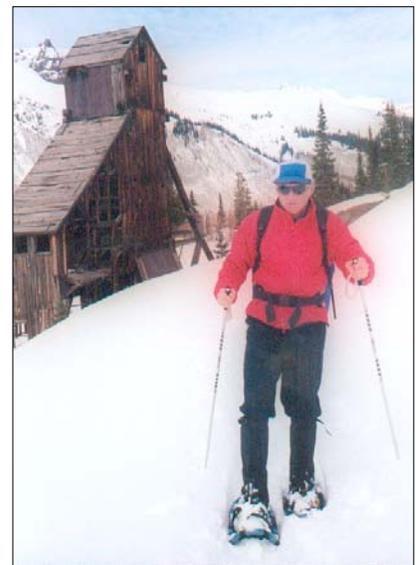
TIP! Many cyclists dislike stretching because it’s so inactive. They think it’s a waste of precious time, so they don’t schedule any for it. If this sounds like you, simply flop on the floor and do your routine while watching a TV program. Get stretching’s benefits instead of lying inertly on the couch.

Two Ways to Use Snow

The three simplest crosstraining activities are also the most useful because they’re aerobically demanding and impact many of the same muscles used for pedaling.

There’s just one catch: You need good snow for two of them. I know this leaves out a lot of you. But for those blessed with plenty of the white stuff like I am in western Colorado, great crosstraining is at hand.

Snowshoeing is the fastest-growing winter sport, and for good reason. It’s easy to learn, fun to do, and it lets you enjoy your favorite hiking trails in winter as well as summer. Snowshoeing is also a tremendous workout whether you tramp along through unbroken snow or run on packed trails. By using ski poles you can involve your upper body, too.



Actually, you don't even need snow if you don't mind some strange looks. Snowshoeing on a grassy field or the beach has plenty of aerobic benefits, too.

Cross-country skiing needs better snow than snowshoeing. It can be done using the classic diagonal stride or the newer skating technique. Both involve the upper body and work the quads almost like pedaling.

A packed track is necessary for skating and it makes the classic style more fun. Or, simply break trail through fields and woods. It's guaranteed to get your heart rate up. Once you've packed out a track, retrace it so you can kick and glide.

To hone your endurance in either of these activities or when running, include some interval training by going harder on uphill sections, then recovering on the downhills (just like on the bike).

How to Run Right

Plenty of studies show that while cycling can improve running performance, running does very little to make you a better cyclist. Main reason: The pedal stroke is powered primarily by the quads and glutes; running depends on the calves and the hamstrings.

Still, some pro teams have experimented with running in the off-season. In 1996, Nicholas Torrados, M.D., then medical director for Spain's pro ONCE team, said that the riders' early-season training included one hour of walking in the morning before they got on the bike. Further, "They also do uphill running on a treadmill or outside."

Note that Dr. Torrados' athletes practiced the key to making running helpful to cycling—they did it *uphill*. Remember Deveck's rule!

Running on the flat doesn't engage the same muscles that are used in the pedal stroke, but running uphill does. It uses the quads and glutes in a similar fashion to pedaling.

If you don't have hills in your area, stairs are a great substitute. Run some twice a week. Look for a tall building with stairwells that are uninterrupted for at least five floors. Run up, walk down, and repeat several times. Stadium steps are just as useful and get you outside, too.

Combine uphill running with two rides or trainer sessions per week to keep your cycling muscle memory and convert running fitness into cycling fitness. Go easy till your legs are conditioned to running. Always walk down hills or steps to avoid pounding your knees and hips.

You can also "run uphill" on an inclined treadmill. The advantages include a softer and uniform running surface. You also avoid the dangers of descents. Just step off the treadmill when you're done.

Running has another clear advantage over other aerobic crosstraining activities: It's quick. Pull on running shoes and appropriate clothing, and go. Darkness, snow or cold rain are a lot easier to handle while running than on the bike. You can get a great running workout in less

than 60 minutes from shoes to shower. This ease makes running the exercise of choice when traveling.

TIP! To lessen the chance of injuries that sometimes accompany running, wear high-quality shoes that are designed to work with your type of foot strike. People at the running store can advise you, perhaps after watching you run briefly on a treadmill.

Dress for Duress

Running, snowshoeing and cross-country skiing are “hot and wet” sports. Because they’re so physically demanding, you’ll quickly work up a sweat. It gets even wetter if you’re on snow and falling once in a while.

Dress in layers for all of these sports. The principles are the same as dressing for cycling in cold weather (see [chapter 4](#)). In fact, you can use the same clothing. Always wear moisture-wicking fabrics rather than cotton. Good choices include a wool or polypro base layer, tights, a light fleece insulating layer on your upper body, and a wind shell with a full-length front zipper for ventilation. Wear a knit hat and gloves.

If you’ll be venturing into the backcountry, carry a pack containing another layer of fleece, warm mittens and standard survival gear including matches, map, compass, water, food, a space blanket and a first-aid kit.

Endurance Workouts

Four-hour rides are hard to do in winter because it’s cold. The trick is to build endurance by combining training modes.

For example, ride the indoor trainer for 30 minutes, run for 45 minutes, then get back on the trainer for another 45 minutes. Or cross-country ski for a couple of hours, then do an hour on the trainer.

Hydration and Sun Protection

We don’t associate winter with dehydration and sunburn. But the cold, dry air of winter sucks the water out of you with each breath (especially at higher altitudes).

Performance decreases significantly when you lose as little as two percent of your body-weight as fluid, so make a concentrated effort to stay hydrated.

Drink plenty every day, and keep a bottle next to your bed so you can drink at night if you wake up. Pre-hydrate for workouts by downing 16 ounces of sports drink an hour or two before exercise. Its carbohydrate will increase your energy level, too.

When snowshoeing or skiing, use a fluid source such as a back-mounted hydration pack under your jacket. For running, a single-bottle holster that attaches around your waist prevents bouncing on every stride.

Sunburn is another danger, especially when the sun's rays are intensified by reflection off snow. Snowshoers and skiers have been known to suffer severe sunburn under their noses or chins. Protect yourself by using plenty of sunscreen. Reapply periodically if you're out for long.

Chapter 9

Indoor Cycling

Most cyclists love to be outdoors, even in winter. After all, fresh air, sunshine and scenery are big attractions of the sport. If we wanted to exercise indoors, we'd all become gym rats.

Indoor cycling is a last resort when weather makes it impossible to ride outside. But many coaches recommend trainer workouts even if the sun is shining.

"I'm a big fan of indoor trainers," says Chris Carmichael. "Indoor training is a necessity in winter, but I prescribe it to my riders all year round."

The benefits can be great, but there's a big problem: boredom. Watching sweat drip off your nose while hammering against an imaginary opponent in your basement isn't quite as much fun as a spirited training ride in midsummer.

But if you know a few tricks, indoor training is not only bearable but close to enjoyable. Because the trainer makes workouts predictable and repeatable, it's a great workout tool as well.

