ALL NEW
THE TRIATHLETE’S
TRAINING BIBLE
THE WORLD’S MOST COMPREHENSIVE TRAINING GUIDE
4th EDITION
JOE FRIEL
PRAISE FOR JOE FRIEL AND
THE TRIATHLETE’S TRAINING BIBLE

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“The Triathlete’s Training Bible is a fantastic guide. You can’t go wrong using the advice in this book.”
—SCOTT “THE TERMINATOR” MOLINA, TRIATHLON WORLD CHAMPION

“Joe Friel has spent most of his life in devotion to the understanding and teaching of sport. Joe has managed to focus on the key components to athletic success while weeding out the noise. This book will play a substantial role in helping you take the next step as a triathlete.”
—JUSTIN DAERR, PROFESSIONAL TRIATHLETE

“As a triathlon coach, 2004 Olympian, and former top-ranked triathlete in the world, I’ve used The Triathlete’s Training Bible as one of my key references. Joe Friel’s training books have made the once ‘crazy’ sport of triathlon accessible to the public while also guiding seasoned athletes to their full potential. Joe does the hard work for the beginning triathlete by condensing, prioritizing, and simplifying all the science and practical experience, which he has mastered over decades of coaching.”
—BARB LINDQUIST, 2004 OLYMPIAN

“The Triathlete's Training Bible combines scientific research with the experience of a top endurance coach to provide the best training resource book available.”
—GALE BERNHARDT, 2004 TEAM USA OLYMPIC TRIATHLON HEAD COACH
“The Triathlete's Training Bible can help you train for any distance and is most useful to newbies and self-trained athletes who want traditional training advice.”
—Library Journal

“As an athlete with the unique ability to race multiple Ironman races every season, I have always been trouble for any triathlon coach. To coach myself successfully, I needed a reliable and strong tool. I searched all sources carefully until I found the one—The Triathlete's Training Bible by Joe Friel. Whatever my problem, there is always a solution in this book. This book makes my understanding of training, racing, and recovering more complete with every page.”
—Petr Vabrousek, Professional Triathlete

“The Triathlete's Training Bible is an invaluable tool for every triathlete looking to improve.”
—Clas Björling, Professional Triathlete

“The Triathlete's Training Bible is a 'must read' for both athletes and coaches. . . . It captures the essence of multisport training by outlining both the science and the art of the sport in a detailed, yet practical format. It is one of the most valuable resources I have on my bookshelf.”
—Libby Burrell, Former USA Triathlon National Program Director

“Any author who includes the word ‘bible’ in the title risks comparison to a very high standard. The original was divinely inspired, after all. Those with some tri experience who lack the time or the budget to hire a coach should find this book just what is needed to improve performance. Do I hear a chorus of hallelujahs?”
—Impact Magazine

“Friel has combined scientific and technical information with his considerable experience as an athlete and coach of novices, elite amateurs and professionals, to create this very useful reference for triathletes of all types. It would be very surprising if you did not find something useful in The Triathlete's Training Bible.”
—Triathlon Magazine Canada

“Friel explains the science of training in a language you can understand.”
—AmateurEndurance.com

“What Friel is best at is reverse engineering how top athletes perform and then explaining it to the reader in simple, easy-to-use terms.”
—BreakingMuscle.com
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This is a love story. I fell in love with triathlon at my first race in June 1983. It was a bit shorter than what later would be called the Olympic or standard distance. That day, I swam 1,000 meters in a pool, biked 20 miles, and ran 10 kilometers. It was more fun than running a marathon, which was the type of racing I had done before that life-changing day. In fact, marathons were what led me to triathlon in the first place.

I had frequently been injured as a runner. Whenever an Achilles tendon, a balky knee, an aching hip, or some other overworked body part broke down because I was running too much, I would ride a bike to maintain fitness. That happened all too often. One day, while I was cycling my way through yet another injury, I crashed on a high-speed descent in the Colorado Rockies and ended up with some broken bones in my shoulder. Oh, great. Now what? My doctor told me the best thing I could do for the shoulder after it had healed would be to swim (there was no injury rehab back in those days). I followed his advice, and one day in the pool, it dawned on me that I was now swimming, biking, and running, which sounded a lot like a strange new sport I had heard of—triathlon. So, heck, why not give it a try? I did, and my life changed. I was in love.

Back in the early days of triathlon, athletes came to the sport much as I had come—from another sport. Most of the early triathletes were runners, but a few cyclists and swimmers also crossed over. Now that triathlon is part of the sports mainstream, most participants simply start their athletic careers as triathletes. The sport has also changed in many other ways. In the early days, training for triathlon was haphazard. We tried all sorts of things to see what would produce the best race performances. Because I had a running background, I applied what I knew about running to swimming and biking. Others, with backgrounds in swimming and road cycling (there was no mountain biking yet), applied their original sport’s way of training to the other two. Triathlon in those early days was a melting pot of training ideas. It was an exciting time.

