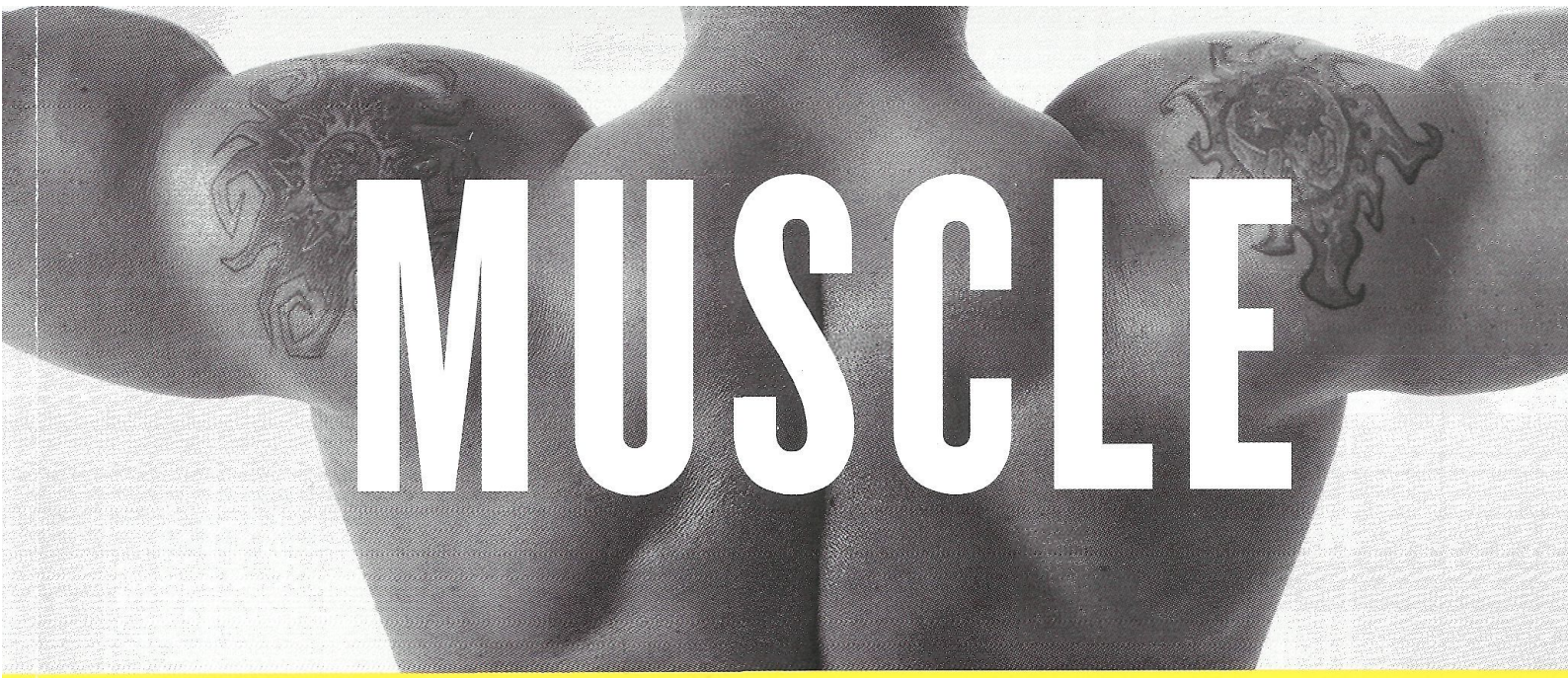

MUSCLE REVOLUTION

THE HIGH-PERFORMANCE SYSTEM
FOR BUILDING A BIGGER, STRONGER, LEANER BODY

CHAD WATERBURY

Acknowledgments

There's no way I could mention every person

who, in some way, helped me along. If I had to list everyone, this book would be twice as long and it's inevitable that I'd still leave someone out. Nevertheless, I want to take this opportunity to specifically thank the following:

God - the most powerful force I know.

My family - for your love and support (especially you, Mom).

My clients - for your commitment to me over the years.

Orbie, Telly and Stacey - my three best friends who always keep me laughing.

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Dr. Gail Koshland - thanks for enhancing my critical-thinking skills.

U.S. Soldiers - I thank you all for your sacrifice to give me the gift of freedom.

Foreword

Let the record show...

On September 12, 2005, I walked into my gym with the goal of seeing how much strength I'd gained during my 12 weeks on Chad Waterbury's Total Strength Program, which is the heart of this book you hold in your hands. I could feel that my 48-year-old body had changed during the previous three months, and had heard a few compliments on my appearance. But I knew the true test of the program was the one I was about to take.

I had done the bench-press routine—which, as you'll see, is one of several versions of the TSP you can choose—with the goal of breaking my own meager records in the lift. I had two in mind: I had bench-pressed 260 pounds for one repetition roughly three years before, and around that time I had knocked out four repetitions with 225 pounds. Both of those records were one-time events; I couldn't remember benching more than 225 pounds in the past three years, and even that was for just one rep.

So those were my targets on that Monday afternoon.

My first hint that this wasn't destined to be a record-setting day came when I managed just three reps with 225. But I hadn't really pushed myself, since I was also shooting for higher numbers on single lifts. I asked one of the gym's trainers to spot me for my next set, a single attempt with 235. I got it easily. Three minutes later, I asked him to spot me again with 245. I got it, although it wasn't easy. It was more than I'd lifted in at least three years, but I didn't think I'd be satisfied unless I made at least one more lift.

So I slid a pair of two-and-a-half-pound plates on the bar, upping the total to 250, and asked the trainer to spot me one more time. I got the bar maybe three inches off my chest, and then shook my head. Not today. The trainer helped me lift the bar back to the uprights, and that was that. I'd worked on this lift for three months, using a program I knew was unique and that I thought would produce unprecedented strength.

Don't get me wrong: I didn't feel bad about my performance that day. I was stronger than I'd been in three years, and I felt great. Experienced lifters know that max-strength programs can leave you feeling as if an insane carpenter has attacked your shoulders and elbows with a nail gun, and after three months on this one, my joints still felt strong and healthy.

But then again, before this workout, my muscles had felt strong, too—stronger than ever, I'd thought. Unfortunately, they weren't. Not on this lift, anyway.

I did a restorative workout on Wednesday, the 14th, focusing on the supporting muscles surrounding my shoulder and hip joints.

On Thursday the 15th, I went back into the gym with the idea that I'd wing it. I'd do all my lifts with dumbbells, and just kind of make up a routine as I went along. I hadn't done any presses—chest or shoulder—with dumbbells in the three months I'd been on Chad's program, and I figured my body could use a change of pace.

I started with chest presses, warming up with sets of 40, 60, and 80 pounds. It felt easy. I knocked out five reps with 90 pounds, still stopping short of truly

pushing myself. Then it hit me: I may have just set a personal record. I flipped through my old training logs (I typically have months' worth piled up on the clipboard I carry around in the gym), and saw that I was mistaken. I'd done a set of six reps with 90 pounds back in April. So I checked to see what my record was with 95. I couldn't find any evidence that I'd lifted it more than two times, so I thought I'd try for three.

To my surprise, I knocked out five. And I still didn't feel as if I'd maxed out.

I looked at the next set of dumbbells on the rack: 100 pounds. I didn't need to consult my training diaries to know I'd never bench-pressed 100-pounders successfully. I could find one record of trying and failing, and suspected that wasn't the only time I'd missed with the triple digits. So now the challenge was clear: If I could do even one rep with 100 pounds in each hand, I could say honestly that I was stronger than I'd ever been in my life, at the age of 48, after 35 years of lifting.

I set the weights between my feet as I stood at the end of the bench, hoisted them to my thighs, sat down on the bench, then lay down as I kicked the dumbbells off my thighs and rested them on the edges of my shoulders. I was flat on my back with 100 pounds of inert iron in each hand. I paused long enough to ensure there was no momentum from any previous movement, pushed, and felt the weights moving up from my shoulders. They kept moving up, all the way to lockout, and a new record. Then I tried another rep, and although I struggled, I managed to complete the lift. I tried a third, got the weights moving an inch or so, but didn't really come close to finishing it.

Still: I had set two new personal records on a lift I hadn't tried in months, on a day when I had walked into the gym with no plan to test myself—no plan at all, in fact.

Since I was still making up the workout as I went along, I decided to knock out some sets of chin-ups and dumbbell shoulder presses, superseding the exercises with little rest in between. Again, I started with no intention to set a personal record. It had been months since I'd attempted any heavy shoulder presses, and in middle age I'd developed a healthy fear of exercises that I thought might put my shoulder joints at risk of injury. I've lost count of the number of trainers I've interviewed over the years who were convinced that overhead presses were the death of a lifter's shoulders. Although I didn't agree with those trainers, I'd had enough shoulder injuries in my youth to make me suspect they were at least partially right.

The first set of shoulder presses, with 40-pound weights, felt easy. So did 50 pounds. I quickly flipped through the pages of my training logs, trying to find some record of my best-ever lifts. I found one set of six reps with 55 pounds, and saw that I'd failed to do a single rep with 60 on the next set.

That seemed about right to me, at least regarding the 60 pounders. (To tell the truth, I was surprised to see I'd done that many reps with 55 pounds. I guess I'm the opposite of most lifters, whom I suspect have a tendency to adjust their memories for inflation, convincing themselves they've lifted heavier loads than they really have.) The idea of setting a third personal record in this workout suddenly seemed realistic.

So, after my final set of chin-ups, I grabbed the 60-pound dumbbells and hoisted them to my shoulders. The first rep went up easily. So did the second, third, and fourth. The fifth was a struggle, so I didn't attempt a sixth.

It wasn't until I put the weights back in the rack that the strangeness of what I'd just done came into focus. How could I knock out five reps with a weight I'd never successfully shoulder-pressed even once? This on a lift I hadn't attempted, according to my records, in the previous five months.

Something different had happened.

What now?

I'd be the first to tell you that a single lifter's success with any given program is predictive of nothing. It doesn't say anything about your chances with that same program. I've managed to write four books about strength training without ever once using my own experience with the programs as a selling point. My feeling was—and still is—that if the program comes from a trainer with the sort of talent and track record that merits inclusion in a book, my own results with the program are irrelevant. That's not to say I take their word for it; I always test-drive programs before I recommend them to readers, and in that sense my reaction has always mattered. If I hadn't gotten bigger, stronger, and/or leaner in the programs designed by Mike Mejia, Ian King, and Alwyn Cosgrove, I wouldn't have included them in *Testosterone Advantage Plan, Home Workout Bible, Book of Muscle,* and *New Rules of Lifting.*

But there's a downside to being my own crash-test dummy. Because I've

done so many programs designed by so many of the world's top trainers, my body has made just about all the adaptations it's going to make. Thanks to what I learned from Mejia, King, Cosgrove and others (including my friend Craig Ballantyne, who designed the program on which I set my personal records in the barbell bench press), I had hit personal bests in all the major lifts throughout my fifth decade of life, even during my fourth decade of lifting. That's while taking ever-greater caution against injuries, maintaining a steady body weight of about 185 pounds, and never being tempted to try a steroid.

Until Chad told me about his program, I figured that I was truly at my limit in terms of muscle mass and pure strength. I didn't fret over my limitations; on the contrary, I saw my maxed-out muscles as a sign that I'd done as much as I could with the time and energy I choose to devote to my favorite recreational pursuit. In fact, the idea of trying to push past my maximums seemed ill-advised at my stage in life. Why not enjoy what I'd accomplished? I knew I could maintain most of my strength and size, since I'd done exactly that for the past several years. I had no desire to put any more weight on my skeleton, and my ego certainly didn't need any gratification. Would I be a better man if I benched or squatted or deadlifted more than I had in years past? Would my wife and kids love me more? Would my books sell any better?

I did, however, want to write a book about strength—that's why Chad and I were in contact with each other in the first place. I was looking for a unique program to build the book around, and was impressed enough with Chad's work that I thought he might be able to provide one. And, of course, I knew I'd try

whatever program I was considering for the book, whether it came from Chad or another trainer. But I don't recall thinking that I'd actually get bigger and stronger in the process. I just hoped I'd find a program that would be fun and challenging.

Instead, Chad showed me a program that made me, against the odds, stronger than I'd ever been.

I was so impressed with the Total Strength Program that I abandoned my own idea for a strength book, and began working with Chad on *Muscle Revolution.* The program was too unique, too innovative, too interesting to squeeze into someone else's book, even if I was that someone else. It needed to be the centerpiece of Chad's first book, surrounded by his other cutting-edge ideas about the best ways to get bigger, stronger, and leaner. And I needed to fade into the background as an editor, rather than putting my own spin on his ideas as an author.

1 think *Muscle Revolution* is as substantive a book as you'll find on the subject of building strength and mass for intermediate to advanced lifters. And I freely admit I'm biased when I say that—biased toward my own work, that is. Oh, I still like my own books just fine. I'll keep writing them, too. But this is one I couldn't have written, and one I'm glad I got the chance to edit.

Once you've tried the Total Strength Program, I think you'll know exactly what I mean.

- Lou Schuler

SECTION 1

Philo and S

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1 The Evolution of Waterbury

Like many of you, my initial

exposure to weight-training was with newsstand muscle magazines. Being a tall, skinny teenager made me hungry for more muscle and strength. After numerous misadventures with programs purportedly "designed" by professional bodybuilders, I found myself with little more muscle and strength than when I started.

Fortunately, I persisted—you wouldn't be reading this book if I hadn't—and started experimenting on my own. I soon discovered that big, compound, multi-joint exercises such as squats, deadlifts, chin-ups, and rows provided the quickest route to strength and size, and they became the mainstays of my programs.

I also realized that the training parameters used by competitive bodybuilders were excessive and haphazard: way too many exercises, way too much total work, way too little scientific justification. So I avoided newsstand muscle magazines as if they were laced with the SARS virus, and sought real-world training knowledge. I wanted something that not only worked for me as a lifter and athlete, but that made sense to me as a student of human performance.

In college, while seeking my first bachelor of science degree in physical science, I was not only exposed to powerlifting, but was lucky enough to get hands-on instruction from three professors who actually competed in the sport. One of my instructors was ranked among the strongest female powerlifters in the world for her age and weight class. My teachers knew powerlifting like Bill Gates

knows computers.

Had I stopped there, I still would've known more about lifting than a lot of trainers and strength coaches. And I think it's safe to say I would've had more knowledge than 99.99 percent of muscle-magazine readers.

But I saw powerlifting as the beginning of my education, not the final destination. As much as I admired the incredible strength built and displayed by the athletes in that sport, and as happy as I was to see my numbers in the squat, bench press, and deadlift go higher and higher, I wanted more.

I wanted to run faster, have less fat than typical powerlifters, and incorporate the Olympic lifts and their many variations in my training. I needed to tap new veins of information to reach those goals.

When I was 19, one of my professors offered me the opportunity to teach a weightlifting class at the local YMCA. The class was intended for regular folks who merely wanted to get in better shape. I was told that most of them had minimal weight-training experience. The experience they did have was based on what you could find in the fitness magazines of that time: three sets of 12 repetitions for every exercise, most of which were performed on machines. The few exercises they knew how to do without machines tended to be single-joint, isolation movements like biceps curls.

Even back then, two years before I was old enough to drink legally in a bar, I knew that they were doing the opposite of what they needed to do to reach their modest goals.

My first day was a profound experience for me and them. As soon as I walked

into the small, crowded weight room and looked at my students, I realized I had taken on a bigger challenge than I'd expected. Not only was the room too small for the size of the class, but the students barely showed any signs of having been trained by my predecessors. You had to look hard to see any difference between them and the majority of the Midwestern town's sedentary, middle-aged population.

Curiously, they also seemed to have little interest in the subject—they wanted to talk about anything but weight lifting.