Indoor Advantages

- **Ride at any hour.** Indoor trainers are great because you can fit in a workout at any time during the day—or night.
- **Defeat bad weather.** Snowy or icy roads can preclude riding outside, but on the trainer you can laugh at the sleet rattling your window.
- **Save time.** Dressing and undressing for an outside ride takes precious minutes. Then you may have to spend more time washing and lubing your bike. But if you're riding a trainer, simply pull on shorts, fill your bottles, switch on the VCR, and afterwards give your bike a quick wipe with a towel.

- **Be safer.** When you ride indoors, there's no treacherous ice or traffic to worry about and you're guaranteed to stay upright, unless you tip over the trainer. Don't laugh—some riders have managed to.
- **Seize control.** Riding a trainer allows you to precisely monitor each workout. That's why coaches love it. Says Chris Carmichael, "It's controllable and predictable so you can duplicate workouts and find out exactly how much you're improving." You determine the time and intensity of every session. Outside, all sorts of things can interfere.
- **Remember how to pedal.** Spinning on a trainer after a crosstraining workout of weights, running, skiing or any other activity helps you retain your pedal stroke. According to Dr. Max Testa: "Pros often use rollers three to five days a week for 20 to 30 minutes if they can't get outside to ride. They'll go to the gym, cross-country ski or skate, then ride the rollers for a cool down."

Tips for Successful Indoor Cycling

Does it sound like I'm trying to talk you into something? Despite all the advantages, I know (like you probably do) that indoor training can be terminally boring.

Time passes at a snail's pace because your mind isn't occupied with everything necessary to keep a two-wheeled vehicle upright and on course. Indoor riding creates sensory deprivation equal to any devised in a psychology experiment. However, with the right approach, time on the trainer can be coaxed to flow along at normal speed. Here are some effective ways.

Limit your riding time. An indoor trainer isn't for off-season endurance workouts. I'll bet most riders try at least once to ride their nowhere bike for three hours while watching football or reading *War and Peace*. They find out that once is more than enough. It's not very effective training, either. Crosstraining is a much better way to get off-season aerobic conditioning.

On the trainer, limit each workout to 60 minutes. Get on, warm up, do your workout, cool down and call it good. A trainer works great for short, intense, structured workouts. It becomes a torture machine for long steady-state rides.

Vary every workout. Never do the same thing on a trainer for more than a few minutes at a time. Shift gears, stand up, pedal with one leg, go hard, go easy—anything to give your body and mind a break.

Keep your mind occupied. On a trainer, your brain doesn't have navigational or bike-handling demands. So all it does is dwell on time and discomfort. Stimulate it with music, movies, TV sports or even, if you're really desperate, quiz shows. I like watching bike races. I tape the Giro, Tour and spring classics to use during the winter.

Stay cool. You'll heat up quickly while riding indoors. The solution is an electric headwind from a large fan positioned a few feet in front of you. The stream of air helps sweat evaporate to reduce your core temperature. The result: Less discomfort and more energy for the work-

out. The cooler your indoor environment, the more work you can do—and the more fitness you can gain.

Drink up. Down at least one big bottle per hour while on the trainer, just like outside during a hot summer ride. Sports drinks work better than water because they replace carbohydrate, extending your energy.

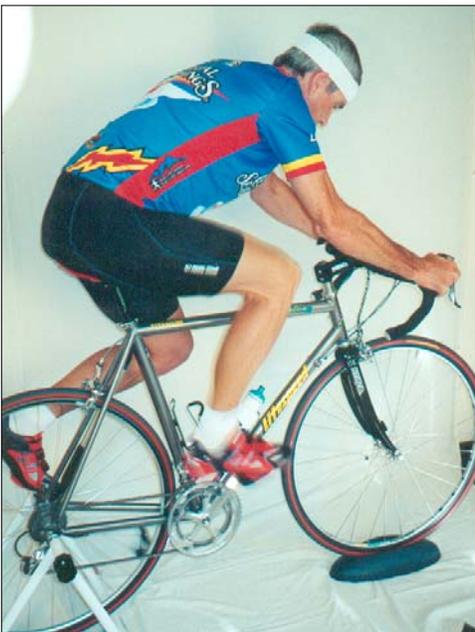
Train with others. Sign up for a spin class at your local health club. These group sweat sessions add variety and social interaction to indoor riding. Some classes include a lot of upper-body gyrations for general fitness. If you're following my off-season program, you don't need that. Look for a class that concentrates on pedaling.

TIP! Have a “trainer night” at your home if you have a large rec room or other suitable space. Invite your friends to bring their bikes and trainers. Plan a workout and the music. Afterwards, take up a collection for pizza delivery.

Workouts like this once or twice a week are great for keeping enthusiasm high all winter. Riders can choose a resistance that gives them the level of intensity they want—and no one gets dropped!

One-Leg Pedaling

One-leg pedaling is an extremely effective way to work on strength, and add variety to your indoor training at the same time.



When you pedal with both legs, the leg that pulls the foot through the bottom of the stroke, up the back and over the top gets lazy. That's because the other leg is pushing the pedal down, a much more powerful and natural action than pulling the pedal up.

Now think about it. If your leg doesn't help bring the pedal up and over the top, it's just dead weight. It increases the resistance your muscles must overcome to move your bike down the road.

Learning to pedal a complete, 360-degree circle with each leg makes you a better rider. One-leg pedaling drills teach your muscles and nervous system. Here's how:

- Warm up on the trainer for 20 minutes while pedaling with both legs.
- Unclip your left foot from the pedal. Hook it back over the trainer just to the left of where it connects to the rear hub. Or, rest it on a chair or stool just outside the left pedal circle.

- Pedal at about 90 rpm using your right leg. Use an easy gear until you get accustomed to the unusual feeling of one-leg pedaling. You'll probably find it difficult to pedal for more than two or three minutes the first time. The muscles that lift your thigh and push the pedal over the top will fatigue quickly. But you'll improve rapidly.
- After a few minutes of using the right leg, switch to the left and pedal for the same amount of time.
- As you improve, increase the gear and the amount of time you pedal with each leg.

Indoor Riding + Weights

You don't need to stay on the trainer for an entire workout.

For example, you can alternate two- to three-minute cycling intervals at about 85 percent of your max heart rate with leg presses, squats or step-ups.

The weight workout improves strength. The pedaling intervals remind your legs and nervous system that you're a cyclist, too. This workout is a great way to create strength and begin the process of converting it to cycling-specific power.

Sample Trainer Workouts

I use a *segmented* approach to indoor cycling workouts.

- Each segment below is a self-contained workout spanning 15 to 20 minutes.
- Segments are designed to accomplish a specific training objective, such as warming up, improving speed or increasing power.
- Segments can be combined to fill the amount of time you want to spend on the workout.
- Segments can be chosen to pinpoint specific skills you want to improve.

Remember that these segments are samples. Each workout suggests several variations—and variety is the key to enjoying (not just surviving) your time on the trainer.