Given my strong interest in sports science, I was fascinated by what I was learning from other triathletes, whose perspective of their new sport was often different from mine. I experimented with various types of workouts in each of the three sports. Sometimes they worked, sometimes they didn’t. I began to develop a personal triathlon training methodology based on what I was learning.

I was also new to coaching in the early 1980s. I owned a running store called Foot of the Rockies in a small town in northern Colorado, and I coached many of my customers on the side—only runners at first. But that changed after I fell in love with triathlon. I was so infatuated with my new sport that I bought the bike shop next to my running store, took down the wall between them, and had what was probably the first triathlon store in the world. (I soon discovered that the world was not ready for a triathlon store in 1984.)
After that change, my store’s customers and coaching clientele began to shift from runners to triathletes, and also cyclists. I was also becoming aware that I enjoyed coaching much more than retailing. So I sold the store in 1987 and got a day job while spending nights and weekends doing what I was passionate about—coaching. It took 6 years before I had enough clients to be able to quit my day job and focus on coaching.

By the mid-1990s, I thought I had figured out how to train for a triathlon. And so I wrote a book about what I had learned in my 15 years in the sport—*The Triathlete’s Training Bible*. I didn’t write it for the reader. I wrote it for myself. I wanted to see if I could clearly explain what I had learned not only from my firsthand experience as a triathlete and coach but also from my other love—sports science.

I didn’t expect the book to be around for very long. Perhaps a few hundred copies would be sold, but I would have put on paper what I had learned. Its only purpose was to help me grow as a coach. As it turned out, though, *The Triathlete’s Training Bible* became the best-selling book ever written on training for triathlon. I learned a lot more in the years that followed, so I revised the book twice as new training concepts came along.

It’s now coming up on two decades since I wrote the original. In the last couple of years, I began to realize that I couldn’t just revise the old book a bit to bring it up to date. Too much had changed in 20 years. The book needed more than a revision. It needed a complete rewrite. So I threw out the entire manuscript and started from scratch. The only thing that remains today is the general layout of the book. If you have an older version, you can compare the tables of contents and see a similarity. But that’s as far as it goes. Everything else in this book is new.

If you seriously studied the original book, you may well find some significant changes and even contradictions in this edition. I’ve rethought everything. Very little is exactly the same as it was 20 years ago. The sport has changed. Sports science has changed. I have changed. This newest book reflects where the sport, the science, and I are now.

And it’s not just “all new”—it’s also improved. I know that sounds like a marketing ploy. But it’s true. As you start reading, I think you’ll see what I mean.

Sometimes people don’t like change. I’ve often been taken to task by someone who has read my blog and realizes that what I say there is different from what I said on the same topic two decades back, when I wrote the first edition of *The Triathlete’s Training Bible*. That’s fine with me; I believe the changes in what you now hold in your hands (or read on your screen) are for the better. If you’ve been following the guidelines from the original book, you’ll be challenged to rethink what you know. That’s a good thing. Change is the cost of improvement.

This book is about high performance. As such, it is not for novices. If you are new to triathlon, I encourage you to read an introductory book, such as another of my books—*Your First Triathlon*. Once you’ve learned firsthand, through your training and racing, what the sport is about, come back to this book. It will help you produce better race results once you start thinking of yourself as a high-performance triathlete.

High-performance training means becoming the best triathlete possible. But that isn’t revealed
only in race results. High performance is more than simply where you finish in your races. It's also an attitude grounded in the belief that you can always get better. I've never coached an athlete who couldn't perform at a higher level. Not one. Each of us has plenty of room for improvement between our current level of performance and our potential.

You are fully capable of racing faster and of achieving higher goals as a triathlete. I have no doubt about it. What I want to teach you in this book is how to go about achieving high-performance racing. You may learn only one thing from this book, but that one thing will make a difference. On the other hand, the book may cause you to rethink your training, racing, and athletic lifestyle completely. I've seen such things happen with athletes I've coached over the years, and it led them to better results.

Obviously, however, I am not going to be there to make daily training decisions for you, as I do with my clients. You're going to be your own coach. If you don't think you're up to that, I strongly suggest that you hire a smart coach and work with him or her on your chosen program. There are thousands of coaches around the world today.

One of the biggest changes in coaching since the early 2000s is the advent of coaching web sites, such as TrainingPeaks (www.trainingpeaks.com). With one of these services, it really doesn't matter where you and your coach live. You can be on opposite sides of the world. If you are in your first 3 years of the sport, however, I strongly suggest that you hire a local coach. Some things, such as learning new skills, are best accomplished in a hands-on coaching relationship. But if you're an advanced triathlete—the athlete for whom this book is intended—there is much less reason to meet face-to-face with your coach.

So what's an “advanced” triathlete? We could probably come up with a long list of defining characteristics. But for now, let's just say that an advanced triathlete is someone who's been in the sport for at least 3 years. That's long enough to understand the sport, one's body, and training quite well.