For the first day, I devised a circuit of multi-joint exercises: deadlifts, squats, overhead presses, rows, bench presses, and pulldowns. My experience with powerlifting had convinced me that they'd get the best results with relatively heavy weights and low reps. I decided on the spot to keep the rest periods short. That was the opposite of what I'd learned to do as a powerlifter, and the only reason for using short rest periods between sets was to keep them from sitting down and talking to each other between exercises.

I demonstrated the exercise techniques and told them to get to it. I'll never forget the bewildered looks I received. Not only were the exercises unfamiliar to them, they couldn't fathom the protocol. "Excuse me, sir," one lady asked. "When can we sit down?" I told her she could sit when the hour-long class was over. It wasn't what she wanted to hear.

Most of the class couldn't make it through the circuit. And it was clear they weren't pleased with this new teacher, this punk college kid, who took away their three sets of 12 reps and wouldn't let them sit and gossip before, after, and

even during their exercises. (That's the beauty of high reps with light weights on exercise machines: You don't have to interrupt your conversation about "who's cheatin' who" to complete the workouts.)

Each subsequent class consisted of variations on the initial exercises, performed with heavier weights, more reps, and/or shorter rest periods between sets and exercises. My goal was to ensure they increased their performance with each and every workout. It seems simple enough, right? But my students couldn't grasp the need to improve. One woman told me she wanted to use the same machine exercises, performing the same sets and reps, because her last trainer had said "that's the best way to train."

Trainers weren't pushing their clients to increase performance? How was this possible? Powerlifting had taught me that greater performance was the entire point. If you're a powerlifter and you aren't regularly, systematically increasing your totals in the three lifts, you have to find another sport. To me, that simple idea should apply to all training—why do it if your goal isn't to get better at it?

I soon realized that few personal trainers learned their trade at powerlifting meets, the way I had.

My students eventually came around to my way of thinking, and it wasn't because of my personal charm. (Although we did get to the point where we genuinely liked each other.) Their middle-aged bodies were actually changing, and in some cases the changes were dramatic. They were building muscle and losing fat faster than even I expected.

I'd devised the combination of high loads, low reps, and short rest periods

out of necessity, but soon realized I'd stumbled onto something big, a fast and powerful way to transform physiques.

And they achieved these results without a single change in their diets. That's right: I never once addressed the topic. You've probably read that diet is several times more important than training for physique transformation. If you don't change the way you eat, the wisdom goes, you can't build muscle or lose weight. I don't disagree with that sentiment, but it doesn't apply here. Without a single diet tip from their instructor, my students saw dramatic changes. If I could go back in time, I'd bring a set of calipers and measure their body fat before and after the class so I could put a number on the amount of fat they lost. But even without a precise way to quantify the results, I was able to show them how much they'd changed.

First, I told them to weigh themselves, but only once a week, upon rising. The scale isn't the best way to measure progress, especially when you consider how weight can fluctuate from day to day. (If you don't believe me, ask your wife or girlfriend.) I figured a weekly weigh-in would give them a general idea that things were moving in the right direction, without the risk that they'd get discouraged from those daily ups and downs.

Second, I told them to dig out a pair of pants or a dress, something they'd worn in their younger, leaner years. One woman had an expensive Chanel dress that she felt she'd never be able to wear again; one guy had recently grown out of his favorite jeans. Everyone in the class had an overly tight article of clothing that came to mind. Clothes don't lie, I told them.

But I didn't merely want to make them leaner; I wanted to make them stronger—much stronger. So I decided to test their five-repetition maximum for the deadlift, squat, bench press, overhead press, and lat pulldown every six weeks. I figured those five exercises would have the most carryover to real-world strength. If the numbers went up, it meant they'd be better able to work in their yards, lift their children, move furniture, or whatever it is they needed their muscles to do.

I recorded the results every six weeks, and found a very consistent pattern:

The women, on average, lost four to five pounds, and one or two dress sizes, while increasing their strength by three to four percent.

The men lost an average of five to six pounds, and one or two inches off their waistlines, while increasing their strength by five to six percent.

That's not their total improvement for the semester. That's what they achieved every six weeks. The men were losing roughly a pound a week and increasing their strength about one percent per week. The women were doing almost as well.

I taught the class for three semesters, a total of 18 months. My goal never changed—I wanted better performance in every workout—and the results were consistent. The students got leaner and stronger by all three standards of measurement.

To me, the key was performance. As long as my students increased their performance week by week, they got the results they wanted.

I couldn't wait to test out my ideas on a different population, and got my

chance when I landed an internship at one of the most prestigious health clubs in Chicago. I suddenly had all the things I did without at the YMCA: more room, better equipment, younger and better-conditioned clients, and colleagues who'd be able to teach me even more sophisticated training techniques. This, I thought, was the big time.

But I was wrong.

The highly paid personal trainers at the club were no more sophisticated than the trainers I'd witnessed at my hometown YMCA. Worse, they thought 1 was the crazy one, a small-town rube who didn't know you weren't supposed to have women do deadlifts. "People who train at health clubs aren't trying to enter the Olympics," the most popular trainer at the club once said to me. "So why are you training them that way?"

It was a long three months. The owner and manager of the health club made it clear to me that their personal-training business was a major profit center for them, and they didn't want me challenging their very lucrative system.

Fortunately, I was stubborn enough to trust my own instincts. I knew that emphasizing performance didn't just make sense in theory, it worked in practice. I figured they would show me the door at the end of my internship no matter what I did, so I trained people the best way I knew how.

At the end of my internship, the head honchos invited me to dinner. I thought, well, this is the end, but at least they're classy enough to buy me dinner after I'd given them three months of free work. I ordered the biggest steak on the menu.

But when the dinner came to a close, the owner said the last words I expected

to hear: "Chad, you've been voted fitness faculty member of the month. We're offering you the position of head trainer at our new extreme fitness facility."

I spent the following year organizing the training system at the new club, along with hiring and supervising a staff of personal trainers. It was a wonderful experience, but after twelve months, I felt it was time to move on. I wanted to continue my education and be my own boss. (The frigid Chicago winters, I confess, hastened my departure.) So I moved to St. Louis and completed more studies, this time in Human Biology. Then I moved further west, to Tucson, where I entered the graduate physiology program at the University of Arizona and launched a strength and conditioning business.

My business allowed me to train clients ranging from elite athletes to corporate executives, and everything in between. It turned out to be more successful than I'd dared to hope. By working with people at every possible level of the fitness spectrum, I was able to devise, test, and improve a vast array of novel training techniques. I learned new ways to improve strength, build muscle, and take off fat, separately or in combination.

But everything I now know, and all that I'm about to share with you in this book, started from that little class I taught at my local YMCA. No matter your goal, you must seek better performance first, and allow the results to follow.

Turn the page, and I'll explain.

Make wisdom your provsion for the journey from youth to old age, for it is a far more certain support than all other possessions.

Bias

2 Performance First

The physiology of the human body

is designed for one purpose: survival through homeostasis. Your body wants and needs to keep things constant. If you drastically cut calories from your diet, your body will slow down your metabolic rate, trying to hang on to as much of its precious energy reserves as it possibly can. Your body does this to keep you from starving to death, which was a valuable survival mechanism for most of human history. Today, for us overfed and overfattened Americans, it's a nuisance that keeps us from seeing our abs.

Your body is going to resist your desire to build bigger muscles, too. Muscle tissue is metabolically costly. It takes a lot of energy—food—to maintain, and screws with your body's preferred balance.

So when you're trying to change your appearance, whether you're trying to get bigger or leaner, homeostasis is your enemy. You have to force your body to change.

That's why you must seek performance first, no matter your goals. If you want bigger muscles, you must first make those muscles stronger. Your body will allow your muscles to grow bigger when you give them a reason. If you lift ever-heavier things, your body has few options other than allowing muscle growth to take place (assuming, of course, you're eating enough food to allow the process to take place).

Fat loss is the opposite side of the same coin. If your body is perfectly happy with the extra fat you've put on over the years, and is perfectly willing to

slow down your metabolism in order to hold onto that fat when you cut calories from your diet, then you have to force the issue. Seek performance from your body, and your body will change to accommodate those new demands. Fat is a burden to a body that needs to run faster and jump higher, as well as fuel for the workouts in which you train your body to reach those goals.

Your body simply doesn't care what it looks like in a mirror. If you take genetics out of the equation, the difference between one physique and another mostly reflects what the two have been trained to do. (As well as how the two bodies have been fed, which is the subject of Chapter 7.)

Getting back to what I discussed in the previous chapter, muscles that have been trained to do three sets of 12 reps of unchallenging exercises will make whatever changes they need to complete the workout. If the workout stays the same, the muscles stay the same. It may even get worse, since the body could find easier ways to complete the workout, using less muscle mass and thus less energy.

Most of us who lift think of "increased performance" as one parameter: how much weight you can add to the bar. Without using heavier weights, how do you gauge progress? Actually, there are lots of ways:

Method #1: Repetition progression

Technique: Add a repetition to each set with the same load as the previous workout.

Goal: Increase the amount of work you do in your workouts, usually with the hope

of building bigger muscles.

Let's say you're doing a three-week program in which you start with five sets of five reps of each exercise. Your progression would look like this:

Repetition Progression			
Workout	1	2	3
Sets	5	5	5
Reps	5	6	7

Method #2: Set progression

Technique: Add a set to each exercise while utilizing the same load as the previous workout.

Goal: Like Method #1, this is a way to increase the volume of your workouts—the total amount of work you perform—in a systematic, progressive way. Again, it's mainly used for hypertrophy.

Here's how it would work, using the same 5 x 5 program:

Set Progression			
Workout	1	2	3
Sets	5	6	7
Reps	5	5	5

Method #3: Rest progression

Technique: Decrease the rest period between each set, while using the same weights from one workout to the next.

Goal: This makes your workouts shorter, which could be a virtue in itself. But it also can be a useful conditioning technique for athletes who have to be able to

go hard for as long as possible—a category that includes martial artists, hockey players, and virtually anyone else whose sport includes a ticking time clock.

Rest Progression			
Workout	1	2	3
Sets	5	5	5
Reps	5	5	5
Rest between sets	75 seconds	70 seconds	65 seconds

Method #4: Speed progression

Technique: Complete each set in less time than the previous workout.

Goal: This is another way to shorten workouts and increase an athlete's ability to maintain a strenuous effort longer. It works bests for strength-speed athletes who rarely have to go for more than a few seconds at a time, such as football, baseball, and tennis players.

Speed Progression			
Workout	1	2	3
Sets	5	5	5
Reps	5	5	5
Duration of sets	8 seconds	7 seconds	6 seconds

I've used all four of these methods with my athletes and other clients, and they all work. Here's how I combine the methods for different goals:

Goal 1: Increase Muscle Mass

Methods: Alternate between rep and set progressions.

Best for: Tough one. Maybe bodybuilders? Just kidding. Actually, anyone who wants more muscle will get the results they want with these two methods.

Goal 2: Increase Muscle Mass and Lose Fat

Methods: Alternate between set and rest progressions

Best for: Anyone who has to wear a swimsuit in the near future.

Goal 3: Increase Strength and Lose Fat

Methods: Alternate between speed and rest progressions

Best for: Athletes, and anyone else, who needs to get leaner while maintaining or even increasing strength and speed.

Goal 4: Increase Strength and Muscle Mass

Methods: Alternate between speed and set progressions

Best for: Athletes involved in power sports who want to reach the next weight class, or who aren't limited to weight classes.

And, of course, you can add weight to the bar

I saved this for last not because it's least important—we all know it's the most reliable way to measure progress, and thus increase performance. If you can perform the same sets and reps with 10 more pounds, you've made

progress. I just wanted to emphasize that it's not the only way, and it can be counterproductive if it's overemphasized.

Even if your workout is well designed and perfectly planned, you can't continually use heavier weights. If it were possible, there'd be no limits to human performance, and 98-year-old men would lift double-wide trailers and win Olympic weightlifting medals.

Physiological limitations aside, there are times when adding weight isn't the best method to boost performance. Constantly higher loads will burn you out eventually, even in a good program. (In a bad program, they'll burn you out in a hurry.) Our nervous and muscular systems aren't good at handling ever-increasing stimuli. Recovery from workouts becomes difficult, and overtraining soon follows.

I like to alternate load-increasing methods with those that increase set-rep volume, or develop some other quality that's useful to the athlete or client I'm training.

Here's how I manage progressions that include heavier weights in a variety of circumstances. In all the situations, just to keep it simple, I'm going to assume the lifter is doing two workouts a week (Monday and Thursday, say) for three weeks.

So let's start where we left off in the previous section:

Goal 4: Increase muscle mass and strength

Week/ workout	1/1	1/2	2/1	2/2	3/1	3/2
Sets	10	5	10	5	10	5
Reps	3	10	4	10	5	10
Load	80% of 1RM*	70% of 1RM	80% of 1RM	72% of 1RM	80% of 1RM	74% of 1RM

* the most weight you can lift once in that exercise

As you can see, Workout 1 uses rep progression (Method #1) to allow you to increase set-rep volume from week to week, which should result in hypertrophy. Then, in Workout 2, you'll boost strength by increasing the load by 2 percent each week. This is as powerful a combination as you'll find to increase muscle mass and strength without risking injury and burnout.

Goal 5: Increase strength with minimal hypertrophy

Yeah, I know, it's a not a problem most of us can relate to. But plenty of competitive athletes have to get stronger and faster without getting bigger, including weight-class athletes, gymnasts, swimmers, and distance athletes, just to name a few. The obvious tactic would be to increase the load in every workout. But that's a formula for quick burnout, especially when you consider that athletes in this category are already training hard for their sport.

So instead, I alternate load and speed progressions (Method #4).

Week/workout	1/1	1/2	2/1	2/2	3/1	3/2
Sets	5	6	5	6	5	6
Reps	3	3	3	3	3	3
Load	84% of 1RM	70% of 1RM	86% of 1RM	70% of 1RM	88% of 1RM	70% of 1RM
Set duration	n/a	4 seconds	n/a	3 seconds	n/a	2 seconds

If your eyes aren't glazing over from staring at the chart, you'll notice a big difference from the previous example: the volume—the total work performed—in each workout is much lower. Higher volume is great for hypertrophy, but it limits gains in pure strength. Since, in this instance, you're trying to limit hypertrophy and maximize strength, you'll do better with less work, but performing the work at a higher intensity. (I'll discuss ideal volume parameters for all five goals in Chapter 3.)

Let me talk for a moment about Method #4: Speed progression. The idea of timing the duration of your strength-speed sets is relatively new. But how do you do it? Ideally, a training partner would time your sets with a stopwatch, and you could keep precise records of your progress.

However, to pull it off you need both a training partner and a stopwatch. If you're an athlete training with a team in an affiliated facility, you should be able to find both. But even then, it's hard to see those perfect, one-second decreases in the time it takes to complete each set each week. More likely, you'll improve by fractions of a second. But that's still progress.

For those who train alone and have some disposable income, I recommend

the Tendo Fitrodyne to monitor progress. This is a microcomputer device with a cable that attaches to the barbell and measures the velocity in meters per second that the barbell is moving. In addition, it also measures peak velocity, average power, and peak power along with some other nifty pieces of power data. It costs about $1,100; for more information, or to purchase, go to www.tendosport.com.

A few words about periodization

In this chapter, I've discussed five methods to improve performance:

1. Rep Progression - add a repetition to each set with the same load as the previous workout.
2. Set Progression - add a set to each exercise while utilizing the same load as the previous workout.
3. Rest Progression - decrease the rest period between each set with the same training load.
4. Speed Progression - complete each set in less time than the previous workout.
5. Load Progression - increase the training load with each subsequent session.