TIP! Gear suggestions are expressed as, for example, 39x19. This means a 39-tooth chainring (a size found on many road bikes) combined with a 19-tooth cog. You don't have to use the gear I list. More important is using whichever gear is easy or hard *for you* in the context of the segment. The right gear will change as your fitness develops during the course of training.

Trainer workouts are limited only by your imagination. In fact, it's possible to train indoors three times per week for several months and never duplicate a workout. Make it your goal never to do the same one twice. Be creative!

Segments: *Warm Up and Cool Down*

Always do these two segments. Warm up to begin a trainer workout and cool down before climbing off.

Most cyclists use the same warm up and cool down each time to simplify the workout. But you can vary the approach as long as you work gradually into and out of higher intensities.

WARM UP (15 minutes). Start in a low gear of about 39x19, depending on the resistance of your trainer. Spin easily at about 70 revolutions per minute (rpm). Monitor by counting each stroke of your right leg for 30 seconds, then multiply by two to get rpm.

Each minute, increase cadence by several rpm. After five minutes, increase the gear. At the end of 15 minutes, you should be sweating lightly and your heart rate should be about 80 percent of max. Finish the warm up with several 10-second sprints in a large gear.

COOL DOWN (10 minutes). When the main workout is complete, decrease cadence and gearing on one-minute intervals until you're spinning an easy gear at about 70 rpm. Then climb off.

Segments: *Leg Speed*

SPIN-UPS (20 minutes)

1. In a low gear (39x19), spin at 70 rpm for 60 seconds.
2. Each minute, increase cadence by 5 rpm. You'll know when cadence gets too fast to sustain for 60 seconds because your butt will bounce on the saddle.
3. When you start bouncing, reduce cadence by 5 rpm every minute to the end of the 20-minute segment.

ONE-LEG SPEED (20 minutes)

1. In a low gear (39x19), spin at 90 rpm for 15 seconds. Then pedal slowly for 45 seconds.
2. Repeat four more times but increase your cadence during the first 15 seconds by 5 rpm each time.
3. Unclip your left foot. In a low gear (39x21), spin with your right leg for 60 seconds at about 100 rpm.

4. Do the same with the left leg.
5. Repeat steps 3 & 4 four times.
6. Using both feet, repeat steps 1 & 2.

STAND AND SPRINT (20 minutes)

1. In a moderate gear (53x19), stand and sprint at about 100 rpm for 15 seconds.
2. Sit and spin the same gear gently for 45 seconds.
3. Repeat steps 1 & 2 four times.
4. In a fairly large gear (53x17), stand and sprint hard for 10 seconds.
5. Sit down, shift to a fairly low gear (39x17) and spin easily for 50 seconds.
6. Repeat steps 4 & 5 nine times.

Segments: *Climbing Power*

TIP! To simulate riding uphill, put a block of wood under the front wheel to tilt the bike. A 4- to 6-inch block will do it.

MINUTE ON, MINUTE OFF (20 minutes)

1. In the saddle using fairly large gear (53x17), pedal at 90 rpm for 60 seconds. This should raise your heart rate to about 5 bpm below your lactate threshold (LT). It should feel “hard.”
2. Shift to the small chainring and spin easily for 60 seconds.
3. Repeat nine times. During the final three efforts, your heart rate will climb to your LT or slightly above as you near the end of 60 seconds.

STAND AND ASCEND (20 minutes)

1. In a big gear (53x13), stand and pedal rhythmically for two minutes. Your heart rate should rise to about 5 bpm below your lactate threshold. It should feel “hard.”
2. Sit down, shift to the small chainring, and spin easily for two minutes.
3. Repeat four times. During the final three efforts, your heart rate will climb to your LT or slightly above as you near the end of the two minutes.

UP AND DOWN (20 minutes)

1. In a moderate gear (53x19), pedal for five minutes at a cadence around 90 rpm.
2. Stand and shift to a cog that's two or three teeth smaller than you were in while sitting. For example, if you pedal seated in 53x19, shift to the 17 or even the 15 when you stand. Intensity should feel "hard." Your heart rate should rise to your LT during the last two minutes of the effort.
3. Sit down, shift to the small chainring, and spin easily for five minutes to recover.
4. Repeat once.

Segments: *Time Trial Power*

TIP! If you have a time trial bike, use it for these workouts so you get accustomed to the position. Or, put clip-on aero bars on your trainer bike.

TT "THREES" (20 minutes)

1. Ride for three minutes at a steady pace. Choose a gear that allows a cadence of 90-100 rpm but does not drive your heart rate past LT. It should feel "hard" but not exhausting.
2. Shift to the small chainring and pedal easily for two minutes.
3. Repeat three times.

TT LADDER (20 minutes)

1. Choose a gear that lets to maintain a cadence of 90-100 rpm and a heart rate not exceeding your LT. It should feel "hard" but not exhausting.
2. Do a "ladder" like this:
 - 1 minute hard, 1 minute easy
 - 2 minutes hard, 2 minutes easy
 - 3 minutes hard, 3 minutes easy
 - 4 minutes hard, 4 minutes easy.

TT "EIGHTS" (20 minutes)

1. Choose a gear that lets you maintain a cadence of 90-100 rpm and a heart rate not exceeding your LT. It should feel "hard" but not exhausting.
2. Ride at time trial cadence and intensity for eight minutes. Check your cyclecomputer to see how far you go. Check your heart monitor to determine average heart rate.
3. Pedal easily for four minutes.

4. Repeat the eight-minute TT and re-check distance and average heart rate. If you cover substantially less distance the second time, or your heart rate is more than five beats higher, it says you did the first effort too hard.

Segments: *Intervals*

INTERVAL LADDER (20 minutes)

1. Choose a gear that allows a cadence of 90-100 rpm for the length of each interval. Intensity should be “very hard” at the end of each work period.
2. Do a “ladder” like this:
 - 2 minutes hard, 2 minutes easy
 - 1:45 hard, 1:45 easy
 - 1:30 hard, 1:30 easy
 - 1:15 hard, 1:15 easy
 - 1:00 hard, 1:00 easy
 - :45 hard, :45 easy
 - :30 hard, :30 easy

INTERVAL “THREES” (18 minutes)

1. Choose a gear that allows a cadence of 90-100 rpm for the length of each interval. Intensity should be “very hard” at the end of each work period.
2. Ride hard for three minutes.
3. Shift to the small chainring and pedal easily for three minutes.
4. Repeat two times.

Chapter 10 **Better Bike-Handling Skills**

The off-season is a great time to increase fitness, so in much of this book I focus on strength and power. But winter is also the best time to become a better bike handler.

Many cyclists never feel totally comfortable on their bikes, especially around other riders, so they don't enjoy the sport to its fullest. After all, it's hard to have fun when you're nervous about falling!

Let's see how you can increase your confidence on the bike with a few simple off-season activities and drills.

Cyclocross

Cyclocross in the fall and winter will significantly hone your bike-handling ability. It will boost your fitness, too. You don't need special equipment and you don't need to race. Merely hammering around a half-mile loop in the local park will do it.