This book, therefore, is intended for the advanced athlete who strives for high-performance racing. It is divided into six parts. Part I examines both mental and physical fitness. Part II is about the fundamentals of training, with an emphasis on basic concepts and on the most important element of physical training for the advanced, high-performance athlete: intensity. Part III lays the groundwork for purposeful training. This is perhaps the most critical topic for the self-coached athlete. In Part IV, we finally get into preparing to race by looking at the details of how to plan your season and drill, all the way down to planning a workout. I consider this the core of the book. Having a solid plan is essential for high performance. Part V examines what is perhaps the most neglected aspect of training for serious triathletes: balancing stress and rest. Many self-coached triathletes get this wrong and, as a result, never experience anything even close to their potential in the sport. And finally, in Part VI, I introduce topics that are often overlooked by athletes that can have a big impact on their triathlon performance—improving skills, becoming stronger, and effectively using a training diary.

Why do you do triathlons? What got you started? If you are like most in the sport, you
took up triathlon because it looked like fun, or perhaps as a way to get in shape, or maybe for the challenge of competing against others or yourself. Or possibly you came to it as I did, from another sport, such as swimming, cycling, or running, and saw triathlon as a way to break the monotony of single-sport training and try your hand at something different. These are some common reasons I’ve heard from triathletes over the years, and I suppose there are many other possibilities. Whatever your reason, you must remind yourself of it frequently as you read this book.

In the coming chapters, we will take a serious look at what it takes to become a high-performance triathlete. And I do mean serious. You will read about stuff that only coaches usually think about. This book is essentially an advanced course in the philosophy and methodology of training for triathlon. It will get pretty deep at times. You may need to ground yourself occasionally by considering the answer to the question above: Why do you do triathlons? Some of what you will read in this book works best for athletes who are driven to compete at a high level. That may not be your thing. You may be reading this book just to get an idea of what you might do to improve your training a bit. You may not be looking to win your age group, make a national team, or qualify for Ironman® Hawaii. Nevertheless, most triathletes still want to race faster than they’ve done before, even if it only means shaving a few minutes off a personal best at a local race. Whatever your goals, stay grounded throughout your reading by reminding yourself of why you do triathlons.

And be prepared to be the best triathlete you can be. If you absorb the principles in this book, you will find yourself on the path to high-performance training and racing. So let’s get started.

—Joe Friel
Boulder, Colorado
In Part I, you will learn about the underlying foundations of fitness for your mind and your body as we examine the mental and physical components of triathlon training. The basics will ultimately determine how well your training and racing go.

Chapter 1 starts us off by examining what I have found to be the three most important mental skills for success in endurance sports: commitment, confidence, and patience. Taken together, they form what we typically call mental toughness. Mentally tough athletes are hard to beat. They seem always to find a way, even when things are not going right.

In Chapter 2, you’ll read about the most basic elements of physical training for endurance sports. Here, you will learn of the philosophy of training I’ve used with athletes—at all levels of performance—for more than 30 years. We will also examine the three pillars of endurance fitness: aerobic capacity, anaerobic threshold, and economy. All of your workouts are intended to make you more fit in these areas. We will also delve into the technology you may already have and how it can be used to improve your training. And finally, we’ll take a look at what successful training involves.
PHYSICAL FITNESS

IN CHAPTER 1, you read about dreaming big and believing in yourself. That culminates with setting a challenging goal. We’ll come back to goal setting in Chapter 5. It will give a focus to your training and help determine what types of workouts you should do. Even though you may have high aspirations for triathlon, your goal can’t be so great that you must change your entire life for it. After all, you do have a lot going on aside from triathlon. Most of your day is undoubtedly spent focused on stuff other than swimming, biking, and running, such as your family, friends, home, and career. All of these and more have to be balanced along with training.

What does balanced mean? It has to do with your priorities, so only you can answer that question. But I can tell you this: The more challenging your triathlon goal becomes, the more all of the stuff in your life needs to center on it—within reason. For most triathletes, a goal of finishing a sprint-distance triathlon doesn’t require much lifestyle focus to achieve. But qualifying for the Ironman World Championship in Kona, Hawaii, is a huge goal and will demand that nearly everything in your life be aimed at this achievement.

Even a huge goal such as racing in Kona must still be reasonable, however. You aren’t going to abandon your family and quit your job to accomplish it (although I’ve known that to happen). But within obvious boundaries, such a high goal will still test your limits.

In this chapter, we will explore what it will take physically to realize your triathlon goal. I’ll describe a philosophy of training that will make your goal highly achievable. We’ll also examine how to train to get the most out of your workouts and the equipment that will help you pull it off. The starting point for all of this is something you’ve probably pondered many times before: What are you capable of achieving in triathlon?
So far, we’ve explored only the mental determiners of triathlon success, such as commitment, confidence, and mental toughness. The remainder of this book, starting now, is about your physical determiners of success. In this and the next three chapters, we’ll lay the groundwork for understanding how to train. Then we’ll examine the critical topic of your physical limiters in great detail in Chapter 6. They will become a central focus of your training throughout the season as you work toward your goal. Limiters, and how you go about training them, have a lot to do with what you can hope to accomplish.