If you take nothing else away from this chapter, I hope you'll remember this point: *Regardless of your training goal or goals, you should employ at least two different progression methods in each week's workouts.*

That point only matters, however, if you use a system of periodization. That is, if you have a plan for how you're going to manage your progression methods going forward. I'll show you plenty of those later in this book, but I also hope that by the time you finish, you'll be able to design your own periodized training system. You may not want to, and that's fine with me: I have confidence that my periodized workouts will work very well for any of the five goals I've mentioned in this chapter. I just hope you'll understand why I designed the programs the way I did, and why I recommend the order of workouts outlined in Chapter 9.

The key to any good periodized system is in the way it anticipates your adaptation to every given set of workouts within the system, and changes the training variables before you have a chance to stagnate with those workouts.

Two types of periodization are worth mentioning here:

Undulating periodization can be described as a constant change in sets, reps, and sometimes load with each subsequent workout. Let's say your next four workouts are based on these set-rep configurations: 3 x 8 (three sets of eight repetitions), 8 x 3 , 4 x 6 , and 6 x 4 . That would be considered an undulating periodization system.

Conjugate periodization was popularized by Russian strength coaches, whose ideas are ubiquitous in modern weight training. It involves training multiple motor abilities (speed, strength, endurance) in the same phase of a workout program. Both undulating and conjugate periodization systems work extremely well. The undulating system has proved great for bodybuilders, while the conjugate system is ideal for power athletes. But it's hard to go wrong with either

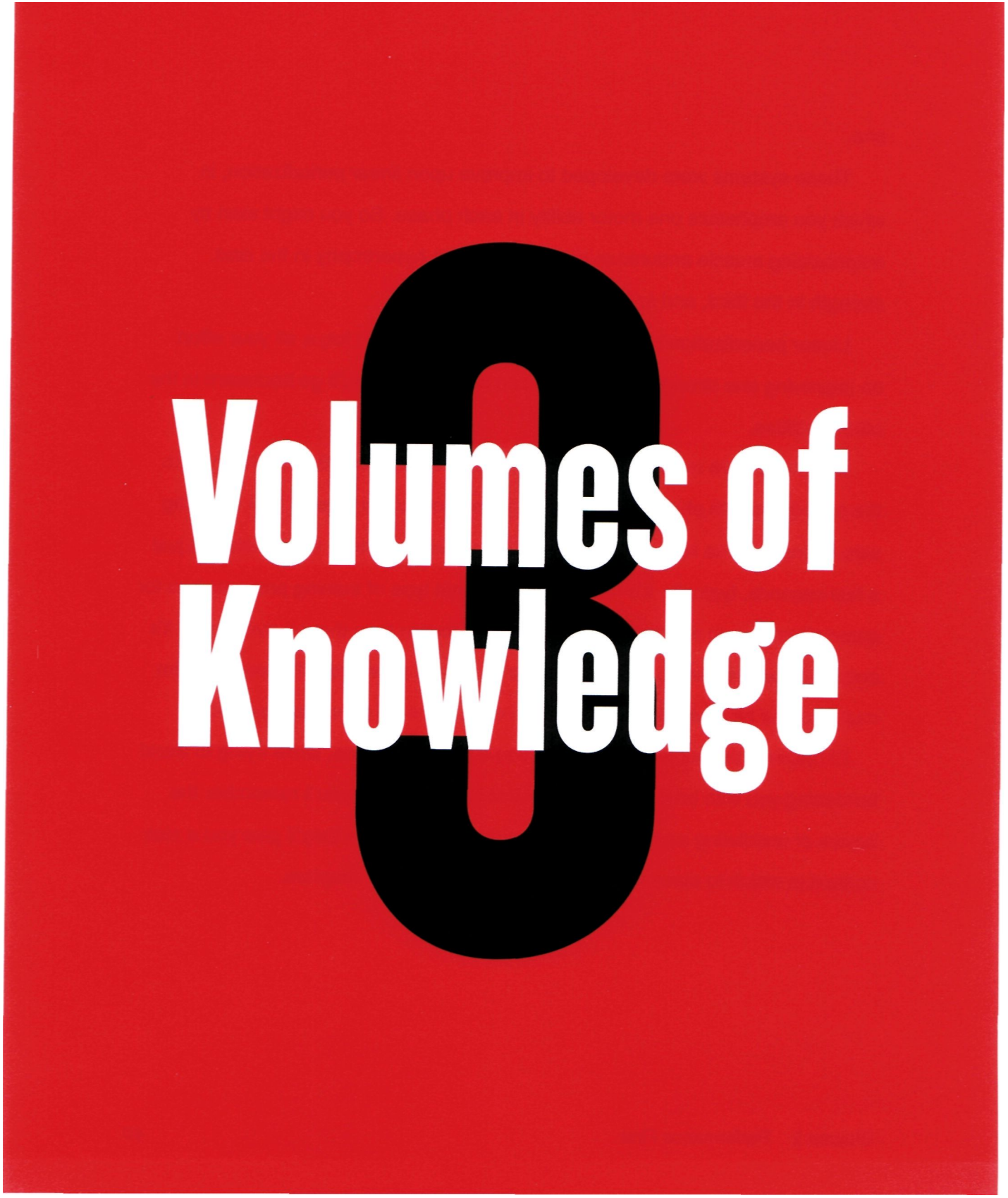
one.

These systems were developed to improve upon *linear* periodization, in which you emphasize one motor ability in each phase. So you might start by emphasizing muscle endurance in the first phase, hypertrophy in the next, strength in the third, and speed-strength in the fourth.

Linear periodization has a major drawback: When you focus all your effort on improving one strength quality, you can be sure that you'll go backward in the other qualities.

Imagine a wide receiver who trains with a linear system. By the time he's in the speed-strength phase, which typically lasts four to six weeks, he'll be doing sets of one to three reps, using near-maximal weights. Since those sets last just a few seconds, typically, it's hard to see how that type of training prepares him for game situations, in which he may be sprinting longer than that on every play. It's certainly useful to him to have greater strength and power, but it doesn't do him much good if he's sacrificed some of the endurance he needs to exploit it.

I'll return to the subject of periodization a few more times, while trying to avoid burdening you with brain-twisting technical jargon. I hope you'll remember the basics of undulating and conjugate periodization, because they'll give you a nice context in which to place the information in the next few chapters.


3
Volumes of
Knowledge

If you listened to the experts,

you'd believe that there are magic formulae for every goal. Want bigger muscles? Do X, Y, and Z. Strength is accomplished by a blend A, B, and C. Fat loss? Everyone knows the secret is M, N, O, and of course P. (Lots of P.)

I'll concede that the conventional wisdom is conventional for a reason. Some training parameters really are more useful than others for specific goals. Sometimes individual trainers and strength coaches have success with methodology that I wouldn't use for the same purpose. And, on rare occasions, people do the opposite of what I'd recommend to reach a goal, and it works anyway, either because of hard work or an individual's genetics or some secret sauce the rest of us haven't yet discovered. (Never mind that the "secret sauce" often turns out to be injectable.)

I can live with all those variables, and I can certainly learn from the times when someone else's recommendations seem to work even though theory and experience suggest they shouldn't. What I have the most trouble accepting are the recommendations that are just pulled out of thin air.

Two variables seem to fuel the most disagreement and misinformation: volume and intensity. You can't be an effective trainer, coach, or athlete until you understand what they are and how their use (or abuse) can set you up for success or failure.

Volume Method: More or Less

I define *volume* as the load lifted, multiplied by the total number of repetitions. So if you did a set of five bench press repetitions with 225 pounds, the volume for that set would be 1,125 pounds. If you did four sets with that weight and those reps, your volume would be 225 x 20 (225 pounds times 20 reps), which is 4,500 pounds.

Intensity is the percentage of your one-repetition maximum—the most weight you can lift once on any given exercise. (To save keystrokes, I'm going to use "1RM" or "one-rep max" interchangeably throughout the book.) Let's say your 1RM for the bench press is 280 pounds. In the sample above, when you did five reps with 225 pounds, you were using 80 percent of your one-rep max.

No matter your training goal, you have to figure out the optimal balance between volume and intensity. You can't separate the two, no matter what anyone tells you.

Practical example: Let's say your program calls for four sets of five repetitions of an exercise, but it doesn't mention intensity. Logic tells you that you'll get a very different effect using 80 percent of your 1 RM than you would using 65 percent. Either prescription is potentially useful, but your training goal determines which is best.

Over the years, as I've put in my time in the gym as well as the lab, I've figured out that for each goal there are minimum and maximum volumes. That is, most lifters will get the results they want if they do a volume of work in between

the minimum and maximum. If they do less, they'll generally undershoot their goals because they aren't giving their muscles enough stimulation. If they do more, most often the results will include overtraining—too much work and not enough recovery.

I call this the Volume Method. The idea is that there's a key volume range for each goal and each phase of training. Those who're genetically gifted or pharmaceuticaliy assisted can certainly get away with exceeding the range, but most natural lifters, in my experience, do best within the ranges I suggest.

When you apply the Volume Method, you'll be able to:

1. Determine which volume range is ideal for your goals.
2. Figure out why a certain program isn't inducing the intended effect.
3. Master the variables you need to create programs for yourself and others.

Now let's look at how the Volume Method applies to the training goals I described in Chapter 2. For the sake of simplicity, I combined the two fat-loss goals into one category.

Goal 1: Increase Muscle Mass

Sometimes we just want to get big and we don't give a damn how strong we are. And sometimes we want to get strong but realize we need bigger muscles to accomplish the task, since a greater number of contractile proteins—the tiny bits of muscle tissue that make the fibers move—will allow the muscles to generate

greater force.

The problem with applying the Volume Method to the goal of maximum hypertrophy is that you'll find people claiming every conceivable system works—low volume, high volume, and everything in between. Some trainees merely perform one set to failure for any given exercise. If that set is 12 reps, then their set-rep volume for that exercise is 12. At the other extreme you find guys who'll try to do 10 sets of 10 reps of a single exercise. As any second grader could tell you, 10 times 10 works out to a set-rep total of 100.

In the first case, one all-out set of 12 reps, you're using between two-thirds and three-fourths of your 1RM. Let's split the difference and say you're using 70 percent of your one-rep max. You can certainly build muscles at that intensity, but in my experience you need a lot more than 12 reps to do it.

In the second case, the most you'll be able to use for 100 reps is about 60 percent of your 1 RM. Put another way, you're not using 40 percent of your 1 RM, which means you're not using your body's biggest and highest-threshold muscle fibers. You're working the hell out of your smaller fibers, and while they have some growth potential, it's nothing like the growth you'll get when you throw the big boys into the mix.

Think of it like a basketball game: Let's say you're a coach with a mix of big men who can rebound and score inside, and smaller guys who can run fast breaks and shoot the lights out from three-point range. If you just play the big men, you'll get murdered in the open court. If you just play the runners and shooters, you'll get demolished in the paint. You need both types of players

to win, just as you need to employ all your muscle fibers to grow the biggest possible muscles.

My prescription:

Table 1

The Volume Method as it Applies to Hypertrophy				
Training Goal	Set-Rep Volume	Movement Loading	Rest Between Sets	Sessions per Week per Muscle Group
Hypertrophy	36-50	70-80% 1RM	60-120s	2-4

The only trick here is to match up volume and intensity at the extremes. If you're using weights that average out to about 80 percent of your 1 RM, doing sets of four to six reps, you'll do best at the low end in terms of volume (six sets of six, say). Conversely, if you're using lighter weights, averaging about 70 percent of 1 RM with sets of eight to 12 reps, you want to go up to about 50 reps per exercise (five sets of 10).

Doing more work with heavy weights will compromise your ability to recover between workouts, and doing less volume with lighter weights will leave your muscles understimulated.

You'll notice that I also included ranges for rest periods and workouts per week for that exercise or movement pattern. With higher volume and lower intensity, you need less rest between sets, and can benefit from more frequent workouts. Obviously, the opposite is true for lower volume and heavier weights: more rest between sets, fewer workouts per week.

Goals 2 and 3: Maintain or Increase Muscle Mass and Strength while Losing Fat

To most experts, the volume prescription for fat loss is pretty simple: "Whatever you're doing now, do more." I'd guess that almost everyone who works out believes this to be true. At best, though, it's a prescription for indiscriminate weight loss—you'll drop muscle along with fat, and maybe even lose an internal organ or two.

I assume no one reading this book wants to give up any hard-earned muscle mass, so I'll take the blanket recommendation to "do more" off the table. Too much volume leads to excessive muscle soreness (a sign of structural damage) and/or a drop in your motivation to exercise (a sign of central nervous system fatigue). You'll need more time to recover, which will compromise your effort by decreasing the amount of exercise you can do. And even if you keep going with the same amount of exercise, you won't be able to do it as effectively.

Another issue: Just as experts always recommend more exercise for fat loss, they tell you to cut calories. ("Whatever you're eating now, eat less.") The goal of calorie-cutting is to create an energy deficit, which is a type of stress. Exercise is also a type of stress, which compounds the stress you've already imposed with the energy deficit. You don't need me to tell you that every body has a limited tolerance for stress, which is why it's so important to modify your exercise volume when you're trying to lose fat.

Here's my solution:

Table 2

The Volume Method as it Applies to Fat Loss				
Training Goal	Set-Rep Volume	Movement Loading	Rest Between Sets	Sessions per Week per Muscle Group
Fat Loss	24-36	70-80% 1RM	30-70s	2-3

One difference you'll note from Table 1: shorter rest periods. Less recovery between sets makes the workouts more challenging, meaning you burn more calories while doing them and also burn more afterwards, since your metabolism runs at a higher speed for hours after you leave the gym. In addition, the lactate you generate when you use shorter rest periods is thought to help you burn more fat.

Goal 4: Increase Strength and Muscle Mass

I define "increase strength" narrowly here, as an improvement in your 1RM for a given exercise. In my experience, any training load greater than 80 percent of your 1 RM will help you achieve that goal. (I know that's not a universally held assumption; many say that the training load needs to be heavier, at least 85 or 90 percent of 1RM.)

Traditionally, exercise scientists and strength coaches have believed that the type of training that increases 1RM strength—near-maximum weights, low-rep sets—won't produce hypertrophy. I don't think it's true, although many fitness professionals still believe low reps don't build bigger muscles. The pendulum seems to be swinging more towards my point of view, which I believe is more

logical. But it's interesting to think of why so many believed it for long. **The** answer, I think, goes back to the old linear-periodization model that I discussed in Chapter 2. When athletes got to the "strength and power" phase of their periodized programs, they dramatically reduced the volume of their workouts. Thus, while they were lifting heavy enough weights to produce hypertrophy, they weren't lifting them often enough to create that effect.

But let's say we go the opposite direction, and keep volume fairly high while using heavier weights:

Table 3

The Volume Method as it Applies to Maximal Strength with Hypertrophy				
Training Goal	Set-Rep Volume	Movement Loading	Rest Between Sets	Sessions per Week per Muscle Group
Maximal Strength w/Hypertrophy	24-36	80-90% 1RM	70-180s	2-4

You'll notice that the set-rep volume per exercise is still less than I recommend for pure hypertrophy, equaling what I advocate for fat loss. But it's more than most would recommend for building strength. Typically, you'll see workouts recommending three to five sets of three reps, a set-rep volume between nine and 15. Even with heavier weights than I recommend (95 percent of 1RM, say), that isn't enough volume to create a hypertrophy stimulus; your muscles aren't taxed to the point where your body adds contractile proteins to help the muscles adapt to the stress.

On the other hand, if you go from 3 x 3 (three sets of three reps) to 8 x 3, you'll do enough work to trigger growth.

As before, the heaviest recommended weights in Table 3 should be matched with the fewest reps and longest rest period. Trust me: If you're doing 8 x 3 with 90 percent of your 1RM, you'll need all three minutes between sets, and 24 reps will feel like 50. At the high end, 9 x 4 with 80 percent of your 1RM and 70 seconds between sets is similarly ass-kicking—as are 10 x 3, 8 x 4, 6 x 5 ...