If you're not familiar with cyclocross, the concept is simple. You ride a road bike on a course that's mostly unpaved. There are steep uphill sections and barriers that require hopping off and running while pushing or carrying the bike. It's a combination of riding, running, and bike handling with some weight lifting and agility drills to boot.

That's a combo that's hard to beat. Plus, it might just save your skin.

EXAMPLE! When I was the training & fitness editor for *Bicycling* magazine, the editorial staff gathered in Moab, Utah, for the mountain bike festival held every October. One year, technical editor Jim Langley brought along two cool road bikes to test (a Waterford and a Litespeed).

We wound up riding the La Sal Loop, a 65-mile course into the mountains above Moab that features six miles of steep climbing. The descent's a doozy—half a dozen tight switchbacks spiraling down the valley's headwall. The road is narrow and steep, the pavement frost-buckled and speckled with potholes.

And on this day, it had an additional surprise for us, courtesy of a recent storm that had dumped snow in the high country. The road was dry on the climb, but as we descended I came around a shaded corner and was confronted by a 300-yard stretch of packed snow—with a tight bend in the middle. It looked like a crooked skating rink!

I braked as much as possible while still on dry pavement, yelled a warning to Jim, then rode it out using the cyclocross skills gained in the workouts described below (along with a little luck).

Here's how to make cyclocross drills part of your off-season routine:

Use your beater bike. An old road bike is the best choice for cyclocross. Just add knobby 'cross tires to the beater described in [chapter 4](#). You'll probably need to remove fenders to fit the bigger rubber.

It's helpful if the beater has cantilever brakes for more mud clearance, but this isn't vital. Lower the saddle about 5 mm from your normal position. This makes dismounts easier.

You can ride 'cross in running shoes and platform pedals. But cleated mountain bike shoes and clipless pedals are better. An off-road pedal system gives you more security and control while riding, and it allows you to get off and run well, too.

Find a loop. Scout out a park or vacant lot. You need a half-mile loop that's mostly dirt. The ideal location is about five miles from home so you can warm up on the way there and cool

down as you spin home. The course should include a couple of short, steep hills and several things that force you off the bike. Park benches, parking barriers, low fences or fallen logs work great.

Mix technique with intensity. Hit the 'cross course once or twice a week during November and December. Total about a dozen workouts. For the first three or four, simply ride around the course two to five times, working on the techniques described below. Don't force either the pace or your skill level. Then you should add laps but hold intensity to about 80 percent of max heart rate.

During the last three or four workouts, reduce the number of laps but increase the intensity to about 90 percent of max. As Dr. Max Testa points out, "Work on technique at low intensity, but do it at high intensity, too. That's when technique falls apart."

Come spring, you'll be stronger, faster and much more confident in your bike-handling ability.

Four 'Cross Skills You Need to Know

1. Dismount. As you approach a steep hill or obstacle, judge your speed and distance so you don't get off needlessly soon or so late that you stumble. A little practice will allow you to judge the correct velocity every time.

Place your hands on the brake lever hoods for the best bike control. Unclip your right foot and swing your right leg back and over the rear wheel. Then put your right foot between your left ankle and the frame and step forward. As your right foot hits the ground, click out of the left pedal and begin running.

2. Carry the bike over low obstacles. When you come to a low obstacle, dismount as above but move your right hand from the brake hood to the middle of the top tube. Pick up the bike as you run and carry it like a briefcase as you step over the obstacle.

3. Carry the bike up steep hills. When scrambling up a steep pitch, it's best to carry the bike on your shoulder. As you dismount, place your right hand on the top tube as just described. As you begin the hill, flip the bike to your right shoulder. The top tube should rest near your neck. Steady the bike with your right hand on the right handlebar drop.

4. Remount. Place the bike on the ground with both hands on the brake hoods. You're still on the left side.

Smoothly swing your right leg over the rear wheel and onto the saddle, making initial contact with the inside of your right thigh, not your crotch (ouch!). Spring smoothly off the left foot (don't leap). Then slide to the right until you're on the saddle. Locate the pedals and clip in.

Bike-Handling Drills

Cyclocross teaches you balance and how to stay upright when your tires don't have good traction. These are solo skills. Next, you need to learn to ride with other cyclists in close proximity.

This skill isn't useful only for racing elbow-to-elbow in a mass sprint. Century rides often feature several hundred (or thousand) adrenaline-charged cyclists packed together, especially in the early going. The starts of El Tour de Tucson and the Hotter'n Hell Hundred are good examples. When I rode these big events I was reminded of a land rush in an old western.

Even if you only ride with a few friends, pacelines necessitate getting close. It pays to learn to be comfortable in company. The off-season is a great time to do it.

For these drills, you need a large grassy area. A soccer field is perfect. Don't worry if there's some snow on it. The drills will be even more fun with the extra bike-handling challenge, and if you take a tumble your landing will be softer.

Ride the same bike you use for cyclocross. Wear your usual winter garb and, of course, your helmet. Break out your protective mountain bike or inline skating gear if you have it. Get several Big Gulp-size paper cups that you can stuff up your jacket and carry to the field.

Recruit several similarly equipped friends into joining the fun. Warm up by riding to the field. Combined with the 'cross workouts above, you'll be amazed how quickly these drills improve your bike handling.

Bump and Run. With one other cyclist, ride side by side at walking speed. Keep both hands on the bar. Bump hands and elbows. When you're comfortable with that, lean on your friend shoulder-to-shoulder. Try to push him off his line while you maintain yours. Soon you'll be aggressively bumping and pushing without fear of falling. Head butts are legal!

To make it more fun, start side by side in identical low gears and ride at a cup or water bottle placed 30 yards away. The goal is to be the first to reach the cup, unclip a foot and kick it over. Push your pal with your shoulder, throw a few elbows, lean in to push him off course—anything to keep him from beating you to the cup.

Bottle Pick Up. Put two water bottles on the ground about 30 feet away and five feet apart. Line up with your friend side-by-side. Be in identical low gears. On "Go!" sprint to your respective bottles. While still on your bike, lean down, pick up your bottle, put it in your cage while doing a 180-degree turn, and race back to the starting line. First rider to get there, with his bottle, wins.

Cup Criterium. Set four cups about 80 feet apart to form a square. With several friends, ride around this cup course as if riding a city block criterium. You should all be in the same low gear to keep speed down. Ride side-by-side to get used to bumping when the bike is leaned in turns.

When you're comfortable with a controlled version of this drill, do five-minute races around the cups. Retain the gear restriction. For variety, ride the course the opposite way or arrange the cups in an L shape so you must turn in both directions.

After doing these drills several times, riding in a bunch on the road will feel much less intimidating.

Mountain Biking

When you ride a mountain bike off road, then get back on your road bike, the handling requirements seem so simple. Your confidence is high on smooth pavement after dealing with everything trails throw at you.