That brings us back to the key matter at hand—your potential. Setting a reasonable triathlon goal for the season always raises the issue of what you are capable of achieving. When an athlete considers this matter, what is really being asked is, Given my core lifestyle, which isn’t going to change, what is my physical potential for performing at a high level? Am I capable of achieving more than what I’ve done in past seasons? These are tough questions for anyone to answer short of using a crystal ball. Even if you were tested in a sports science lab with the best equipment and the most experienced and scientific minds available, you really couldn’t get a definitive answer. There simply are far too many variables—mental as well as physical—that can’t be measured. But you can probably resolve such questions about yourself better than any scientist. Instead of by gazing into the future with lab testing, the answer can be found by looking backward in time.

If your training routine for the past few years has been physically challenging and highly structured while based on the best sports science methods available, and if you’ve also been fully dedicated to following it without missing workouts, then you likely have little room for improvement. The same goes if you’ve had a smart coach and followed his or her schedule religiously. You’re at or very near your potential. But if your recent training hasn’t been well structured or very scientific, if you’ve missed a lot of workouts, or if the training hasn’t been all that challenging, then you have a lot of potential left to realize.

You likely are somewhere between these two extremes. That means you still have room to grow as a triathlete. Most do. How much room separates you from your top-end potential we simply don’t know with any degree of certainty. We do know for certain, however, that growing toward your potential in the sport will demand the most of you. The two keys that are necessary to do this are mental toughness and training with a purpose. Being purposeful starts with your philosophy of training.

Whether you know it or not, you have a philosophy of training. You just may never have thought about it. But everyone has one. Based on what they do, rather than what they say, the training philosophy of many triathletes is “never enough” or “more is always better.” The sport attracts many type-A overachievers who often take their training to their absolute limits. As a coach, I’ve come across many such athletes who pushed themselves to the point of collapse. They are often tired and sometimes become completely burned out. Overtraining is not a pretty sight. (We’ll return to the topic of overtraining...
in Chapter 10.) Massive amounts of physical exercise are not necessary to achieve high goals. Don’t get me wrong; your training won’t be easy if you follow the guidelines in this book. It will require mental as well as physical toughness. But it can be accomplished without overtraining to the point of breakdown if you simply think the right way about training. This is where a training philosophy can pay off.

I propose a way of thinking about your training that is probably very different and also much more effective when it comes to race performance than what you’ve done in the past. It has to do with training consistently. I know that sounds overly simple. Training consistently doesn’t sound like a big deal. But if you accept and follow the philosophy I’m about to describe here, I can assure you that your triathlon performance will improve if there is still unclaimed potential. If you have room to grow, you will definitely get better by training consistently. I’ve seen it happen many, many times with athletes I’ve coached over the years.

**Consistent Training**

Highly motivated athletes often train too frequently, too long, and too intensely. “Never enough. More is always better.” Such thinking inevitably leads to overtraining, burnout, illness, or injury. Over the last 30 years, I’ve helped many athletes get out of these training ruts they’ve dug for themselves by teaching them to train consistently. What does consistent mean? “Relentless, regular, and resolute” is the best catch phrase for success at the highest level in sport. This comes down to doing the *least* amount of training that still achieves your goal—the least, not the most, training. Doing more than is necessary is just another way of saying “overtraining.” That will ultimately lead to a setback. It’s only a matter of when, not if.

If your race performance is spotty and you are unable to perform at what you believe your potential is at A-priority races, then inconsistent training is possibly the cause. In fact, I’ve found this usually to be the reason for lackluster performance among serious athletes. If you are frequently tired when it’s time to do a long or high-intensity session, then inconsistent training is certainly the cause. If illness, injury, or burnout is common, then you are not training consistently. You must learn to harness and direct your desire to succeed. That’s mental toughness. How can you do that? Being relentless, regular, and resolute starts with something that may seem out of place in training for triathlon—moderation.

Moderation in training means that you seldom explore your physical limits. Athletes often attempt the hardest workouts they can do. Long workouts are much too long, and intensity is often way too high. Most seem to believe that peak fitness comes from pushing their limits several times each week, and rest is viewed as something for sissies. That way of thinking is a sure way to derail your training frequently. Moderation in workout duration and intensity is what you should seek.