Goal 5: Increase Strength with Minimal Hypertrophy

If you're an athlete who needs a high level of relative strength—that is, maximal strength in relation to body weight—additional muscle mass can be a hindrance. So for this goal you want to reduce the set-rep volume significantly, especially if you're also cutting or barely maintaining your calorie intake to stay within your weight class.

Here are the parameters you should follow:

Table 4

The Volume Method as it Applies to Maximal Strength Without Hypertrophy				
Training Goal	Set-Rep Volume	Movement Loading	Rest Between Sets	Sessions per Week per Muscle Group
Maximal Strength w/o Hypertrophy	9-15	85-95% 1 RM	90-270S	2-4

In order to minimize hypertrophy, you keep the volume low and take longer rest periods between sets, while using enough weight to improve maximal strength. You'll recruit the maximum number of muscle fibers per lift, and rest long enough between sets to allow your central nervous system to recover. (Your CNS gets fatigued, just like muscles do, and needs time to recover.)

So... What Do I Do?

You'll notice I've given you a bunch of parameters without any specifics about how to use them. So let's pick a practical example. Your goal is #4, strength with hypertrophy. (My favorite, as you may have guessed by now.)

But before I talk about how to employ specific exercises, let me say a word about terminology:

If you consider yourself a bodybuilder, you probably think about the exercises you do in terms of which body parts they work. So you do bench presses for your chest, overhead presses for your shoulders, rows and pulldowns for your back, squats for your legs, etc.

Others like to talk about exercises in terms of movement patterns—a shoulder press is a "vertical push," and a row is a "horizontal pull." This is a more useful way to look at exercises, since it's easy to figure out that the opposite of a horizontal push (bench press) is a horizontal pull (row), and that these combinations should be done in equal volume. This is called antagonist pairing, a

concept I'll discuss in detail in Chapter 4.

But whatever terminology you use, the Volume Method works the exact same way.

Exercise selection

As you've probably guessed, there's a wide range of exercises that you can plug into my formulae. Let's say your goal is maximal strength and muscle size. Looking at Table 3, you see that you should do 24 to 36 reps per muscle group/ movement pattern per workout, at 80 to 90 percent of your 1 RM. Just to make it simple, let's start with the entry-level parameters—24 reps at 80 percent of your 1 RM. Here's how your first workout of the week might look for a typical pair of exercises:

Monday:

Barbell decline bench press: 8x3 with 80% of 1RM

Barbell bent-over row: 8x3 with 80% of 1RM

But maybe you don't want to use just one exercise for each movement pattern, so you decide to do it like this:

Monday:

Barbell decline bench press: 4x3 with 80-82% of 1 RM

Dumbbell flat bench press: 4x3 with 80-82% of 1 RM

Barbell bent-over row: 4x3 with 80-82% of 1RM

Chest-supported row: 4x3 with 80-82% of 1 RM

That might be a more interesting workout, and you'd probably find that using two exercises per movement pattern allows you to train with slightly heavier loads, since you're doing four sets of each exercise instead of eight.

With either choice, you're using the same parameters.

Volume progression

Finally, here's how to use the Volume Method to get the results you want.

Let's assume the same goal—maximal strength with hypertrophy. Once again, you'll start at the lowest end of the spectrum numbers: 24 reps per body part/ movement pattern, 80 percent of 1 RM, two workouts a week. If you add two reps per body part per week, your progression would look like this:

Week	Reps per body part/ Movement pattern	% of 1RM	Workouts per Week
1	24	80	2
2	26	80	2
3	28	80	2
4	30	80	2
5	32	80	2
6	34	80	2
7	36	80	2

From there, you could drop the set-rep volume back down to 24, and add another session per week, so you're doing three instead of two. Follow the same set-rep progression until you hit 36 reps per movement pattern per workout.

Now drop the set-rep volume back down to 24, and add one more workout, so you're doing four a week. Continue with the progression until you're doing 36 reps per body part per workout. At this point, 21 weeks into your program, you've more than doubled your total weekly exercise volume.

Stay with four workouts a week for that movement pattern, but drop back down to 24 reps per workout, and increase the load to 82 percent of your 1RM. Work back up to 36 reps in the next seven weeks.

When you hit that mark, drop back down to 24 reps and bump the weight to 84 percent of your 1 RM. Now build your reps over the next seven weeks.

You can see how this can go on for ages. In just a few paragraphs, I've shown you 35 weeks' worth of progression.

I wouldn't recommend staying on one program for that long, even if you are able to handle each progression. The more experienced you are, the faster you'll get stale and need some kind of change. But I think it's useful to show how you can use the Volume Method to make progress on any program, whether it's one you design or something you found in a magazine or online.

Once you've mastered it, every program and training technique in the universe is yours to exploit.


4
Movements
For Success

By now, if I've succeeded in explaining

what I consider the most important principles involved in strength training, you know a lot more about the subject than you did before opening the book. My guess is that your training IQ is considerably higher. Before we raise it even more, let's have some fun with what you've already absorbed. I want you to stop for a moment and think about the people you see in your gym on a regular basis. (If you work out at home ... well, think about the people who're the reason you don't go to a gym.) imagine them going through their routines. What do you see?

Some people, usually women, are using weights that are far too light to accomplish anything useful. Some, usually guys, are working the same small muscles over and over again with redundant movements. And just about everyone, if your gym is anything like the ones I've used, is sitting down while using these light weights and performing these redundant exercises.

The first failure, then, is in the way they selected their exercise parameters. Whether the problem is load (too little) or set-rep volume (too much for single body parts or movement patterns), they made poor choices. Then, most likely, they compounded the poor choices by adhering to those parameters for months on end, if not years.

The second failure is one we haven't discussed yet: exercise selection.

Why, in a universe of choices, do most trainees gravitate toward the movements that use the least muscle, and use it in a way that's least conducive to building functional strength?

Easy question, I know. We're all a little lazy by nature. Just like the flow of water, most of us search for the path of least resistance. It sometimes makes sense to go the easy route, which is why we don't try to sleep standing up. But in the gym, the path of least resistance is the path of least improvement. It shouldn't take anyone long to figure this out, but for a variety of reasons, most men and women in gyms today never get the idea.

Here's a rule that's almost universally true: The more effort an exercise requires to perform, the more beneficial it is for developing your physique.

Squats are tough. Deadlifts are tough, too. So is any movement that challenges your entire body during each repetition. That's why most people who seek bigger muscles would rather play around with the leg-extension and leg-curl machines than squat with a barbell on their shoulders, or lift something heavy up off the floor. Given a choice between pitting their bodies against raw weights or letting a machine do most of the work, most choose technology over effort. And they have the physiques to prove it.

No one would argue that leg extensions are more beneficial than barbell squats for developing the quadriceps muscles, just as no one would claim that kickbacks build more muscle in the triceps than dips or close-grip bench presses.

Now ask yourself why squats and dips build more muscle than leg extensions and triceps kickbacks. Certainly, they're different categories of exercises. Extensions and kickbacks are "single-joint" exercises, meaning that all the work involves muscles acting upon the knees and elbows, while squats and dips are multi-joint: Squats work more than two hundred individual muscles because

they require action at the body's two biggest joints—hips and knees—while also inducing movement at the ankles and requiring a tremendous effort to prevent movement in the spinal joints. The dip isn't as complex a movement, but it still includes action at the shoulders and elbows, and stabilization of the wrists and all the joints in the lower back.

But there's a simpler answer, and one that applies to most exercises, single- or multi-joint:

Squats and dips allow heavier loading than extensions and kickbacks.

This may seem too obvious when you're comparing squats and leg extensions. (And it doesn't apply to a comparison of squats and leg presses, as I'll explain later in the chapter. You might see guys in your local Gold's who can leg-press 1,000 pounds but would struggle to knock out a set of five squats with 225.) But let's say you compare apples to apples, and evaluate one single-joint exercise against another. How about lying dumbbell triceps extensions vs. dumbbell kickbacks? A guy who could use 35-pound dumbbells on the lying extensions would probably struggle to use even 20 pounds on the kickbacks with good form. So which do you think is the more beneficial exercise?

Now compare two different ways of doing biceps curls: standing with a barbell vs. sitting with dumbbells. Let's say you would use 95 pounds with the barbell (the bar with a 25-pound plate on each side), and 30- or 35-pound dumbbells. Which do you think would be the better muscle-builder, and better for overall strength development?

I don't want to insult your intelligence and pretend this is an all-or-nothing

rule, and that the weight you can use is the only important criterion when you're selecting an exercise. (I'll get into the caveats and nuances later in the chapter.) But I will say this: Loading is the *simplest* way to judge the potential for an exercise to help you build strength and muscle mass.

Here's an easy one to pick on: the dumbbell triceps kickback. It's ineffective for many reasons:

- The only portion of the movement that actually stresses the triceps is the last 30 degrees or so before lock-out. The rest of the movement is just your arm swinging back and forth. You could do that all day.
- It doesn't target many muscle groups. You work your triceps directly, and use some shoulder muscles to stabilize that joint so you can hold your upper-arm in a fixed position.
- You can't use serious weights. Even the strongest powerlifter wouldn't be able to use more than 25 or 30 pounds.

Now let's compare kickbacks to dips, the mother of all triceps builders:

- First, the position of your body relative to the position of your arms and shoulders works your triceps throughout the entire range of motion. At no point in the lifting portion of the exercise can your elbows operate without any resistance. (And you have to be careful lowering yourself, too, which adds some work for your triceps on that part of the exercise.)
- In addition to the huge demand placed on the triceps, dips also involve the chest muscles and deltoids so you're developing more muscle groups.
- The exercise allows you to use a seriously heavy load. You start with your

body weight, which is more resistance than you use on the overwhelming majority of exercises. Then you can add extra weight, attaching dumbbells or weight plates to a dipping belt.

All rise!

Let's say you have to choose between two exercises, and there's no really big difference in terms of loading. In that case, the choice may be as simple as picking the exercise that requires you to stand.

The human body is designed to function as a whole. Even though strength-training experts like to describe certain movements as "isolation" exercises, there's really no such thing as a movement that truly isolates one set of muscles while switching off all the others. And that's good; the more muscle groups you work, the more you get out of the exercise. Standing exercises are almost always better than sitting exercises because they require work from more muscle groups.

Practical example: I put a light dumbbell in your hand and tell you to lift your arm straight up in front of you. You know that exercise as a front raise. If I asked you what muscles are working on the front raise, you'd probably say it's the front of the shoulder, the anterior deltoid. That's the same answer I'd get from most personal trainers.

And you'd be wrong.

The anterior fibers of the deltoid are actually the *last* muscles to fire during a standing front raise. When researchers analyzed the electrical activity of muscles

during the front raise, they found that the first muscles to fire are actually ... the calves. Who would've guessed that? There's a simple reason: Your body must establish a solid, stable foundation before performing any movement. So calves fire first, followed by thigh muscles, hips and glutes, lower back, and abdominals. Finally, after all those other muscles have come into play, the anterior deltoid fires to lift the load. So if you want to maximize your training time, it's best to perform as many standing exercise variations as possible.

- Three benefits of standing instead of sitting:
- You'll develop many more muscle groups with each exercise.
- You'll reduce the need to perform exercises that target your body's smaller muscles.
- You'll train your body the way it's designed to function: as a whole unit.

Some exercises, of course, can't be performed while standing. The bench press is the most popular example. Even if you had a dual-cable system that allows you to perform a standing chest press, you still aren't going to be able to handle a lot of weight while you do it. Your balance will come into play, and sometimes it's harder to get the weights into position than it is to press them away from your chest. Both of those problems limit the amount of weight you can use.

Still, if you ever get a chance to perform standing chest presses on a machine that allows you to do it with good form (the Life Fitness Cable Motion machine is a good example), you should take advantage. You'll feel your body working from

head to toe, and especially notice a difference in your midsection, proving that just about every movement is a potential ab exercise.

The efficiency edge

Earlier, I mentioned the leg press as an exception to the loading rule. Even though you can use a lot of weight, it's not as good an exercise as the squat, which uses many more muscles. More important, the squat uses them in a way that applies to real-life strength.

Let's compare the three most popular exercises used to develop quadriceps muscles. First up: the leg extension. I've already noted that no exercise *completely* isolates one muscle group. So if you're working with challenging weights, other muscles like those in your midsection are going to come into play. But the leg extension does manage to disassociate some of your body's biggest muscles, your hamstrings and glutes, from the action of straightening your leg at the knee joint.

The leg press works the hip joints as well as the knees, which means it gets more muscles into action. Specifically, your glutes come into play at the hip joint, and your adductors (inner thighs) work to keep your thighs in alignment.

But your hamstrings are still out of action because of the angle of the leg-press machine. The same goes for the back extensors, the ropes of muscle on either side of your spine.

Which brings me to the squat. You start and finish the exercise with your body in a straight line from your neck to your ankles, so the hamstrings and back

extensors are worked along with the quadriceps, glutes, calves and just about every other muscle you can name from your abs to your feet. (And that's without mentioning the upper-body muscles that must work to keep the bar balanced across your upper back.)

It helps to look at the hierarchy of exercises in chart form:

Exercise	Developed Muscle Groups
Leg Extension	Quadriceps
Leg Press	Quadriceps, glutes, adductors
Barbell Squat	Quadriceps, glutes, adductors, hamstrings, lower back, abdominals, etc.

You could analyze most popular gym exercises the same way. Hamstrings? The leg curl works the least amount of total muscle, followed by the Romanian deadlift, followed by the deadlift. Upper back? The lat pulldown is okay, but pull-ups pull in far more muscles.

A bodybuilder might look at all this and still choose to do things the typical way, focusing on single muscle groups and isolating them as much as possible. I'll grant that it'll work, if you have the time, tenacity, and training skill to work every muscle thoroughly without overtraining your favorites and underworking the ones you aren't as fond of.

But, in my view, that's a very inefficient way to train. Why do 10 exercises for your lower-body muscles when two exercises, the squat and deadlift, will do the job at least as well, and in a fraction of the time?

I call the concept "training efficiency." Most of us don't have the time or

energy to work muscles individually, not to mention the skill to do it exactly right. So if we choose movements according to efficiency, we guarantee that we'll get the most possible benefit from every exercise we do.

In praise of complexity

The final consideration in exercise selection is complexity. The more complex the movement—the more it challenges your balance and coordination, as well as your strength—the more you'll get from the exercise. You may do squats because you want to develop your quadriceps. But you're also challenging many additional muscle groups and neural pathways. Coordination becomes an issue, along with proprioception—the sense of what your body is doing when it's in motion. This increased complexity leads to faster strength development, since your nervous system responds well to challenging movement patterns. Compare the complexity of squats to the simplicity of leg extensions, in which the range of motion is fixed and your body doesn't need to make special efforts to balance itself or coordinate muscle actions to protect your joints. Your body will recruit fewer muscle groups and engage fewer neural pathways.

Movement variations

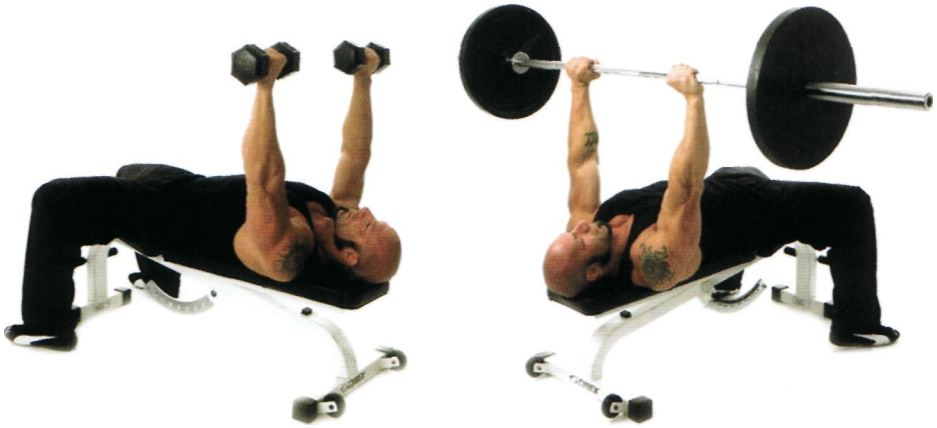
Your workouts can get stale without some variation. Some exercises, though, are so important to your development that you'll be tempted to include them in every phase of every program. I've found that some simple variations on classic exercises shake things up enough to allow you to keep making gains without

hitting a plateau.