If you live in a relatively warm area and trails stay clear in winter, give mountain biking a try. You'll get many of the same bike-handling skills provided by cyclocross.

Too snowy? Not really! Deflate your mountain bike's tires to about 15 psi for maximum traction and flotation. To make icy stretches nearly as safe as dry pavement, install chains or studded tires. Check at a bike shop for these products. The secure traction they provide will amaze you.

Be extra careful in traffic when riding on icy or snow-packed roads. Remember, drivers have less control in slick conditions, too. Steering is hampered and stopping distances are greater.

Part Three

Training Programs

Chapter 11

Three 18-week Programs

Now let's put it all together and set up individual, 18-week off-season training programs for three different cycling interests.

- **Fitness.** Choose this program if you are just getting started in the sport or want to achieve and maintain general cycling fitness. This program is also an excellent maintenance routine at any time of the year. Use it when your life gets too busy to devote much time to cycling but you want to retain good base fitness.
- **Recreation.** This program works well for more experienced cyclists who rode at least 2,000 miles last season and whose goals are centuries, club rides and maybe local club time trials.
- **Competition.** Racers and even nonracers who want to ride fast and athletically should choose this program.

For several important reasons, I don't provide detailed schedules with exact day-to-day workouts. I think you'll agree that doing so would be a mistake, for these reasons:

The principle of individualization. Because any specific schedule would be generic, it almost certainly wouldn't work for you. One size does not fit all when it comes to training. Instead, I list principles to guide you as you set up weekly workouts based on your individual goals, available time and energy for cycling.

Life is never routine. If I say to do an endurance ride on Sunday, some people can't do it because of church, overtime work, family functions, or even because it's a stormy day. It's far better to tell you to schedule one endurance workout each week. Then you can decide the best day for it.

The danger of believing everything you read. If I create a specific schedule, some people will follow it slavishly just because it's in print. I know you wouldn't make this mistake—but in my 24 years of experience writing articles and books about training, I know it happens. There's a great temptation is put on blinders and follow a training plan without regard to its applicability.

Next, I lay out basic principles for each of three six-week cycles. This totals 18 weeks of off-season training. Start in November, December or anytime you can to progressively improve each element of your cycling ability,

I also provide links to chapters or pages that explain particular topics. Click any word you see in a rectangular box for instant transportation (assuming you're reading this on your computer screen rather than on hard copy). Then, with the principles firmly in mind, you can do a great job of creating your personal program.

TIP! Right off the bat, I want to say this: Don't worry if you miss a workout. No schedule should be set in stone. Family or job responsibilities, bad weather or a sudden attack of sloth can keep you from training on any given day. If that happens, simply shrug it off and pick up the program as soon as you can. It's consistency over the long haul that counts, not slavish adherence to each day's workout.

Fitness Riders

Weeks 1-6

Self-Test. At the beginning of week 1, perform a cycling self-test. The results will enable you to chart your improvement over the off-season.

[See chapter 3.](#)

Rest and Recovery. Devote two days each week to rest. No training. It's okay to take an easy walk or use your bike for errands. A third day should be a recovery day with mild aerobic exercise on the bike or crosstraining. Limit a recovery workout to 45 minutes.

[See chapter 1.](#)

Bike Handling. During this six-week period, schedule five bike-handling sessions. They should be separated by at least six days. Start with cyclocross or mountain bike trail riding for the initial four workouts then follow with two sessions of bike-handling drills.

[See chapter 10.](#)

Resistance Training. The goal for this six-week period is to accustom your muscles to weight training. Lift two times per week, once on your recovery day and again on an easy aerobic day. Separate resistance training sessions by at least 48 hours.

[See chapter 6.](#)

Here's the program:

- 1-2 sets of 12-20 reps for each upper-body pushing and pulling exercise you choose.
- 1 set of 15-25 reps for back extensions.
- 1 set of 30-50 reps for crunches.
- 1 set of 15-25 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, either on the bike or crosstraining. Duration should start at 45 minutes and increase to 90 minutes at the end of six weeks. Keep intensity at the “moderate” level—65 to 80 percent of max heart rate.

Other Workouts. Each week, do 1-3 workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. Include stretching after each easy aerobic workout.

See [chapter 8](#).

CAUTION! Don't do any hard aerobic training during this period. Keep effort no greater than “moderate.” If you use a heart monitor, don't exceed 80 percent of your maximum heart rate.

Sample Week (1-6)

- **Monday.** Rest day. No training. It's okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 45-minute aerobic workout followed by resistance training.
- **Wednesday.** 45 minutes of bike-handling drills, cyclocross or mountain biking.
- **Thursday.** Easy 45-minute aerobic workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining to warm up.
- **Saturday.** Rest day.
- **Sunday.** Endurance training with a 60-minute ride or crosstraining.

TIP! Do a stretching routine after each easy aerobic workout. See [chapter 8](#).

Weeks 7-12

Rest and Recovery. Devote two days each week to rest. Don't train. It's okay to take an easy walk or use your bike for errands. A third day should be a recovery day with mild aerobic exercise on the bike or crosstraining. Limit these workouts to 45 minutes.

See [chapter 1](#).

Bike Handling. During this six-week period, schedule five bike-handling sessions. Three should be for cyclocross or mountain biking, and three should be devoted to bike-handling drills. Round up several friends to do these drills with you.

See [chapter 10](#).

Resistance Training. Your goal during this six-week period is to build strength. Lift twice each week, once on your recovery day and again on an easy aerobic day. Separate resistance training sessions by at least 48 hours.

[See chapter 6.](#)

Here's the program:

- 2-3 sets of 8-12 reps for each upper-body pushing and pulling exercise you choose.
- 2 sets of 15-25 reps for back extensions.
- 2 sets of 30-50 reps for crunches.
- 2-3 sets of 12-20 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, either on the bike or crosstraining. Ride if weather permits. Workouts should progress from 90 minutes to about two hours at the end of the six-week period. Keep intensity at the “moderate” level—65 to 80 percent of your max heart rate.

Other Workouts. Each week, do 1-3 workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. Include stretching after each easy aerobic workout.

[See chapter 8.](#)

CAUTION! Don't do any hard aerobic training during this period. Keep your effort “moderate.” If you use a heart monitor, don't exceed 80 percent of your maximum heart rate.

Sample Week (7-12)

- **Monday.** Rest day. No training. It's okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 60-minute aerobic workout followed by resistance training.
- **Wednesday.** 60 minutes of bike-handling drills, mountain biking or cyclocross.
- **Thursday.** Easy 60-minute aerobic workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining to warm up.
- **Saturday.** Rest day.
- **Sunday.** Endurance training with a two-hour ride or crosstraining activity.