Figure 2.1 shows how inconsistent and consistent training look for a real athlete. In the first 22 weeks of the season illustrated in this figure, the athlete had several high-training-load weeks that were the result of workouts that were frequently too intense and too long. As a result, she often experienced extreme fatigue, developed a nagging knee injury, and had a couple of head colds. These were enough to derail her weekly
Sometimes you have to hold back to move ahead.

workout plan repeatedly, resulting in little progress in performance to show for nearly 6 months of training. That’s what zeroes in your training log do. They set you back. When this athlete realized that she wasn’t making progress toward her race goal, she hired a coach. Smart move. For the next 10 weeks, the coach had her doing workouts at a more moderate level of intensity and duration. This resulted in much more consistent training and a marked improvement in her fitness and race performances. Sometimes you have to hold back to move ahead.

The strange thing is, though, that while moderation produces steady improvement, it’s also a moving target. Fortunately, it moves in a good way. As your fitness improves, what a few weeks ago would have been a hard workout becomes moderate. So within the same season, your definition of moderation rises relative to how long and hard your workouts are. You’re becoming more fit and capable of training at a higher level.

The same sort of thing is going on from season to season. If you are training moderately, your capacity to handle a high training load gradually increases over the long term. What was a hard workout last month is a moderate workout this month; what was hard last year is moderate this year. All of this has to do with a critical men-
tal toughness skill you read about in Chapter 1—patience. You must be patient to train consistently.

Consistent training is a result of moderation. Consistent training means that you never miss workouts. Well, hardly ever. Let’s face it: Everyone misses a session now and then. That can’t be avoided. You’ve got a lot of stuff in your life. But frequent zeroes in your training log are a huge problem for high goals. Missing scheduled workouts is often the result of too much: too much intensity, too much duration, too much working out, and too much to do in your life. If you train (and live) moderately, you will be consistent. If you are consistent, you will race faster. It’s not how hard the workouts are. It’s how consistently you train. Consistent trumps difficult every time.

A couple of weeks after I start coaching an athlete, I ask whether the training is harder or easier than it was when the athlete was self-coached. The answer is usually that it’s easier. I almost always have athletes do less than they did before, and guess what happens? They become fitter and faster. I focus attention on their weaknesses that must be improved for success in the next A-priority race.

If you want to improve as an athlete, you must know your race-specific weaknesses, and then you must train moderately and consistently with your focus primarily on them. That is where success starts—not from doing lots and lots of random training. The path to success involves a patient commitment to relentless, regular, and resolute training in moderation.

What Is Moderate Training?
So what is moderate training? First of all, moderate means doing a workout that you know you can complete because you’ve done it recently (or something very close to it). By “close to it,” I mean it’s within about 10 percent of the duration or intensity of a workout you’ve done previously. Avoid big increases in workout difficulty.

Second, a moderate workout is one that you know you can bounce back from quickly in time to do the next scheduled and demanding workout.

Third, if you aren’t fully recovered in 48 hours, then the workout was probably too hard. You weren’t ready for it—yet. You will be, but you have to get there gradually. Patience.

This doesn’t mean you should never do workouts beyond the 10 percent limit. I’ll propose some to you in later chapters, but they will be rare. They will certainly test your limits, but they must be done at just the right times. They aren’t something you will do frequently.

Moderation also involves paying close attention to your body. It can’t be forced to adapt and become more fit on some artificial schedule just because you have a race coming up. Your body has its own natural schedule that you must follow if you are to make progress toward your race goal. The body’s schedule is slow, or at least it seems that way to most athletes. It’s best to do harder-than-usual workouts when your body says it’s time, and that’s not necessarily when you’d like it to be. But your body will always tell you when the time is right. In later chapters, we’ll look at some of those biological “messages” you should watch for when specific workouts are described.

**PURPOSEFUL TRAINING**

After you have given thought to your training philosophy, the next step in becoming good at coaching yourself is establishing a methodology for training. Your workouts must follow a proven
process with structure and purpose if you are to succeed at the highest level. Haphazard sessions may work when your goals are not very challenging, but not when you are focused on high performance. There are four steps I want you to follow in your daily training process to help make your training more purposeful and effective. The steps are illustrated in Figure 2.2.

**Step 1: Clear Goal**

Purposeful training starts with having a clear goal for the season. That defines the principal outcome you are seeking—the reason you train. If the goal is vague, then the entire process of purposeful training collapses. For the goal to be clear, it must meet several criteria. We’re not going to get into those now, but we’ll return to them in Chapter 5. By then, you should be ready to determine your season’s goal exactly.

Every workout should also have a goal. I call the workout goal a *purpose* so that the two types of goals don’t become confused. The workout purpose can be something such as this: Run 20 minutes at zone 3 for muscular endurance. Or this: Ride easy in zone 1 for 1 hour to recover. (We’ll get into specific workout types in Chapter 6.) The purpose doesn’t always have to be hard-core training. On occasion, it could even be something such as riding with friends just to have a good time. After all, fun is probably why you started doing triathlon in the first place.

The primary reason for the workout purpose is to avoid haphazard training. Frequently heading out the door with no idea of what you will do is a sure way to accomplish little and show up at races unprepared. Training without purpose ultimately means poor performance. Before starting any training session, always ask yourself the key question: What is the purpose of this workout?