The following are some of the challenging variations I've used over the years.

Barbell to dumbbells, or vice versa

Merely switching from, say, dumbbell bench press to barbell bench press is often enough to change the motor pattern so development can continue. The same is true with overhead presses, bent-over rows, deadlifts, and virtually any other exercise you can think of.



Hand-position manipulation

If you switch from bench pressing with a 32-inch grip between your forefingers to a 14-inch grip, it's a new movement pattern. With dumbbell movements, you can manipulate your hand positions to allow for a huge number of variations, even with seemingly similar exercises. Before I explain, let's take a look at the three

primary hand positions.

Supinated *Neutral (aka semi-supinated)* *Pronated*

You could perform standing biceps curls with a supinated (underhand) grip for one workout. Then, for the next, you could switch to a neutral hand position to target your elbow flexors differently.

Limb-position manipulation

Which muscles fire during a movement, and how they fire, depends on the position of the working limb relative to the joint where the movement occurs. Think of the dumbbell bench press. With a standard pressing technique, your upper arms are perpendicular to your trunk in the lowest (eccentric) position. Now, from that position, if you pull your elbows down and in so your upper arms are touching the sides of your rib cage, you've created a new motor pattern. So you could perform one bench press workout with your upper arms perpendicular

to your trunk, then you could do the next with your upper arms parallel to your trunk.

(Your arms won't be exactly parallel or perpendicular to your trunk, but you probably figured that out.) Each limb position causes the muscles around your shoulder joint to fire differently. The former will require more effort from your chest muscles, while the latter will force your triceps to take on more of the load.

Another example: You could do bent-over rows with your upper arms perpendicular to your trunk to put more emphasis on your rhomboids (upper-back muscles that lie beneath the trapezius) for one workout. Next time, you could move your elbows in and do the rows with your upper arms parallel to and brushing against the sides of your trunk. That way, you're putting more emphasis on your lats.

Manipulating your limb position works just as well with the lower body. Take the squat, for example. A narrow stance will emphasize your quadriceps more than would a wider stance. And a wider stance will emphasize your adductors—the muscles that pull your thigh bones in toward your midline—more than a narrow stance.

You may wonder why muscles take on different roles when you make shifts like these. The answer's pretty simple.

Muscle fibers run in different directions in different muscles. Sometimes it's easy to figure out the orientation—especially with exercises that work the biceps and triceps, whose main jobs are to bend and straighten the elbow joint. But it gets trickier when the muscles are acting on more complex joints, like the shoulders and hips. Choose any angle in which it's possible to move those joints—in, out, up, down—and you'll find muscles with fibers that run in the chosen direction.

So it stands to reason that, if you change angles and grips, you'll change the way you use your muscles, and that will have an effect on the way the muscles look and perform.

A word of caution, though: None of this discussion of muscle-fiber orientation is meant to contradict what I said earlier in this chapter about choosing the exercises that use the most muscle over those that use the least. The last thing I want is for you to fall into the bodybuilder trap of trying to work every muscle from every angle every time you work them. Most muscles either fire or don't fire on an exercise, and with the right loads on the right exercises, you'll get the results you want without having to worry about whether you have every angle covered.

My most important point is that these details help you reach your goals. They aren't goals in themselves.

Partial movements

If you saw a guy in the gym doing a quarter squat with a lot of weight, you'd probably think he was cheating—deliberately shortening the range of motion so he can brag to his friends about his new P.R. And he probably would be. But I've found that partial movements can produce big benefits, as long as you don't delude yourself into thinking that you're King Kong because you moved a really heavy weight a few inches.

Partial movements give you a boost in four different ways:

- They help you break through a plateau when you're starting to get stagnant with an exercise.
- They allow you to recruit the highest-threshold motor units—the muscle fibers and nerves designed to handle the heaviest possible workloads.
- They get your body used to the shock of handling weights that are heavier than you could lift through a full range of motion.
- They can relieve the joint stress that occurs with continuous full-range-of-motion exercises.

Fat grips

Another trick I like to employ: increasing the diameter of the barbell or dumbbell grip. You'll be surprised when you see how difficult a curl or bent-over row becomes when you fatten the grip. The result of the extra effort is an increase in your grip strength, which allows you to handle heavier weights when you return to standard-diameter barbells and dumbbells.

The easiest way to increase grip diameter is to wrap a towel around a barbell, or two towels around dumbbells. Your gym may have a "fat bar," an extra-wide barbell you can use for curls and rows. (If you train at home, you can buy one for about $100 at a variety of websites.) Ivanko makes a product called EZ Grips, which you can attach to most barbells and dumbbells to increase grip width. They sell for about $32 a pair.

Finally, you can use extra-thick workout gloves; Harbinger's Training Grip gloves retail for about $20. I'm not a fan of training gloves, but they can be useful in applications like this one.

Fatigue factor

Do you ever wonder why so many lifters have puny forearms and calves? Genetics aside, the answer can often be found in the structure of their workouts. Most people save forearm- and calf-focused movements for the end of their workouts, at which point they're too fatigued to put out much effort.

You may still have energy at that point, and you may not feel any particular fatigue in the targeted muscles. But you're still working with less energy and more systemic fatigue than you had when you walked into the gym. That means you'll be incapable of full effort in those exercises, which means the results will be compromised. I learned this lesson early in my training career, so I made two adjustments.

First, I place my clients' weakest movements at the beginning of their workouts. That means they can devote more energy to those movements. I don't

care if the movement is for calves, or forearms, or abs, which everyone assumes you're supposed to work at the end of a workout. Whatever needs the most improvement is first in line.

There's a big misconception about movements for the three aforementioned muscle groups: Training any of them first will impair your performance on other exercises. I don't agree. If it's behind other muscle groups, it's a problem, and one that requires action now so it doesn't hold everything else up down the road.

Second, I developed a rating system I call the "Fatigue Factor." This is based on the rate of perceived exertion (RPE) scale that many physiologists use. (Since I'm one of those, I get to use it.) RPE is a rating system that goes from 1 to 10, with 1 being easiest, and 10 being an all-out effort. Sleeping would earn a 1 rating, while running from an oncoming train on a narrow trestle over a thousand-foot gorge would earn a 10. I've compiled a list of RPE ratings for most major movements, and I use these ratings to design more effective workouts.

My method is simple: I pair movements that people rate on the high end of the scale with movements that people rate on the low end. The result is a balance of exercise intensity throughout your workout. So instead of cramming squats, deadlifts, and pull-ups on the front end of the workout, I spread them out, thus slowing down the rate at which my clients accumulate fatigue.

Here's a list of some common movements and the Fatigue Factor I associate with each:

Fatigue Factor	
Lower-body Movements	Upper-body Movements
Deadlift-10	Pull-up/Chin-up- 10
Back squat - 9	Push press -10
Hack squat - 9	Standing military press - 9
Front squat - 9	Dip-8
Romanian deadlift- 8	Bent-over row - 7
Lunge - 8	Pulldown - 6
Leg curl - 5	Bench Press - 5
Standing calf raise - 3	Seated row - 5
Seated calf raise - 2	Standing biceps curl - 3
Anterior tibialis (front calf) raise - 1	Lying triceps extension - 2

These are arbitrary numbers; you may rate some of them differently in either direction, just as one of my clients may rate a lunge a 9 instead of an 8, and another might a seated row a 4 instead of a 5. But one-point shifts in either direction simply aren't important. What matters is that you develop a basic understanding of the fact that different exercises produce more or less fatigue than others, and plan your workouts accordingly.

Another important point: Each rating is specific to either upper- or lower-body movements. Just because the deadlift and chin-up are both rated with perfect 10s doesn't mean they're equally fatiguing. I just assume that many of you reading this sometimes do split routines, with upper- and lower-body exercises performed on separate days.

If you superset movements—that is, if you alternate between exercises,

rather than doing finishing all your sets of one exercise before moving on to the next—you should pair the highest-rated movements in your workout with the lowest-rated movements.

This holds true with any type of workout, no matter if it's a total-body routine or if it hits upper or lower body exclusively.

For total-body workouts, you could superset chin-ups with standing calf raises, or deadlifts with lying triceps extensions. For upper-body routines, you could pair chin-ups with lying triceps extensions, or push presses with standing biceps curls.

It's okay to pair up two middle-rated movements, so a 4 could go with a 6, or you could superset a pair of 5s. So bench presses (5) and pulldowns (6) work well in a superset. So do seated rows (5) and leg curls (5).

What you don't want to do is pair up exercises that hit the same muscles, regardless of their Fatigue Factors. You wouldn't want to superset chin-ups (10) with biceps curls (3) because both exercises fatigue your biceps. Some mismatches aren't quite as obvious. For example, what would happen if you paired up deadlifts (10) with biceps curls (3)? You'd do a number on your forearms, burning out the muscles you need to grip the bar on subsequent sets of deadlifts.

The bottom line is this: To control fatigue, it's best to pair movements at opposite ends of the scale; movements at the mid-range of the scale; and/or movements that focus on antagonist muscle groups such as biceps and triceps, or chest and back.

In fact, alternating between antagonist muscle groups will not only minimize fatigue, but it can also improve your performance. Your nervous system is designed so that when one muscle group is excited (trained), its antagonist is inhibited. When you do a biceps curl, your triceps are inhibited. That allows them to recover more fully between sets, since they can't be activated while you're working your biceps. This principle, known as reciprocal innervation, was first observed by the uber neuroscientist, Dr. Charles Sherrington.

Dream Dates for Your Muscles

How to use antagonistic movement pairings to get bigger and stronger while keeping your joints safe and healthy

In a perfect world—well, in a perfect world for a coach or trainer—the muscles on the front of your body would perfectly match the muscles on the back of your body. That would make it easy for guys like me to design workouts. But, for some odd reason, exercise physiologists weren't consulted when human musculature evolved into its current configuration. So my colleagues and I have to make do with the material we have.

Let's start with the knee joint.

It has two main jobs: flexion (bending) and extension (straightening). You know the basics: the hamstrings flex the knee joint, while the quadriceps extend it. The hamstrings consist of three muscles: biceps femoris, semimembranosus, and semitendinosus. The quadriceps have four: vastus lateralis, vastus intermedius, vastus medialis, and rectus femoris. So right off the bat, we already have an imbalance of design—three of one, four of the other. This is why many experts believe that the hamstrings should be two-thirds as strong as the quadriceps: they have one-third fewer muscles, so they should be a third less strong.

To me, that doesn't make much sense—they're just numbers, disassociated from function. Ideally, in my view, all joints would have a balance of strength that's close to 1:1. For every major movement your joints perform, you should be equally strong in the countermovement. Thus, the muscles responsible for knee flexion should be as strong as the ones that extend the knee joint. My clients don't experience hamstring pulls or injuries, so I think it's safe to say that my methodology works.

I call these movements *antagonist strength pairings,* "antagonist" being any action that opposes another. Here are the antagonist strength pairings I've found most useful:

Recommended antagonist pairings with a 1:1 strength ratio

Upper body:

Barbell bench press and seated cable row (or chest-supported row)

Seated barbell shoulder press (only lower to the top of your head) and lat pulldown (or pull-up)

Seated hammer curl and lying dumbbell triceps extension on a decline bench

Lower Body:

Leg extension and leg curl

When testing the above pairings, it's important to use the same hand position for each movement. Let's use the barbell bench press and seated cable row pairing. If your index fingers are 32 inches apart during the bench press, they should be the same distance apart during the seated cable row. If you use a pronated (overhand) grip on one, use it on the other. I refer to this as an *exact antagonist pairing.*

I also recommend that you test your three-rep max for these pairings, rather than your 1RM. A true 1RM is very dependent on technique, whereas a 3RM tends to be more accurate for testing movement pairings. When you get above 3RM, muscular endurance can become an issue. (Don't misinterpret that statement as meaning that doing more than 3 reps is endurance training—it's not.) Some of us have more muscle endurance than others, which shouldn't be confused with strength. Thus, two guys who are equally strong in a 3RM for

an exercise might show different results for 10 or even five reps of the same movement.

I should also mention that the exercises I use to test comparative strength aren't necessarily the ones I'd use to train those movement patterns. I don't think leg extensions are very useful as an exercise, even though I like them for testing. Similarly, I recommend sitting while testing your 3RM on shoulder presses—it's better to test with fewer moving parts. But for training, I prefer standing presses hands-down over the seated variation.

Beyond those caveats, most exercises test pretty well. If you can bench 275 pounds for three reps, you should be able to row that much on a chest-supported machine. And if you can do three pull-ups with your body weight plus 25 pounds attached to your waist with a dipping belt, you should be able to match that in a seated shoulder press.

Agonizing over program design

If you're using this book to help you design better programs for yourself, you may be wondering how to apply the idea of antagonist pairings. For most upper-body exercises, it's simple. Do equal volume for bench presses and rows, shoulder presses and pull-ups or pulldowns, dips and upright rows, biceps and triceps exercises.

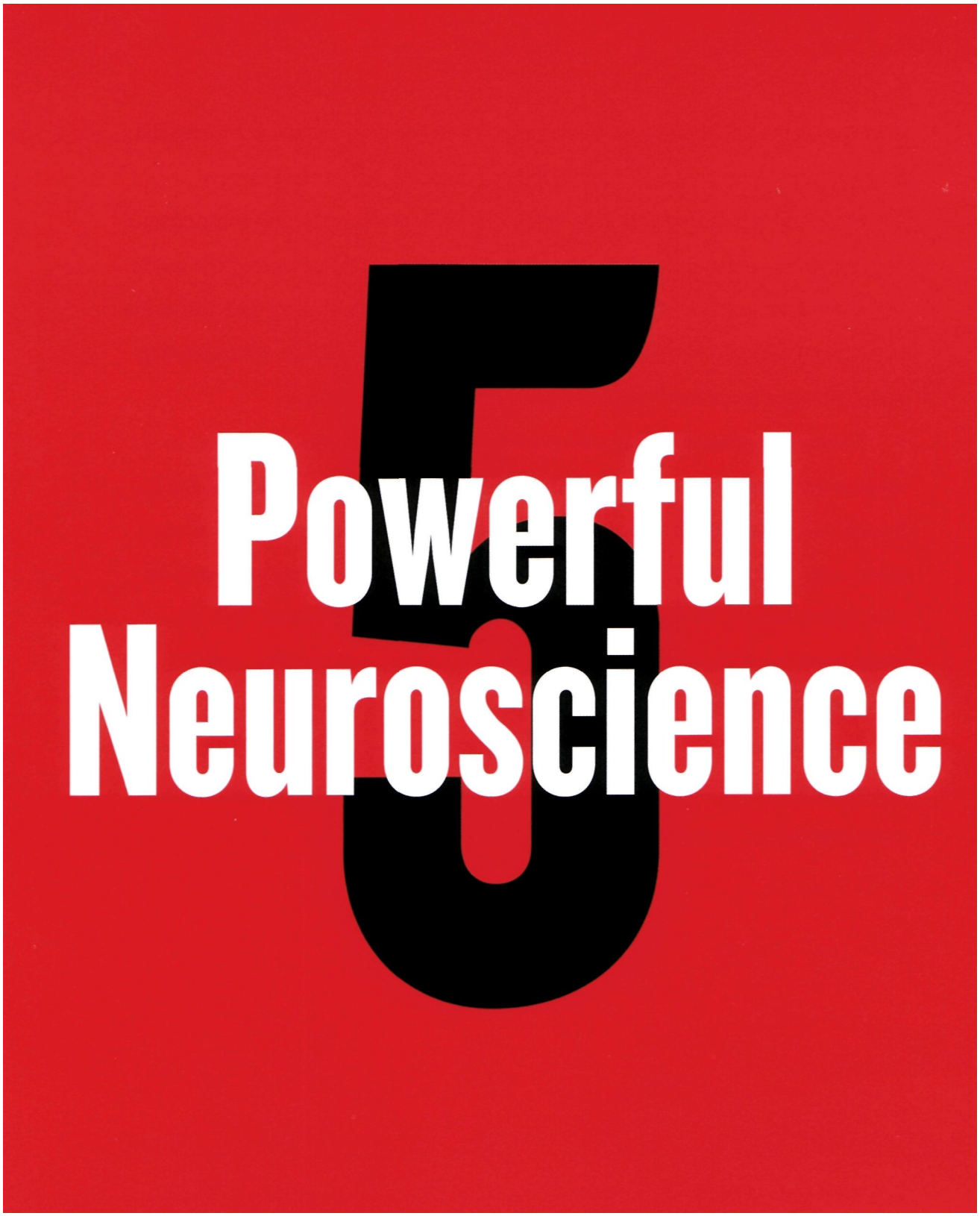
It gets trickier for lower-body exercises.