Weeks 13-18

Rest and Recovery. Devote two days each week to rest. Don't train. It's okay to take an easy walk or use your bike for errands. A third day should be a recovery day with mild aerobic exercise on a bike or crosstraining. Limit these workouts to 45 minutes to ensure recovery. [See chapter 1.](#)

Bike Handling. During this six-week period, schedule five bike-handling sessions. Phase out cyclocross and emphasize bike-handling drills with friends. [See chapter 10.](#)

Resistance Training. Your goal during this six-week period is to convert leg strength to power. Switch to an easier, maintenance workout for your upper body and core. Emphasize higher-repetition leg work. Lift twice per week, once on your recovery day and again on an easy aerobic day. Separate resistance training sessions by at least 48 hours. [See chapter 6.](#)

Here's the program:

- 1-2 sets of 12-15 reps for each upper-body pushing and pulling exercise you choose.
- 1 set of 15-25 reps for back extensions.
- 1 set of 30-50 reps crunches.
- 1-3 sets of 20-40 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, always on the bike if weather permits. Workouts should be in the range of 2½ hours, depending on your goals and available time. Keep intensity "moderate" —65 to 80 percent of your max heart rate.

Intensity. Now's the time to convert weight-room strength to cycling power. Once a week, ride hills at a steady pace. The effort should feel "hard" but not exhausting. If you use a heart monitor, aim for about 85 percent of your max by the top of the climbs. Alternate sitting and standing. Use gears that allow you to keep cadence around 90 rpm.

Other Workouts. Each week, perform 2-3 workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. Include a stretching routine after each easy aerobic workout. [See chapter 8.](#)

Self-Test. At the end of week 18, perform a cycling self-test exactly like the one you did in week 1. Compare the results. I know you'll be pleased with your progress! [See chapter 3.](#)

Sample Week (13-18)

- **Monday.** Rest day. No training. It's okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 60-minute aerobic workout followed by resistance training.
- **Wednesday.** 60 minutes of bike-handling drills.
- **Thursday.** Easy 60-minute aerobic workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining to warm up.
- **Saturday.** Rest day.
- **Sunday.** Endurance training with a 2½-hour ride or crosstraining activity.

TIP! Although I've labeled this schedule for fitness riders, it makes an excellent conditioning program for anyone.

Let's say you want to peak in July or August for a long tour or race series. It's wise to avoid training too hard in the off-season. You don't want to burn out before your big event.

In this case, the preceding program works great. Use it for your base, then increase your training two or three months before the big event you have circled on your calendar. I tell you how to peak for key events in my other RBR eBook, *Basic Training for Roadies*.

Recreational Riders

Be sure to keep your goals in mind when you design your personal program. For example, if your objective is fast centuries, make your endurance day a longer ride. If you want to hang with the group on two-hour Sunday-morning jam fests, limit endurance rides to three hours and include more intensity.

Weeks 1-6

Self-Test. At the beginning of week 1, perform a cycling self-test. The results will enable you to chart your improvement over the off-season.

[See chapter 1.](#)

Rest and Recovery. Devote two days each week to rest. No training. It's okay to take an easy walk or use your bike for errands. A third day should be a recovery day with mild aerobic exercise on the bike or crosstraining. Limit these workouts to 45 minutes.

See [chapter 1](#).

Bike Handling. Do one bike-handling session each week, separated by at least six days. Cyclocross is a good choice for the initial four sessions because it builds power as well as bike-handling skills. Or, go mountain biking on hilly trails. Devote the remaining two sessions to bike-handling drills.

See [chapter 10](#).

Resistance Training. The goal for this six-week period is to accustom your muscles to weight training. Lift twice a week, once on your recovery day and again on an easy aerobic day. Separate resistance training sessions by at least 48 hours.

See [chapter 6](#).

Here's the program:

- 1-2 sets of 12-20 reps for each upper body pushing and pulling exercise you choose.
- 1 set of 15-25 reps for back extensions.
- 1 set of 30-50 reps for crunches.
- 1-2 sets of 15-25 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, either on the bike or crosstraining. Workouts should start at 60 minutes and increase to at least two hours by the end of the six-week period, depending on your goals and available time. Keep intensity "moderate" —65 to 80 percent of your max heart rate.

Other Workouts. Each week, do 2-3 workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. You may choose to ride a fixed-gear bike for these workouts. See [chapter 7](#). Include stretching after each easy aerobic workout.

See [chapter 8](#).

CAUTION! Don't do any hard aerobic training during this period. Keep your effort "moderate." If you use a heart monitor, don't exceed 80 percent of your maximum heart rate.

Sample Week (1-6)

- **Monday.** Rest day. No training. It's okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 60-minute aerobic workout followed by resistance training.
- **Wednesday.** 60 minutes of bike-handling drills, cyclocross or mountain biking on trails.
- **Thursday.** Easy 60-minute aerobic workout.

- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining to warm up.
- **Saturday.** Rest day.
- **Sunday.** Endurance training with a 1- to 2-hour ride or crosstraining activity.

Weeks 7-12

Self-Test. At the beginning of week 7, perform a cycling self-test. The results (compared to the identical test you took during week 1 and the identical test you'll take in week 18) enable you to measure your improvement over the off-season.

[See chapter 3.](#)

Bike Handling. Do one bike-handling session each week, separated by at least six days. Two sessions should be cyclocross to continue building power. Expand bike-handling practice to include friends for competitive drills.

[See chapter 10.](#)

Resistance Training. Strength building is the goal for this period. Lift 2-3 times per week, once on your recovery day and again on easy aerobic days. Separate resistance training sessions by at least 48 hours.

[See chapter 6.](#)

Here's the program:

- 2-3 sets of 6-10 reps for each upper-body pushing and pulling exercise you choose.
- 2 sets of 15-25 reps for back extensions.
- 2 sets of 30-50 reps for crunches.
- 2-4 sets of 12-20 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, on the bike if weather permits. Otherwise, crosstrain. Workouts should progress to as many as three hours, depending on your goals and available time. Keep intensity "moderate"—65 to about 80 percent of your max heart rate.

Other Workouts. Each week, do two workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. You can use a fixed-gear bike for the first three weeks. [See chapter 7.](#) Include stretching after each easy aerobic workout.

[See chapter 8.](#)

Intensity. Once a week, do one hour of interval training on the bike indoors or out. Do a variety of intervals, but never exceed 90 percent of your maximum heart rate. Emphasize low-cadence, high-resistance pedaling to begin the process of converting weight-room strength to cycling-specific power.

[See chapter 7.](#)

CAUTION! High-resistance pedaling can be hard on your knees. If you experience any knee pain, stop doing these workouts immediately and return to easy, low-resistance spinning until the problem is resolved. If knee pain is often a problem, I recommend getting to the bottom of it with an RBR book I coauthored, *Andy Pruitt's Medical Guide for Cyclists*. In it, Andy tells how to diagnose and treat eight different knee injuries cyclists may experience.

Sample Week (7-12)

- **Monday.** Rest day. No training. It's okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 60-minute aerobic workout followed by resistance training.
- **Wednesday.** 60 minutes of bike-handling drills, cyclocross, or mountain biking on trails.
- **Thursday.** 60- to 75-minute interval workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining to warm up.
- **Saturday.** Easy 60-minute aerobic workout.
- **Sunday.** Endurance training with a 2- to 3-hour ride or crosstraining activity.