**Step 2: Expert Instruction**

Your workout purpose should ultimately point at your season’s goal. In fact, your goal is nothing more than the accumulation of daily purposes achieved over the course of several weeks. The purposes should follow a pattern that leads from where you physically are at the start of the season to your goal. This can be rather complex because it involves understanding a lot about sports science (which we will get into in the next chapter). At this point, it helps to have someone who is an expert give you clear directions on what you should do. That person could be a coach or trusted mentor who designs a training plan for you. Most triathletes improve exponentially by having such a person in their corner. At the other extreme, you could simply purchase a training plan online and follow it. Realize, however, that such generic plans are not designed specifically for you but for a rather large category of athletes who have similar characteristics. If those char-
characteristics happen to match yours, then the purchased training plan may be your “expert.”

The expert could even be you, if you’re a knowledgeable student of training. Unfortunately, most athletes aren’t, and they don’t have the time or inclination to study sports science the way coaches do. Self-coached athletes typically make a lot of mistakes; the learning curve for them is quite steep while the goal-progression curve is shallow because of frequent interruptions and setbacks. That’s not to say you can’t be your own coach. You can. I’ve known many good self-coached athletes. This book will give you a lot of guidance in becoming one.

Without some sort of expert instruction, however, your chances for success in achieving your challenging goal are greatly decreased. The expert should have a good understanding of what you want to achieve and then provide instructions for getting there. The type of instructions you need on a daily basis are such things as how long the intervals should be; how to vary the intensities within a workout to develop the various energy systems; how to move to improve skills; when to schedule strength workouts relative to swim, bike, and run sessions; and on and on.

If you’re new to the sport, almost anything you do will bring rapid improvement. But for advanced athletes preparing for high performance, training requires more than simply raising your heart rate and breathing hard during workouts.

Who is the expert you will rely on?

Step 3: Specific Practice

Once you know the workout purpose and supporting details provided by the expert for a given session, everything you do must be specific to them. You must stay focused on doing the workout as planned. An exception is made when you decide to make the session easier because you discover you aren’t ready for it; you need more recovery time, for example, or the timing may not be right for some other reason. Going the other way—making the workout harder than its intended purpose—first requires consulting with the expert who designed it. There could be a good reason for its seemingly low level of difficulty. I tell the athletes I coach that if they feel the need to make the workout easier, they can always make that decision and tell me about it later. But I discourage them from making the session more challenging without talking with me beforehand.

It’s important that you know exactly what is to be accomplished in every workout. If the workout is fairly complex, write it down and take your notes to the pool, road, track, or indoor trainer so you can check from time to time to make sure you’re doing things right.

Perhaps the greatest impairment of purposeful practice comes from other athletes. For most workouts, it’s very difficult to follow the session purpose and details specifically if your training partner wants to do something different. When training with others, it’s a good idea to talk about the purpose of your session for that day. If the other athlete is unwilling to follow it, you are better off training on your own. With the possible exception of swim workouts, triathlon is largely a solo sport anyway. You are generally better off doing bike and run workouts by yourself.

The bottom line is that what you do in any given workout must be specific to the intended purpose of that workout if you are to reap the planned benefits.
Step 4: Immediate Feedback

Without doubt, the most effective way to make progress is to have your coach (the expert) with you throughout your training. That way, you can get immediate feedback from him or her regarding what adjustments need to be made if things are not going as they should. A perfect example of this is refining your swim skills. Having someone on deck to tell you how to adjust your “catch” when it’s done incorrectly will bring about much greater progress than if the coach views a video and tells you a day later. But even a day later is better than never at all. The same goes for doing an interval session. Reviewing workout data immediately after a workout is much more effective than reviewing the data several hours later. Immediate pointers from the coach are vital to your progress. The sooner you get feedback, the better.

It’s unlikely, however, that a coach will be able to attend all of your workouts. The most common exceptions for triathletes are masters swim sessions with a coach on deck or a weekly group track workout led by the coach. These are perfect for getting expert feedback. But usually the coach’s feedback will be delayed. The sooner you can get it, the faster your progress will be. The feedback can be hands-on by the attending coach, or it can come through e-mails or text messages. A weekly telephone call to discuss how training is going is a perfect opportunity to ask questions of the coach to make sure you are achieving the intended purposes of your workouts.

If you are self-coached, you must stay mentally engaged with your body during workouts. If your mind drifts while you are working on swim skills or doing intervals on the track, then it’s the same as if the coach leaves. The self-coached athlete must always be analyzing what is happening. And that continues into the post-workout analysis. Data files from whatever devices you are using should be analyzed as soon as possible following each session. Video recordings of a skills session should also be viewed as soon as possible following the workout, but preferably immediately after the drill is done. The key question you should always be seeking the answer to is, Did I accomplish the purpose of the workout?