Most good programs include a balance of squats and deadlifts. That's good for your knee joints, since you're emphasizing your quadriceps (knee-extending

muscles) in the squat and your hamstrings (knee-flexing muscles) in the deadlift. But your hamstrings are also among the key muscles responsible for hip extension—straightening your hips when they're bent forward—and that action is key to both squats and deadlifts. So the two exercises balance each other out at the knee joints, but provide the same type of stimulus to the same muscles at the hips. There's even a similar challenge to the lower-back muscles, which work to keep the spine from shifting out of its naturally arched position.

So what provides an antagonist pairing for the hip-extending muscles? In other words, what's the opposite of hip extension? Hip flexion, obviously. But the muscles assigned to hip flexion—a quadriceps muscle called the rectus femoris, along with the hip flexors on the front of your pelvis—aren't nearly as strong as your hip extensors, by design. And your abdominal muscles, sitting opposite those lower-back muscles that work so hard in squats and deadlifts, aren't designed for massive loads, either.

The take-away lesson here is that antagonist pairings are easy and obvious for upper-body exercises, but require a bit more thought when it comes to the exercises that hit muscles below the chest.


5
Powerful
Neuroscience

I realized something important

early in my career as a trainer and coach: You can't understand the training components that enhance performance and aesthetics unless you understand the science behind them. That's why I've been enrolled in higher-education studies every year in which I've been involved this business.

After finishing a master's degree in physiology, I furthered my education with graduate-level neuroscience courses. Generally speaking, neuroscience is the study of the brain, spinal cord, and associated nerve cells, or neurons—the things that control your muscles. This chapter explains how and why they do it.

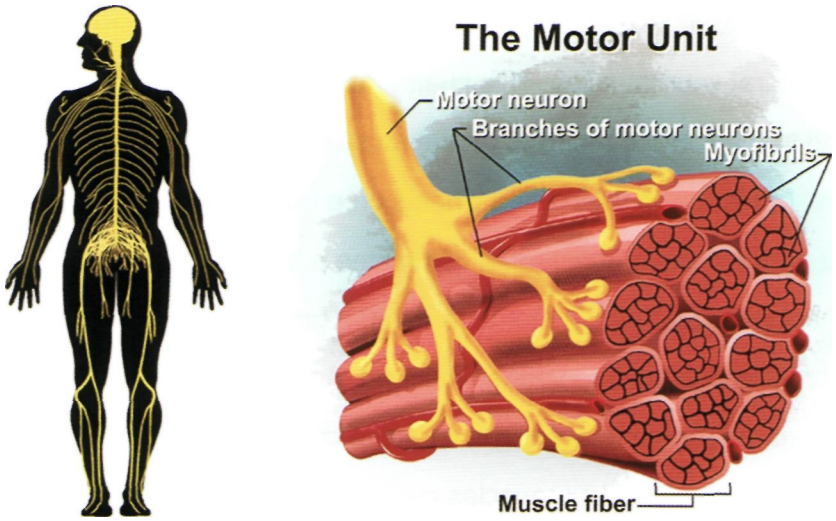
We tend to think of our muscles as the most important players in our movements, but in reality they're the wheels on a bus your neurons are driving. Before you perform any movement, a committee meets in your brain to decide how many neurons you're going to devote to the task. The marching orders travel from your brain and down into your spinal cord. As the message travels down the spinal cord, motor neurons jump out to take care of business—in this case, innervating your muscles. Your muscles contract because the motor neuron gave them a signal to do so.

Before I explain how a motor neuron leads to muscle contraction, let's look at the relationship between the two: the motor unit.

A motor neuron can innervate anywhere from a few muscle fibers to a few thousand. The combination of a motor neuron and its band of fibers is called a motor unit. The smallest motor units—the fewest fibers per motor neuron—are

usually found in the smallest muscles, while the biggest motor units are in the bigger muscles. So your finger muscles have small motor units while your hamstrings have big ones.

In the illustration below, you see a mammoth magnification of a motor unit. You'll notice that the individual muscle fibers are comprised of *myofibrils,* which themselves consist of even smaller bits: thin and thick proteins, called actin and myosin, which overlap, attach, and shorten to contract your muscles.



Here's how it works: There's a small space called the *neuromuscular junction* that separates your motor neuron from your muscle fibers. When your motor neuron is activated, it releases a neurotransmitter, acetylcholine, into the space. Acetylcholine spreads across the space and attaches to receptors on your

muscle membrane. This causes sodium to rush into your muscle membrane, and potassium to rush out, a process called *depolarization.*

Importantly, your muscle membrane traverses down inside your muscles. When this membrane is depolarized, it opens calcium channels inside your muscle. So calcium is released out into the intracellular space of your muscle. Calcium binds to a small protein, troponin, on your actin filament. (Think of troponin as a roadblock between your myosin and actin filaments. Troponin blocks the interaction of myosin and actin while at rest.) The binding of calcium causes troponin to shift out of the way so myosin and actin filaments can attach. Then, with the help of ATP, myosin and actin can slide past each other. This causes your muscles to contract—a surprisingly complicated process that was all started by a signal from the motor neuron. And as I mentioned, the combination of the motor neuron and all the muscle fibers it innervates is the motor unit.

Motor units are responsible for the forces that allow us to lift everything from huge weights to light pencils. Since some part of your body is in some kind of movement virtually every minute of every day (even your eyeballs move around when you dream at night), you can imagine how complex the relationship between muscles and nerves can be.

There are, however, some fairly simple principles that apply to strength training. Once you understand them, you understand why I advocate the techniques in this book, and reject some others that are very popular among other trainers.

First, and most important, is motor-unit recruitment. The more motor units you

can enlist in a task, the more force you'll be able to generate. The more force you generate, the heavier the weights you can lift. And the heavier the weights, the more strength and muscle mass you can build.

The same applies to any performance that requires an all-out sprint, throw, or leap—the more motor units, the faster the sprint or the harder the throw or the higher the leap.

Your body doesn't instinctively throw every motor unit into a task just because you want it to. We typically can't recruit all our motor units unless we're faced with a life-or-death situation. We can, however, train our nervous system to recruit a greater percentage of our available motor unit pool.

There are three primary types of motor units (with other subtypes that aren't worth including in this discussion; it's all a continuum):

- type S (slow-twitch), which produce small amounts of force for extended periods;
- type FR (fast-twitch, fatigue resistant) units that produce moderate amounts of force that can be sustained for moderate amounts of time;
- type FF (fast-twitch, fatigable) units that produce large amounts of force for brief periods of time.

Each motor-unit type works with specific muscle fibers:

Type I

These are the smallest muscle fibers, which contract slowest and are associated with endurance activities. They're the ones you use for tasks that don't require

much strenuous effort. So if you're standing in line at the movies, you're using Type I muscle fibers and Type S motor units.

Type MA

These are medium-sized muscle fibers that exhibit some endurance characteristics and some strength characteristics. A 400-meter run is a pretty good example; it's a fast pace, but one that can be sustained for a minute or two. You're using a combination of Type I and Type IIA fibers, which is to say a mix of Type S and Type FR motor units.

Type IIB/X

They sound like some experimental jet fighter the Air Force secretly tests at Area 51, but these fibers aren't particularly mysterious. (Sometimes they're referred to in scientific literature as IIB and sometimes as NX, so I combined the two to avoid confusion ... or maybe to create some.) They just aren't used very often by the average guy in the gym, despite the fact they're the biggest fibers in the body and capable of the most serious feats of strength and displays of power. You use type IIB/X fibers, and type FF motor units, when you lift a near-maximal weight (3RM or heavier) or run a 40-meter sprint.

I mentioned that you have other hybrid motor units, and that they're all part of a continuum. Here's the whole team of muscle fibers, with the smallest and slowest fibers to the left and the largest and fastest to the right. The three main types are in red. (1)

I → IC → IIC → IIAC → IIA → IIAB → IIB/X

(Smallest/slowest) (Largest/fastest)

Size matters

Until I studied the subject in school, I'd always thought that nerves were nerves. Some had more interesting jobs than others, but they were all basically the same size and shape. Not true, I learned. Nerves come in different sizes, just like muscle fibers. The bigger the nerve, in terms of its diameter, the faster it conducts the electrical signals that tell muscle fibers to move.

It's no surprise, then, to learn that the biggest muscle fibers are activated by the biggest motor neurons, and the smallest neurons work with the smallest fibers. If you're keeping score at home, here's how it all breaks down:

Motor Unit	**Motor Neuron**	**Muscle Fiber**	**Force Production**
S	Small	Type 1	Low
FR	Medium	Type IIA	Medium
FF	Large	Type IIB/X	High

When you think about these configurations in terms of human evolution, it all makes perfect sense. Let's say you're a prehistoric human, and you're being chased by a rather large predator who's not at all intimidated by that spear in your hand. You need to get the hell away, the faster the better. (Not that it's much consolation if you lose the race, but your descendants will later make a much bigger impression on his descendants when they pull out the Springfield .30-06. "Outrun *this,* you son of a ...") You have big, powerful lower-body muscles that are designed for just this purpose. Those muscles have a healthy distribution of type IIB/X fibers to allow for an explosive start. But without motor neurons that

can get the message to your muscles in time, you're a goner.

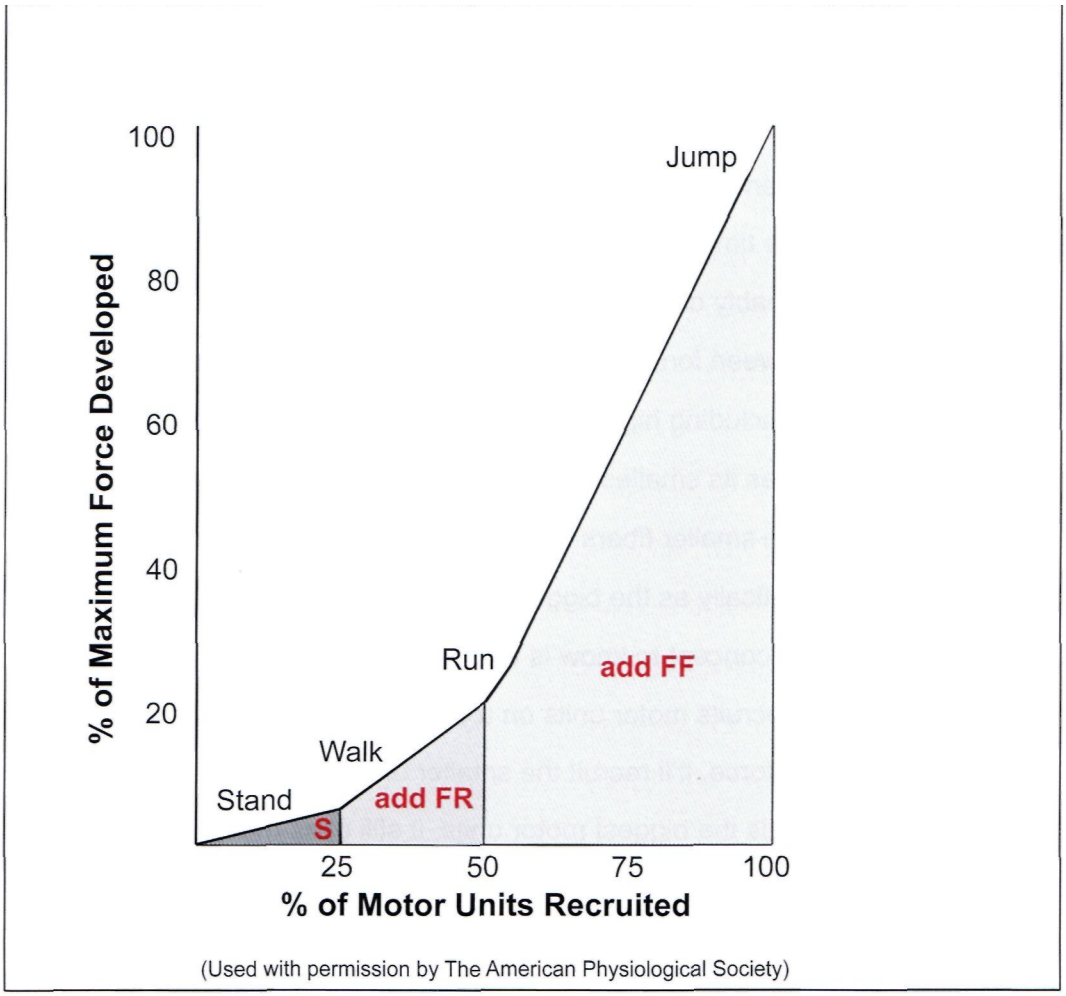
Today, it's unlikely you'll be chased by anything more imposing than a pollster, which is why it's so important to work your biggest motor units. The biggest fibers have the most growth potential, but they won't achieve it unless you work with near-maximal weights and/or fast lifting tempos. You can tell you're reaching them by the exhaustion factor: Since those fibers fatigue faster than others, two or three reps with 90 percent of your 1RM is the most you can expect. (If you've ever wondered why you can't do 30 reps with max weights, it's all about the size of the fibers involved and how fast they fatigue.)

What happens when you don't reach those big, powerful, fast-fatiguing fibers? Think about the times you've done high-repetition lifting with relatively light weights. You probably didn't gain much muscle size, if any. That's because of the relationship between force production and motor-unit recruitment. Endurance training—including high-rep weight lifting—doesn't require huge levels of force. Your body uses its smallest motor units, and keeps the largest motor units in reserve. Those smaller fibers can grow; they just can't grow much—certainly not as dramatically as the bigger fibers.

Another important concept to know is what we science geeks call the Size Principle. Your body recruits motor units on a continuum, from small to large. If the task requires little force, it'll recruit the smaller units and not use the bigger ones. But when it needs the biggest motor units, it still uses the smaller ones. With very few exceptions, your body will always recruit motor units in the same order, from small to medium to large. (2)

Here's an illustration:

The Relationship Between Force,
Motor Unit Recruitment, and Speed of Movement



(Used with permission by The American Physiological Society)

As you can see, when you're doing the most demanding movements—such as a jump or a max-weight lift—you don't just recruit the biggest motor units. *You use all of them*.* So heavy lifting is an equal-opportunity muscle builder: It hits the smallest as well as the largest.