TIP! Make week 10 a “rest week.” You’ve been working progressively harder for nine weeks. Now back off and give your body time to consolidate the gains. Cut your total workout time by one-third. In the weight room, reduce the number of sets of each exercise by the same fraction. Reduce intensity, too. You’ll begin week 11 with renewed energy.

Weeks 13-18

Bike Handling. During these final six weeks of off-season training, do one bike-handling session each week, separated by at least six days. By this time you will know whether you need to emphasize cyclocross for power or whether your bike handling needs more work. In the latter case, devote all six sessions to bike-handling drills.

[See chapter 10.](#)

Resistance Training. The objective of this period is to begin converting strength to cycling power. Lift twice per week, once on your recovery day and again on an easy aerobic days. Separate resistance training sessions by at least 48 hours. Reduce your upper-body and core work to a maintenance level. Use the extra energy for harder leg workouts.

[See chapter 6.](#)

Here's the program:

- 1-2 sets of 12-20 reps for each upper-body pushing and pulling exercise you choose.
- 1 set of 15-25 reps for back extensions.
- 1 set of 30-50 reps for crunches.
- 2-3 sets of 25-50 reps for each leg exercise you choose.

CAUTION! Combining high-rep leg work in the weight room with interval sessions on the bike can result in too much intensity. If you lack enthusiasm for this hard work, you may be overdoing it. Reduce weight room leg workouts to one per week.

Endurance Training. Do one long aerobic workout per week, always on the bike if weather permits. Make every effort to get on the road. Rides should progress to as long as four hours, depending on your goals and available time. Keep intensity “moderate”—65 to 80 percent of your max heart rate.

Other Workouts. Each week, do two workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. Include stretching after each easy aerobic workout.

[See chapter 8.](#)

Intensity. Once a week, do a 90-minute interval session on the road or a 60-minute interval session on the trainer. Only rarely exceed 90 percent of your maximum heart rate. Gradually progress from the low-cadence, high-resistance pedaling you did in weeks 7-12. Now you want to do higher-cadence intervals at higher heart rates for added power and acceleration.

Self-Test. At the end of week 18, repeat the cycling self-test you did in weeks 1 and 7. Compare the results to the three tests to get an objective view of your improvement.

[See chapter 3.](#)

TIP! Plan weeks 14 and 18 as “rest weeks” to let your body consolidate the gains you’ve made. As you did in week 10, cut your total workout time by about one-third. In the weight room, reduce the number of sets of each exercise by the same fraction. Reduce intensity on your hard day.

This tapering is especially important in week 18 so you’re rested for your final self-test.

Sample Week (13-18)

- **Monday.** Rest day. No training. It’s okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 60- to 75-minute aerobic workout followed by resistance training.
- **Wednesday.** 60 minutes of bike-handling drills, cyclocross or mountain biking on trails.

- **Thursday.** 60- to 75-minute interval workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining to warm up.
- **Saturday.** Easy 60-minute aerobic workout.
- **Sunday.** Endurance training with a 2- to 4-hour ride.

Competitors

If you want to race next summer, off-season planning becomes more difficult than for fitness or recreational riders.

Your performance is more important, for one thing. Racing demands time, energy and money, so you certainly want positive returns. Committing to competition is likely to mean time away from other parts of your life, too.

It's essential to train smart. Here are several guidelines:

Plan your program to reflect your goals. If you're aiming for criteriums that won't exceed an hour, don't do four-hour endurance rides twice a week. Instead, concentrate on speed. Conversely, if you want to do well in road races, endurance should be a priority.

Know your strengths and weaknesses. If you need climbing power, plan extensive weight room work and include cyclocross early in the off-season. Gradually begin to ride hills fairly soon. If your sprint is weak, work on leg speed on the indoor trainer.

Get personal. Any off-season program I devise for competitive riders can't cover all goals. You need to evaluate my suggestions, then modify them for your unique individual situation. Be flexible. Pay attention to your self-tests. Their results will tell you if your training is working or if it has taken you down a dark alley to stalled progress or excessive fatigue.

Weeks 1-6

Self-Test. At the beginning of week 1, perform a cycling self-test. The results help you evaluate the effectiveness of your off-season program.

[See chapter 3.](#)

Rest and Recovery. Devote one day each week to rest. No training. It's okay to take an easy walk or use your bike for errands. A second day should be a recovery day with mild aerobic exercise on the bike or crosstraining. Limit these workouts to 60 minutes.

[See chapter 1.](#)

Bike Handling. Do one bike-handling session each week, separated by at least six days. Cyclocross is a good choice for the initial four sessions because it builds power as well as bike-handling skills. Or, ride a mountain bike on hilly trails. The remaining two sessions should be devoted to bike-handling drills.

[See chapter 10.](#)

Resistance Training. The goal for these six weeks is to accustom your muscles to weight training. Lift two or three times per week, once on your recovery day and again on easy aerobic days. Separate resistance training sessions by at least 48 hours.

[See chapter 6.](#)

Here's the program:

- 1-2 sets of 12-20 reps for each upper-body pushing and pulling exercise you choose.
- 1 set of 15-25 reps for back extensions.
- 1 set of 30-50 reps for crunches.
- 1 set of 15-25 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, either on the bike or crosstraining. Workouts should start at 90 minutes and increase to at least 2½ hours at the end of the six weeks, depending on your goals and available time. Keep intensity “moderate”—65 to 80 percent of max heart rate.

Other Workouts. Each week, do two or three workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. You can use a fixed-gear bike for these workouts. [See chapter 7.](#) Include stretching after each easy aerobic workout.

[See chapter 8.](#)

Intensity. Don't do any hard aerobic training during the first three weeks of this period. Keep your effort “moderate.” If you use a heart monitor, don't exceed 80 percent of your maximum heart rate. In the last three weeks, gradually increase effort on the bike or indoor trainer by including some 5- to 10-minute time trial efforts at about 85 percent of max heart rate.

[See chapter 7.](#)

TIP! Make week 4 a “rest week.” You've been working progressively harder for three weeks. Back off to give your body a chance to consolidate gains. Cut your total workout time by about one-third. In the weight room, reduce the number of sets for each exercise by the same fraction. Reduce intensity a notch, too. You'll enter week 5 with renewed energy.

Sample Week (1-6)

- **Monday.** Rest day. No training. It's okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 60-minute aerobic workout followed by resistance training.

- **Wednesday.** 60 to 90 minutes of bike-handling drills, cyclocross or mountain biking on trails.
- **Thursday.** Easy 90-minute aerobic workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining.
- **Saturday.** 60 minutes of aerobic riding or crosstraining.
- **Sunday.** Endurance training with 90 minutes to 2½ hours of riding or crosstraining.

Weeks 7-12

Self-Test. At the end of week 10 (a “rest week”), perform a cycling self-test with the same protocol as the one you did to start week 1. Then you may want to modify your program, depending on how the tests compare.