When you’ve followed all four steps in the training process for each workout, you’ve come full circle back to step 1 for the next workout. But before finalizing the purpose for the next workout, you need to assess your progress to date relative to your seasonal goal. If you’re coming along as planned, then continue to the next workout. Otherwise, if you’re seeing a trend where things aren’t going as planned, you may need to reconsider your goal and adjust your training strategy appropriately.

Training Technology

Step 4 in purposeful training calls for analysis. Many athletes don’t like doing analysis. That’s understandable because it’s tedious work. This is where having an expert working with you can make a big difference. A coach knows what to look for and can explain it to you. But if you enjoy crunching data after a workout, then you just need to know what to look for.

The first objective is to determine if the workout accomplished its purpose, and secondarily to see how it contributed to your goal. So what are you going to measure and how can you do it? This brings us to training technology, the equipment commonly used for analysis.
There are only three things to measure in your training: frequency, duration, and intensity. In the next chapter, we’ll take an in-depth look at all three. For now, though, we need only to take a brief look at two aspects of your workouts: duration and intensity.

It’s helpful to have some sort of technology to measure the duration and intensity of your workouts. Duration is easy. A clock or stopwatch will do. But measuring workout intensity is quite difficult. This is where advanced technology can help make your workouts more productive, not only in terms of getting the intensity right during the session but also in getting immediate feedback in the form of workout analysis afterward.

The mention of technology often ruffles feathers. There have always been athletes who are adamantly opposed to technology in sports, no matter what it is. When rear derailleurs were invented for bicycles in the early 1900s, there were athletes who refused to use them. When bicycle speedometers came into use in the 1930s, many were opposed to them. When bicycle speedometers came into use in the 1930s, many were opposed to them. When heart rate monitors were introduced in the 1980s, many were opposed by many. All were too “techie” for some. No matter what the technology is, some people will always be opposed. They think of themselves as “purists” who maintain the spirit of competitive sports. They dislike numbers.

And, to be honest, advanced, high-tech equipment is not necessary for everyone. Some experienced athletes are good at sensing how hard they are working. In fact, there are runners who can tell you their running pace to within a handful of seconds based on nothing more than experience and how they feel. They do indeed have a great sense of what they are doing. And if they are self-coached, not having any intensity-measuring technology seldom presents a problem. But if the athlete has a coach or mentor, that person can’t know what happened in the workout. Not having data also means the athlete must accurately remember the sensations of each workout for weeks at a time in order to compare them, gauge progress, and determine how best to train. It’s not very precise, but some can manage it, I’ve found.

However, intensity-measuring equipment will definitely help feel-based athletes analyze, gauge progress, and design future training, even if they never look at the device during a workout or race. Am I improving or not? How am I doing compared with this time last year? Am I getting enough racelike intensity in my training? How could I better pace my race? How did I pace the race the last time I did it? How did I manage the hills and wind? Technology will help you answer such questions by eliminating your reliance on memory and guesswork.

There are three intensity-measuring devices I require the triathletes I coach to have: a heart rate monitor, a speed-and-distance device for running (usually a Global Positioning System, or GPS), and a power meter for the bike. As I write, power-measuring devices have just been developed for runners. If they prove to be accurate and reliable, I will require my athletes to have running power meters, too. The power meter for running has the potential to change training for running the same way the power meter revolutionized cycling.

Why do I require these devices? Because the athlete and I will have much better data with which to make decisions. Not having accurate measurements puts the competitive athlete at quite a disadvantage. If you have a high-performance goal,
you should have the technology to help realize it. Training and racing without these devices greatly limits the athlete’s development.

I understand that triathlon is an expensive sport and that having such devices adds to the cost. But prices are coming down for each of the devices I suggest you get. Sure, you can still buy top-of-the-line technology and spend a small fortune. But even the least expensive of these products are accurate at providing what you most need—a repeatable measurement of how hard you are working. Any money you spend beyond that basic information is for bells and whistles you don’t really need, but perhaps want. If you are on a tight budget, check around with sporting goods shops and clubs for used equipment for sale. Athletes often upgrade to new technology and want to sell their old stuff.

Heart rate monitors, GPS devices, and power meters are not perfect. You need to learn how to use them, and that can take some dedicated study time. This, again, is where working with an expert makes life easier. Of course, it’s also possible to become too focused on device numbers, especially when the equipment is brand-new and you’re still learning how to use it. For example, there is a safety issue. Riding in traffic while focusing intently on the numbers displayed on your power monitoring device is not wise.

There can also be a loss of “feel” for the athlete who becomes overly dedicated to numbers. From what I said above, it may seem that I’m opposed to training and racing based on the sensations you are experiencing in your body, but that is not the case at all. I often have athletes put a piece of tape over the display on their device and train based only on feel. It’s a good way to learn the art of training and racing. If you had a bad race because the battery on your device died, then you haven’t learned the art of endurance sport. This “art” has to do with something called the rating of perceived exertion (RPE). We’ll get into the details of how to use the high-tech equipment in Chapter 4. I will boil down all of the information there on how to use the equipment, as well as on how to use RPE.