This illustration makes another point: If you're going to do something, most of the time it's better to do it fast than to do it slowly. (Obviously, you don't want to use fast movements when you're just starting out or rehabbing an injury.) Slow movements recruit small and slow motor units. Fast movements require bigger and faster motor units, along with the smaller and slower ones.

Loading, of course, still matters. Baseball pitchers throw fast but don't end up with massive hypertrophy from the effort. That's because the ball is, you know, a *ball.* A round object, bigger than a testicle but not a whole lot heavier. Anything less than 50 percent of your 1 RM isn't going to produce a lot of muscle growth no matter how fast you lift it. (Which, of course, you know from Chapter 2.)

Final note about fast muscle actions: They require and develop a wide range of functional capabilities, including reactive ability, strength, endurance, motor coordination, and a few others that are just beginning to emerge in neuroscience research. Without perfect form, though, the effort is futile. You don't want your body to learn the wrong movement at any speed. Lift fast, control the eccentric phase, and always control the object you're lifting. If you don't, it will control you.

* As mentioned earlier, you can't recruit all your motor units unless you're in a dire situation. But it's likely that you can train your nervous system to recruit all of your non-emergency motor units.

Typecasting

Ever wonder how scientists determine which fiber types are which? No? Oh. But it's really ... Not buying it, huh? Well, look, I think it's really interesting, and if any of you agree, here's the info.

Scientists have four tests they use to measure the physiological and biochemical properties of skeletal muscle. (Skeletal muscle is the stuff you try to build in the gym. There are two other types: cardiac muscle, which controls your heart, and smooth muscle, which provides the power for your internal organs and other things that work whether you think about them or not.) Here's a brief look at each of the properties they examine.

Speed of shortening. As I said elsewhere in this chapter, muscle fibers get classified as "slow twitch" or "fast twitch." "Twitch" is a word you don't hear used very often these days, since what a muscle fiber really does to produce force is shorten, or contract. So the speed at which a fiber can shorten is the first classification. Type IIB/X muscle fibers contract fastest; type I muscle fibers contract slowest; and type HA contract at an intermediate speed. The faster the contraction, the greater the force, which is why type IIB/X fibers can generate the most power, and type I the least. (Do I even need to add that type MA are somewhere in between?)

Oxidative capacity. You know the word "aerobic." It means "with oxygen." You

probably know that maximal strength training is mainly an "anaerobic" activity, which means your muscles can't use oxygen while doing it. Since you also know that the muscle fibers primarily used during aerobic exercise are the smallest, and that the fibers you use when lifting heavy loads are the largest, you can deduce that the smallest fibers have the greatest oxidative capacity. That is, they can use the most oxygen during exercise.

Oxygen is used by tiny cells called mitochondria, which reside within muscle fibers. Thus, if a researcher wants to know which type of fiber he's looking at in his microscope, he can tell by the number of mitochondria within that particular muscle cell. Type I fibers, designed for long-distance locomotion, have the most mitochondria, and type IIB/X the fewest.

Glycolytic potential. The opposite of "oxidative capacity" is "glycolytic potential." That's because muscle fibers rely on a process called glycolysis to produce energy when they can't use oxygen. The goal in either case, with oxygen or without, is to renew ATP as quickly as possible. ATP (adenosine triphosphate) is the energy source of all human cells, including muscles. Muscle fibers can't store much of it, so they have to replace it on the fly when you exercise. The type I fibers use oxygen to make more ATP, and the larger fibers use glycolysis. Thus, the biggest fibers, type IIB/X, have the most glycolytic potential, even though they're also the fastest to fatigue.

Why?

The simplest answer is that glycolysis is really hard for your body to sustain. You may have guessed, from looking at the word, that it has something to do

with glycogen, which is stored sugar. Your body uses a mix of fat and sugar when you're using your aerobic energy system. (Such as now, as you sit and read this.) It takes a tremendous amount of effort to use sugar to make energy via glycolysis. Thus, like a teenager's first romantic experience, it's over in a hurry.

Myosin heavy-chain-based fiber type. You may have thought I'd maxed out on ex-phys jargon when I used "glycolysis" and "adenosine triphosphate" in the same paragraph. Not so. I have lots more where that came from, and this section is proof.

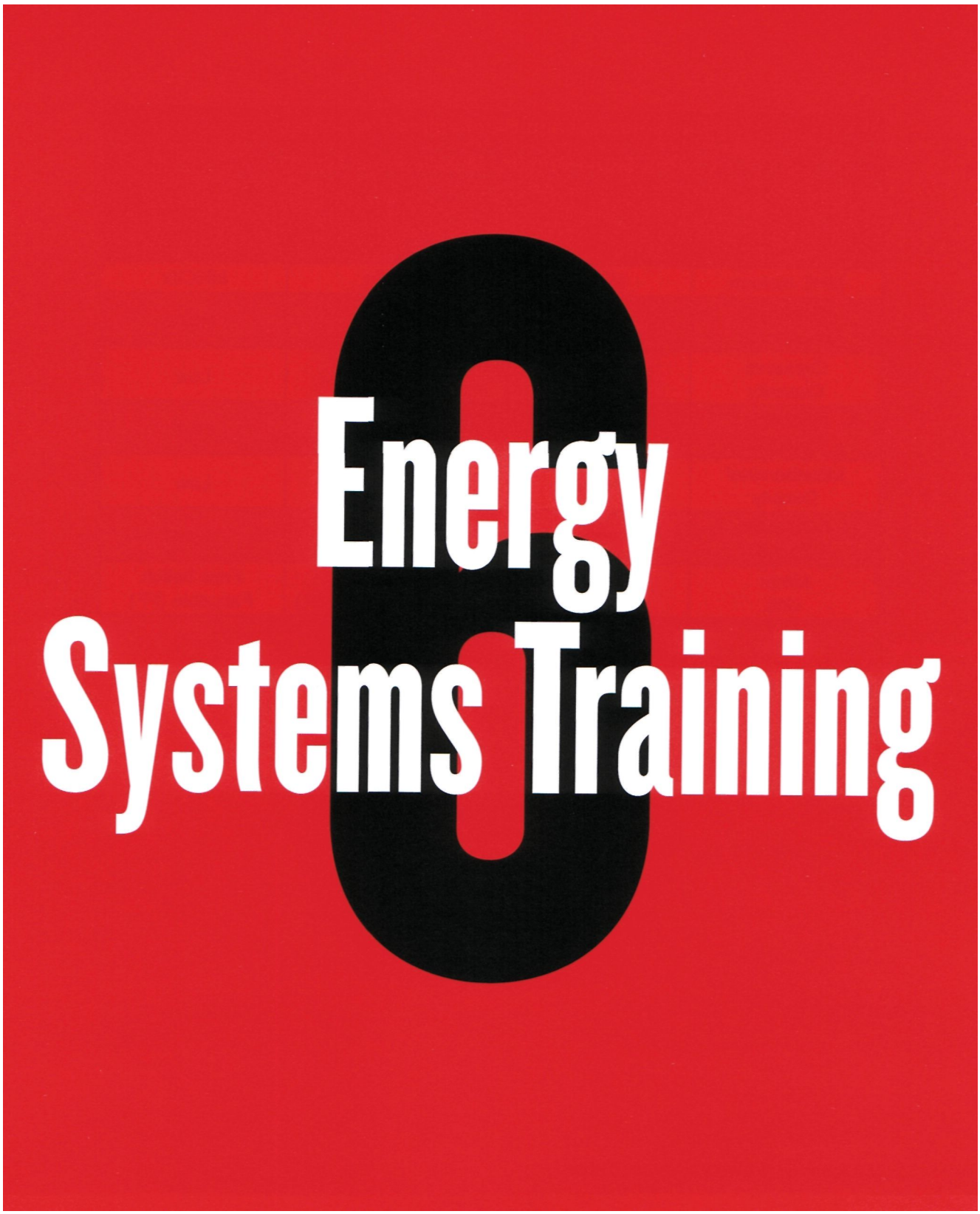
Let's start with a word you've already seen: myosin. It's one of the two types of tiny protein filaments that cause your muscles to move. (Actin is the other. You can remember the name because it sounds like an athlete's-foot powder.) Myosin heavy chains—MHCs—are the combinations of filaments that determine the speed of contraction, force, and energy suck within muscle fibers.

Strength training changes the structure of MHCs, and changing the structure of MHC affects performance by increasing the speed at which muscles can contract. And, as I've already noted, faster contractions mean greater force. More force means more productive workouts, and thus bigger muscles.

So even though you never walk into a gym thinking about how you're going to alter your MHC structure, that's the goal. And by looking at an individual muscle fiber's MHC structure, a researcher can figure out its force-generating capacity, and thus determine whether it's a weaker (type I) or more powerful (type IIB/X) fiber.

Here's a handy chart to make it all clear:

Physiological and Biochemical Properties of the Three Primary Muscle Fiber Types			
Parameter	**Slow Oxidative (SO); Type 1**	**Fast Oxidative Glycolytic (FOG); Type IIA**	**Fast Glycolytic (FG); Type IIB/X**
MHC Isoform	MHCI	MHCIIa	MHCIIx
Speed of Shortening	Low	High	High
Oxidative Capacity	High	High	Low
Glycolytic Potential	Low	High	High
Mitochondrial Density	High	Moderate	Low
Contractile Speed	Slow	Fast	Fast
Motor Unit	Slow-Twitch (S)	Fast-Twitch Fatigue-Resistant (FR)	Fast-Twitch Fatigable (FF)


Energy
Systems Training

Cardiovascular training is like a girlfriend with bipolar disorder.

When it's good, it can improve your health in a number of ways—lowering your blood pressure, slowing your resting heart rate, improving your cholesterol profile, and burning off visceral abdominal fat. (That's the dangerous stuff that gathers around your internal organs, as opposed to the flab right under your skin, which merely hides your abs from public view but isn't as serious a threat to your health.) When it's bad, it can cost you some of your hard-won muscle mass.

My goal with this chapter is to give your cardio training a dose of lithium. With this information, you'll be able to get the benefits without any of the drawbacks.

First, let's define the issue. You'll notice I didn't use the words "cardio" or "aerobics" in the chapter title. I think it's more useful to think in terms of "energy systems" training. I touched on the topic of energy systems in Chapter 5 when I explained how some muscle fibers have more oxidative or glycolytic properties. I also mentioned that the goal is to generate more ATP for energy, whether it does this with oxygen or without.

That's as good a place as any to start.

The Big Three

Your body has three primary energy systems:

- adenosine triphosphate-phosphocreatine (ATP-PC);
- anaerobic glycolysis;
- aerobic metabolism.

When you start moving, no matter what it is you're doing, the first energy

system to come into play is the ATP-PC system. You already know what ATP is (energy stored in all your body's cells for immediate use), and you've undoubtedly heard of phosphocreatine, otherwise known as creatine phosphate. No, the supplement industry didn't invent it; they just figured out how to produce it for substantial profit. It's a chemical in your muscle cells that allows you to generate more ATP for short-duration efforts at or near maximum intensity.

Even with those two sources of energy—the ATP that's already in your muscle cells, and the phosphocreatine that helps generate more—you're still lucky to sustain a max effort for 15 to 20 seconds. (I'll have more to say about supplemental creatine in Chapter 7.)

When you need to go longer than that, downshifting from top speed to a pace you can maintain for a minute or two, you have to use anaerobic glycolysis, the other energy system that allows you to make ATP without oxygen.

I noted in Chapter 5 that this system uses glucose, rather than phosphocreatine, to produce ATP. Since oxygen isn't available, your body has to work some physiological magic to produce fuel for muscle contractions. That requires another chemical you may have thought the supplement industry invented: pyruvate. Pyruvate is an intermediate chemical between glucose, the breakdown of which produces it, and a bunch of other things. It can be converted back into carbohydrate, into fat, or into lactate, better known as lactic acid. In plants, it can even be converted into ethanol, also known as "grain alcohol." In that sense, it's sort of the senior class president of biochemistry, the kid who can assimilate into any social group: the popular kids (carbohydrate), the brainiacs

(fat), the jocks (lactate), even the stoners (ethanol).

The conversion to lactic acid is my focus here. If you've heard of lactic acid, it was probably in the context of something that isn't true. Trainers and bodybuilders used to believe that lactic acid created post-workout muscle soreness, which we've known for some time isn't true. And, until recently, most fitness professionals (myself included) believed that lactic acid also causes fatigue, and thus a decrease in force production and performance. Recent scientific findings have debunked this myth. One of the leading researchers in this area is Dr. George A. Brooks from the University of California, Berkeley. He found, in rat muscles, that lactate was actually a *preferential* source of fuel for muscle contractions. It creates a quick source of energy in working muscles. This is quite a reversal in the conventional wisdom. Not only is lactate not the bogeyman, it's now the good guy.

Here's how all this works in real life:

Let's say I put you on an exercise bike and told you to pedal as hard as you could for 30 minutes. During the first 10 to 20 seconds, you'd be able to pedal hard and fast, thanks to phosphocreatine, your muscles' most immediate energy source.

But once you reached the 20-second mark, your PC would be depleted, and anaerobic glycolysis would kick in. You'd be generating tons of lactic acid, and burning it off as fast as you can make it. At this point, you're still pedaling as hard as possible, but your pace is considerably slower, and you're breathing hard. If you're a well-trained athlete, you might be able to go up to 10 minutes like this,

using lactate for fuel.

Why not longer? We really don't know. It probably has something to do with the supply and demand of oxgen while pedaling so hard. Aerobic metabolism—the use of oxygen to break down carbohydrate and fat for energy—is much, much, *much* more efficient than the anaerobic pathways. That means it uses less energy to get the job done. The tradeoff is that you can't push yourself as hard. Efficiency comes as the expense of speed and power.

That doesn't mean you can't use anaerobic glycolysis off and on throughout your ride. You can rev it up for sprints or tough hill climbs. You just can't use that system continuously. Using it sparingly, though, still offers one pretty huge benefit: Some research shows that lactate is linked to growth-hormone release. This is one of the reasons why high-volume weight workouts, which generate lots of lactic acid, are effective for both building muscle and burning fat.

Let's get back to your bike ride: Now that you're using your aerobic metabolism, you're not pedaling as fast or as hard, but you're also not breathing as hard. You're working at a pace that allows you to go longer distances. Almost everybody reading this could go out right now and pedal a bike for hours, since your aerobic metabolism makes such efficient use of your body's resources. Well-trained endurance athletes, as you know, can run, ride, or swim for hours at a time, while some elite ultramarathoners can go for days.

But you aren't reading this book for its advice on ultramarathon running. So let's shift gears and talk about how you can use your aerobic energy system for better performance, better health, and better body composition.

Cardio, schmardio

I can remember a time when "cardio" referred exclusively to long-duration endurance exercise. Today, the word is used for anything that increases your heart rate. That could include 100-meter sprints, circuit training with weight machines, rock climbing ... Heck, stepping out in front of a bus will raise your heart rate. But is it cardio? (No, it's a surge of epinephrine, a stress hormone, also known as adrenaline.)

This is why, in my view, it's useless to describe exercise in terms of how it affects your heart rate, and very wise to think of it as affecting one or more of your energy systems. And, again in my view, your best plan for fat loss is to use at least two of them.

Intuitively, most of us think that aerobic metabolism is the best choice for fat loss. It has two big advantages: It burns lots of calories during a typical workout of, say, 45 to 60 minutes. Even better, your body actually uses fat for energy while you do it, along with glucose.

However, it's not quite that easy or simple for the guy who's most interested in building his body. First, how many muscle-focused guys have the time or inclination to go out and run 45 to 60 minutes several days a week? Second, there's a real risk of muscle loss with excessive aerobic training, due to your body's release of the stress hormone Cortisol. Cortisol signals your body to break down muscle tissue to make glucose for energy. (What constitutes "excessive" will differ from one person to the next.) Third, there's a real risk of overtraining if you're trying to combine the workouts in this book with a high volume of

endurance exercise.