[See chapter 3.](#)

Bike Handling. Do one bike-handling session each week. Each session should be separated by at least six days. Cyclocross is a good choice if you need to build power as well as bike-handling skills. If your power is solid but riding skills aren’t, do bike-handling drills. For at least three sessions, have friends join you in grass criteriums so you get a feel for bumping shoulders and handlebars in a tight pack.

[See chapter 10.](#)

Resistance Training. Strength is the goal for these six weeks. Lift two or three times per week, once on your recovery day and again on easy aerobic days. Separate resistance training sessions by at least 48 hours.

[See chapter 6.](#)

Here’s the program:

- 2-4 sets of 6-10 reps for each upper-body pushing and pulling exercise you choose.
- 2 sets of 15-25 reps for back extensions.
- 2 sets of 30-50 reps crunches.
- 3-5 sets of 12-20 reps for each leg exercise you choose.

Endurance Training. Do one long aerobic workout per week, on the bike if possible. If not, crosstrain. Workouts should start at two hours and increase to four or more by the end of this period (depending on your goals and available time). Keep intensity “moderate”—65 to 80 percent of max heart rate.

Other Workouts. Each week, do two or three workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. You can use a fixed-gear bike for weeks 7-9. [See chapter 7.](#) Include stretching after each easy aerobic workout.

[See chapter 8.](#)

Intensity. Once a week, do intervals on the bike or indoor trainer. [See chapter 7.](#)

TIP! Plan weeks 8 and 12 as “rest weeks.” You’ve worked progressively harder for three-week periods. You need to back off to let your body consolidate gains. Cut your total workout time by about one-third. In the weight room, reduce the number of sets by the same fraction. Reduce intensity a notch, too. You’ll enter each three-week “build” period with renewed energy.

Sample Week (7-12)

- **Monday.** Rest day. No training. It’s okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 75-minute aerobic workout followed by resistance training.
- **Wednesday.** 90 minutes to two hours of bike-handling drills, cyclocross or mountain biking on trails.
- **Thursday.** 90-minute aerobic workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining.
- **Saturday.** 90 minutes of aerobic riding or crosstraining.
- **Sunday.** Endurance training with a 2- to 4-hour ride or crosstraining activity.

Weeks 13-18

Bike Handling. Do one bike-handling session each week, separated by at least six days. Eliminate cyclocross because you’ll be doing intervals on the road or on the trainer to develop power. Instead, devote this session to honing your bike-handling skills. Have friends join you in grass criteriums so you get a feel for bumping shoulders and handlebars in a tight pack. [See chapter 10.](#)

Resistance Training. The goal for these six weeks is converting strength to cycling-specific power. Lift twice each week, once on your recovery day and again on an easy aerobic day. Separate resistance training sessions by at least 48 hours. [See chapter 6.](#)

Here’s the program:

- 1-2 sets of 12-20 reps for each upper-body pushing and pulling exercise you choose.
- 1 set of 15-25 reps for back extensions.
- 1 set of 30-50 reps crunches.
- 1-2 sets of 25-50 reps for each leg exercise you choose. Consult [chapter 7](#) for additional, specific ideas.

CAUTION! Combining high-rep leg work in the weight room with interval sessions on the bike can result in too much intensity. If you lack enthusiasm for this hard work, you may be overdoing it. Reduce weight room leg workouts to one per week.

Endurance Training. Do one long aerobic workout each week, always on the bike unless the weather is abysmal. Rides should reach four hours or more at the end of this period, depending on your goals and available time. Most of each ride should be done at a moderate, steady pace of about 70 to 85 percent of your max heart rate. But also include some hill jams, sprints for city limit signs, and time trial-like efforts to chase down frisky riding companions.

Other Workouts. Each week, do two or three workouts at an easy-to-moderate aerobic pace. These can be outside on the bike, inside on the trainer, or crosstraining. Include stretching after each easy aerobic workout.

[See chapter 8.](#)

Intensity. Once a week, do intervals on the bike or indoor trainer.

[See chapter 7.](#)

TIP! Plan week 16 as a “rest week.” You’ve worked progressively harder, so it’s time to back off and let your body consolidate the gains. Cut your total workout time by about one-third. In the weight room, reduce the number of sets by the same fraction. Reduce intensity a notch, too.

Self-Test. At the end of week 18, perform your cycling self-test. Compare the results to the previous two tests to get an objective view of your off-season improvement.

Sample Week (13-18)

- **Monday.** Rest day. No training. It’s okay to take an easy walk or use your bike for errands.
- **Tuesday.** Easy 75-minute aerobic workout followed by resistance training.
- **Wednesday.** Up to two hours of bike-handling drills.
- **Thursday.** Two-hour interval workout.
- **Friday.** Recovery day. Resistance training after very easy riding or crosstraining.
- **Saturday.** 90 minutes of aerobic riding or crosstraining.
- **Sunday.** Endurance training with a 3- to 4-hour ride.

Afterword: Training Camps

One final thing to consider when planning your off-season training: A spring cycling camp.

Riders on pro teams routinely meet in a warm-weather location in January to put in early-season miles, get to know each other better and plan strategy. Now, recreational riders have discovered spring training camps, too.

The advantages:

Escape winter. After several months of spending as much time dressing for riding as actually riding, you get to be in warm weather again.

Learn from coaches. Most camps combine skill sessions with daily rides. You get to hear experienced coaches and ask questions about everything from riding position to nutrition to peaking for your big events.

Meet other cyclists. Riders from all parts of the U.S. (and other countries) come to training camps to jump-start their seasons. It's a great way to meet people and develop a network of cycling friends. It might pay off with a place to stay when you travel to an event.



Build base miles. A week of cycling in early spring provides a solid mileage foundation for the new season.

Here at RBR, we're partial to the week-long PAC Tour spring training camps organized by Lon Haldeman. They take place in March near Tucson and feature warm weather (well, most of the time), instruction, and a variety of rides on great roads through the desert and mountains. The above shot was snapped during the 2001 camp.

Ed Pavelka and I have coached at Lon's camps since their inception in 1996, so we're a bit biased. But the waiting list for places testifies to their popularity. Sign up early if you're interested. You can get info at www.pactour.com.

CAUTION! I've seen riders let their enthusiasm overcome good judgment at early-season camps. After several months of crosstraining and pedaling indoors, when they finally get on the road with their leg warmers off they pile up a huge mileage week. Sometimes this results in an injury and a forced layoff just when they're eager to begin the season. Most camps offer optional daily distances. All you need is the self-control to resist doing the long loop every day.

Heed the words of Chris Carmichael one final time: “Training camps are great. But there’s a tendency to do too much too soon. Don’t jump from 150 miles a week at home to 600 miles during a camp week. Mileage increases of over 20 percent can cause problems. If you have to ride more miles than you’re accustomed to, do some days extremely easy.”

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- John Marsh

- Fred Matheny