The intensity for the workouts in this book is described in terms of RPE (all three sports), pace (swim and run), heart rate (run and bike), and power (bike). A few of the workouts require comparing different measures of intensity, such as heart rate and pace, or heart rate and power. You can do the workouts without one of the devices, but the feedback is greatly lacking without both.

**SUMMARY: PHYSICAL FITNESS**

You should now have the basic components necessary to organize a training program for high-performance triathlon. The starting place is determining your triathlon racing potential by looking back at how you’ve trained in the past. The less structured your training has been and the more inconsistently you’ve trained, the greater your potential for performing at a high level. That can be good news. Of course, to make that happen, we have to assume that going forward you will give greater structure to your exercise program and do your best to complete every workout. For best results, the structure of your program should be based on purposeful training. That starts with having a goal-oriented purpose for every workout, having the workout expertly designed, paying close attention to carrying out the details of the session, and getting
feedback on how it went as soon as possible after
the session is over.

Your ultimate success as a triathlete depends
on incorporating all of these purposeful training
steps and then evaluating how you’re doing on a
frequent (at least weekly, although more often is
even better) schedule.

To get the details of the workout right while
you’re doing it and to get feedback afterward
require measuring both the duration and the
intensity of the session. While duration is easy
to measure, intensity is much more complex and
at least as important as duration—perhaps more
so (we’ll get into this issue in the next chapter).
Intensity is best measured with devices that
keep the workout on track in real time and pro-
vide feedback after it’s over. The most common
intensity-measuring devices are heart rate mon-
itors, GPS devices, and power meters. To truly
perform at the highest level possible, given your
potential, all three of these devices are beneficial
depending on the workout’s sport. Some unique
athletes can get by without them, but they are
rare. Most of us will improve much more rapidly
with such technology. I think you’ll see why in
Part II.
Joe Friel was one of the first triathlon coaches in the United States. He began racing triathlons and training triathletes in 1983. He also launched what is widely considered the first triathlon store in the world in 1984. In 1997, he was a founding member of the USA Triathlon National Coaching Commission and also served as cochairman.

Joe has a master’s degree in exercise science, so his training methods are grounded in the principles of science, and they have been further polished and enhanced by more than 30 years of personal coaching experience. The athletes he has coached range from novices to elite amateurs to professionals to Olympians. He is a frequent presenter at athletic seminars and coaching conferences. Sports federations from various countries often ask him to update their national coaches on current best practices in training. Joe occasionally leads camps for athletes around the world and advises top endurance athletes and coaches in several sports. He also consults with companies in the sports equipment industry.

Joe has written numerous books on training for endurance sports, including his best-selling *Training Bible* books for triathletes, cyclists, and mountain bikers. He is also a frequent contributor to such magazines as *VeloNews, Bicycling, Triathlete*, and *220 Triathlon*.

In 1999, Joe cofounded TrainingPeaks (www.TrainingPeaks.com), today considered the world’s leading provider of training software for endurance athletes.

As a multisport athlete, Joe has competed in hundreds of events, including national and world championships; has been selected as an All-American age-group athlete several times; and is a USA Triathlon (USAT) regional multisport champion. Joe lives and trains in Scottsdale, Arizona, during the winter and in Boulder, Colorado, during the summer.
TRAIN TO WIN WITH JOE FRIEL

FOR NEARLY 20 YEARS, triathletes have turned to Joe Friel’s Training Bible to learn how to train for victory. Now, in this all-new edition, Joe distills the latest discoveries in exercise science, data analysis, daily planning, and skills development to help you create a personal training plan for success. The all-new *Triathlete’s Training Bible* includes:

- **More Personalization**: Greater latitude for planning lets you build your unique needs and preferences into your seasonal training plan.

- **Power- and Pace-Based Training**: Choose from training programs anchored by power or pace to simplify your yearly planning.

- **Proven Training Science**: Tested training concepts are guaranteed to improve your race performance.

- **Improved Data Analysis**: Get the most from your techware with new ways to analyze your data, focus on the right numbers, and understand your results.

- **Swim Skills Development**: Rework your stroke and see immediate results with four basic movements for faster swimming.

- **New Strength Program**: Use these efficient functional strength exercises—expressly designed for time-constrained triathletes—to build lasting swim, bike, and run power.

- **Custom Recovery Plan**: Design your own recovery schedule to lock in fitness gains after challenging training sessions.

- **Workouts**: Expanded swim, bike, run, and combined workouts deliver more options to match your needs.

**JOE FRIEL** is an internationally recognized expert on endurance training with more than 30 years of personal coaching experience. He is the author of the best-selling books *Fast After 50*, *Your First Triathlon*, and *The Cyclist’s Training Bible*. He is a founding member of the USA Triathlon Coaches Association, holds a master’s degree in exercise science, and is the cofounder of TrainingPeaks.