I think the best solution is to approach fat loss with two of your three energy systems:

- Use anaerobic glycolysis to release growth hormone, which signals your body to store protein in your muscles and use fat for energy after you finish exercising.
- Use your aerobic metabolism to burn fat as fuel during exercise.

If my clients have no functional need to develop more aerobic endurance, I usually limit their steady-state cardio work to 20 minutes. That's enough time to tap into fat stores, but not enough to risk muscle loss.

With beginners, I stick with low-to-moderate intensities for the entire 20 minutes. That means walking fast, usually. Intermediates will probably start out walking and then shift into a slow jog, while advanced trainees do 20 minutes of continuous running.

Of course, I base all my programs on the individual client's needs. If he needs to sprint, I'll help him develop his ATP-PC system and won't worry much about his aerobic metabolism. If his goal is to increase his endurance, then I'll do the opposite.

Before I get into specific programs, I want to mention the importance of staying active outside of the gym. I can picture some of you rolling your eyes when I say it, but for most people, simple lifestyle changes make it considerably easier to achieve the desired results. The more active you are, the leaner you'll

be. Put another way, the more miscellaneous activity you rack up outside the gym, the less purposeful activity you'll have to do inside the gym. Minutes on the sidewalk are minutes you don't have to spend on a treadmill.

I'm talking about basic stuff: taking the stairs instead of the elevator, and deliberately parking farther away from your destination, rather than circling the block until you find a parking spot closer to the front door. (Taking the first space you see will cut down on your gasoline costs as well.)

It may seem like this advice is just for beginners or fatasses, but it's not. I have all my clients incorporate more daily activity. I wouldn't bother if it didn't help them accomplish two important goals: They get leaner, and they achieve better muscle recovery because they're increasing blood flow.

Beginner program

If you're relatively new to exercise, you can get a lot of benefit from moderate-intensity, medium-duration cardio training. But I've seen a lot of beginners struggle to find the right intensity for this type of exercise. Some don't want to push themselves, and some try to push themselves too hard. Here's a way to take the guesswork out of your choice:

You may have read that exercise intensity has something to do with your heart rate, expressed as beats per minute. Since your max heart rate is usually noted as "220 minus your age," it should be simple to plug in the desired intensity as a percentage of that. Thus, if you're 30, your predicted max would be 190. If you were trying to exercise at a moderate intensity—60 to 70 percent of your

max, for example—you'd shoot for a steady heart rate of about 114 to 133 beats per minute (bpm).

The problem here is that the standard formula doesn't work for everyone. Your actual max could be a lot higher or lower, and 133 beats per minute could be way too easy or way too hard for you. That's why I use something called the Karvonen formula, which is a more accurate way to predict your max heart rate and determine your ideal exercise range.

Here's how it works:

Step 1: determine your resting heart rate

For three mornings in a row, take your pulse for a minute as soon as you can after waking up, before you get out of bed. Add the numbers and divide by three. For the sake of this discussion, let's say your resting heart rate (RHR) is 65 bpm.

Step 2: determine your predicted max heart rate (MHR)

Since you're 30 in this example, you already know your predicted max is 190.

Step 3: subtract RHR from MHR to determine your heart-rate reserve

Your number is 125. Because we don't already have enough acronyms in this chapter, we're going to use "HRR" from now on when we mean heart-rate reserve.

Step 4: determine your target training zone

Since you're a beginner, your best training range is probably 60 to 70 percent of your HRR. Multiply your HRR by .60 and .70 to get that range. In this case, it's 75 to 87.5. (I'm going to cut off the fraction for the rest of this example, and call it 87.)

Step 5: add RHR to get your target training zone

This is the "secret sauce" of the Karvonen formula. When you add 65 to each number, you get a target training zone (TTZ) during exercise of 140 to 152 bpm.

As you can see, a target range of 140 to 152 is considerably different from the original range of 114 to 133. If you're the guy in this example, you wouldn't work up much of a sweat even at the top range of 133 bpm. But 152? Different story.

Here's your program.

Beginner Aerobic Energy System Progression:

Weeks 1 and 2

TTZ: 140-152 bpm

Weekly sessions: 3

Workout duration: 20 minutes

Now it's time to make it more challenging by increasing the TTZ by 5 percent. We'll do this every two weeks.

Weeks 3 and 4

TTZ: 147-160 bpm

Weekly sessions: 3

Workout duration: 20 minutes

Weeks 5 and 6

TTZ: 154-167 bpm

Weekly sessions: 3

Workout duration: 20 minutes

So now you've increased your original TTZ by 10 percent, and it's time to focus on speed instead of heart rate. If you've been walking or jogging on a treadmill, this part's easy. All you need to do is keep track of your walking speed during the last workout of week 6. Let's say your speed was 4.3 mph. Your goal is to increase your speed by 0.1 mph each workout. Therefore, week 7 would look like this:

Week 7

Session 1

Speed: 4.4 mph

Duration: 20 minutes

Session 2

Speed: 4.5 mph

Duration: 20 minutes

Session 3

Speed: 4.6 mph

Duration 20 minutes

No treadmill? Find some way to measure the distance you walked or jogged in your last session of week 6. If you used a track, add up the laps. (If you finished with a partial lap to avoid going over 20 minutes, estimate the percentage of a lap you finished the final time around.) If you walked or jogged on streets or

sidewalks adjacent to streets, drive the route in your car and measure it on your odometer.

Let's say the distance is 1.5 miles. That's 4.5 mph. (Since 20 minutes is a third of an hour, you multiply the distance by three to get mph.) Your goal is to cover the original distance in slightly less time with each workout. Then keep going at that pace until you hit 20 minutes.

Yes, it's going to be imprecise. For example, in the first workout, you want to go 1.53 miles, instead of 1.5, in 20 minutes. And then 1.57 miles, and then 1.6. You're adding 53 yards per session. If each of your strides is one yard (36 inches), that's 53 additional strides. Like I said, it's not as easy as turning up the speed on a treadmill, but it is motivating and fun to realize you're doing more each workout. Luckily, Nike and some other fitness companies make watches that can measure your speed and distance, allowing you to do this with more precision than was possible just a few years ago.

You can keep going like this for as long as you want—months, if you like it and it's still working.

Intermediate program

First, a fundamental question: How do you know if you're an intermediate? Well, when you read the Beginner section (and you do have to read it; otherwise, this information will make no sense whatsoever), did you think, "Oh, hell, that's too easy for me"? If so, you're probably an intermediate. If you need something more concrete than that, consider yourself an intermediate if you've been training

steadily and consistently for at least six months to a year.

I'll start with the same assumptions—you're 30 years old, have a resting heart rate of 65, and therefore a heart rate reserve (HRR) of 125. (Like I said, if you skipped over the Beginner section and went straight to this, you really need to go back so you can learn what all this fun terminology means.)

This time, your target training zone (TTZ) for the first two weeks is 70 to 80 percent of HRR, which works out to 152 to 165 bpm. As in the Beginner program, you'll increase it 5 percent for weeks 3 and 4 and another 5 percent for weeks 5 and 6.

Intermediate Aerobic Energy System Progression:

Weeks 1 and 2

TTZ: 152-165 bpm

Weekly sessions: 3

Workout duration: 20 minutes

Weeks 3 and 4

TTZ: 160-173 bpm

Weekly sessions: 3

Workout duration: 20 minutes

Weeks 5 and 6

TTZ: 167-182 bpm

Weekly sessions: 3

Workout duration: 20 minutes

After Week 6, increase speed by 0.1 mph each session. Or, if that's too much, you can increase it every other session, or just once a week. Your goal is to get to the point at which you can run continuously for 20 minutes at a pretty good clip.

Advanced program

Energy-system training is relatively simple for beginners and intermediates, trainees who want to look better and stay healthy. Not easy to do, certainly, but straightforward and easy to understand. But when someone is truly an advanced athlete, and has very specific performance goals that may very well determine his or her ability to earn a living, it's a far more complex challenge.

That's because many athletes need to develop all three energy systems. That doesn't apply to athletes at the extremes—sprinters don't focus on the aerobic energy system, and marathoners have little need to boost their ATP-PC system—but it does include almost everyone else who wants to raise the level of his game.

Developing the ATP-PC system

Aside from the aforementioned marathoners, it's hard to picture any athletes who don't need the short bursts of all-out speed and power they get from the ATP-PC system. Who wouldn't be better at their sport if they were a step or two faster? And some athletes—including football linemen, Olympic weightlifters, and Strongman competitors—depend on the ATP-CP system more than any other.

I've found that 100-meter sprints work well with most power athletes. The progression I use is based on the work-to-rest ratio. I'll start a reasonably well-trained power athlete with a work-rest ratio of 1:10. For example, if you run 100 meters in 15 seconds, you'd rest for 150 seconds before repeating the sprint.

The initial phase of training consists of three sprint sessions each week. As you'll see in the following chart, I use two systems of progression: adding an extra sprint per session in each week, and decreasing the work-rest ratio from one week to the next. You'll notice that Week 4 is a recovery week, meaning you'll back off a bit on the number of sprints while maintaining the work-rest ratio:

100-meter Sprint Training			
Week	Workout	Sprints	Work-rest ratio
1	1	6	1:10
	2	7	1:10
	3	8	1:10
2	1	6	1:9
	2	7	1:9
	3	8	1:9
3	1	6	1:8
	2	7	1:8
	3	8	1:8
4	1	4	1:8
	2	5	1:8
	3	6	1:8
5	1	6	1:7
	2	7	1:7
	3	8	1:7

This periodization plan continues until you reach the work-rest ratio that's optimal for the demands of your sport.

Let's say you're a football player, which is certainly one of the best examples of a sport that primarily taxes the ATP-PC system. In Week 1, you were doing 100-meter sprints at a work-rest ratio of 1:10. Of course, a football player wouldn't run that far on most plays; even a wide receiver rarely runs farther than 40 yards per play. And the average play is probably five seconds, with about 30 seconds from the whistle ending the play to the snap of the ball on the next play. But everyone on the field has to be *prepared* to go hard for 15 seconds, and no matter how winded you are after one play, you still have to be ready for the next within 30 seconds.

So, ideally, you'd want to train until you reach a work-rest ratio of 1:6. Believe me: If you can repeat 100-meter sprints with that little rest in between, you'll have a significant edge over most of the others on the field, in terms of conditioning.

Developing the anaerobic glycolysis system

Any sport that requires high levels of muscular activity for longer than 20 seconds but less than three minutes is highly dependent on anaerobic glycolysis. That includes soccer, hockey, basketball, tennis, and other racquet sports. If you're in one of those sports, you'll get a big boost from 400-meter sprints. You'll use the same work-rest ratio as I recommended for the ATP-PC system, but do fewer sprints per session, and fewer sessions per week. Week 4 is still an unloading week:

400-meter Sprint Training			
Week	Workout	Sprints	Work-rest ratio
1	1	2	1:10
	2	3	1:10
2	1	2	1:9
	2	3	1:9
3	1	2	1:8
	2	3	1:8
4	1	1	1:8
	2	2	1:8
5	1	2	1:7
	2	3	1:7

As with the ATP-PC program, you can keep going like this until you hit the work-rest ratio that's most appropriate for your sport.

Developing the aerobic system

Aerobic metabolism is the primary energy system used with continuous activity. It takes over around the 6-10-minute mark during continuous muscle contractions. Since aerobic metabolism is very efficient, it can keep up with your energy demands for hours, as I noted earlier.

As it happens, your body uses multiple energy systems for most of the challenges you throw at it. Martial artists, skiers, and soccer players tend to get high marks for aerobic power, expressed as V02max. That doesn't mean they're out on the field chugging along at a continuous six-minute mile pace. It means that they use anaerobic glycolysis or even the ATP-CP system for short bursts, and use the aerobic system when they get a chance to slow down and recover.

So you need some aerobic-system development if you're going to succeed in sports like these. But you still have to use aerobic exercise judiciously. All the sports I just mentioned also require speed, strength, and power, and in some cases (football, for example) hypertrophy is helpful. But those four qualities are at risk any time you set out to do steady-pace endurance exercise.

I don't mean to say your muscles start shrinking the minute you lace up your running shoes. But you do have to be cautious; spend too much time on the road, and your body will preferentially develop its type I muscle fibers, which have the least potential for force production. On top of that, if you're combining endurance work with a high volume of other types of training, you risk generating too much of the stress hormone Cortisol, which can lead to muscle loss and fat storage.

So my recommendation for advanced athletes is the same as for beginners and intermediates: no more than 20 minutes per session of steady-pace endurance exercise, no more than three times a week.

As with the beginner program, you should aim for a target training zone of 60 percent of your heart-rate reserve. Why so low? If you're truly an advanced athlete, you probably have a very high aerobic capacity already. You're probably young, and you probably have a low resting heart rate—lower than the 65 bpm used in the examples for beginners and intermediates. So at 60 percent of your capacity, you'll still be able to chug along.

However, I recommend following a different progression from the one outlined in the beginner program. You won't worry about increasing your target training zone. Instead, after establishing a baseline for speed and/or distance in the first

workout, aim to increase your speed by about 0.1 mph in subsequent workouts.

When you get to the point at which you can run three miles in those 20 minutes, consider yourself at the upper end of your aerobic-system development. There's no need to train your body to run long distances faster than that, and there's a real risk of losing muscle and strength if you try.

Interval Training

So far, I've talked about energy-systems training in terms of extremes: sprints for the anaerobic systems, and steady-pace running for the aerobic system. But most of you reading this already know that there is something in the middle: interval training, the best-of-all-worlds way to develop all three energy systems.

Simply put, interval training is when you alternate between high- and low-intensity exercise. For example, a short sprint followed by a brisk walk is interval training.

For the beginner or intermediate, it offers a faster way to burn fat and strengthen your heart. For the advanced athlete, it presents a more sport-specific way to develop energy systems. Most sports involve starts and stops, constant shifts of speed and, by extension, shifts from reliance on one energy system to primary use of another.

And, aside from its functional, sport-specific qualities, it's also time efficient. Let's say you're pressed for time, and you can only devote 10 minutes to energy-system training. Now, 10 minutes of brisk walking isn't going to do much of anything; on the other hand, a flat-out sprint isn't the best idea either, since you

don't have enough time to warm up properly. However, a series of alternating fast runs and brisk walks is possible, and I'd argue that it would be a better use of time for most trainees than 10 solid minutes of one thing or another.

But let's look at interval training in a different way, as a technique to develop endurance and burn calories without sending your body the wrong signals.

Here's what I mean: If you look at an elite sprinter, you notice that these guys have very muscular thighs. (As do the women sprinters, for that matter.) Sure, they build muscle in the weight room, but their sprint training has some effect. When you perform a maximal sprint for 10 to 20 seconds, you're primarily challenging your largest muscle fibers. That's great for them, and it can be great for you, if you're involved in any strength and power sport.

If these same athletes spent their time walking fast or jogging, they wouldn't be challenging their largest muscle fibers. Not only that, but research has demonstrated that long, slow activities can cause your muscles to make a transition toward smaller, type I, endurance-oriented fibers. You know by now that type I fibers are the worst at producing maximal strength and power. That's not to say that the type I la fibers won't come into play with walking—they certainly can. But they just won't get the type of work that leads to greater strength and hypertrophy, unless you're recovering from a serious illness or injury, and the muscles are so weak and atrophied that walking presents these fibers with a serious challenge.

So by doing high-intensity intervals—sprints and recovery—you'll develop your body's most powerful fibers, rather than compromising them. And, because

you're also generating lactate in your muscles, you'll trigger growth-hormone release, which will help you burn more fat after your workout is finished. (The growth hormone release from sprinting is not huge, but any increase helps the cause.)

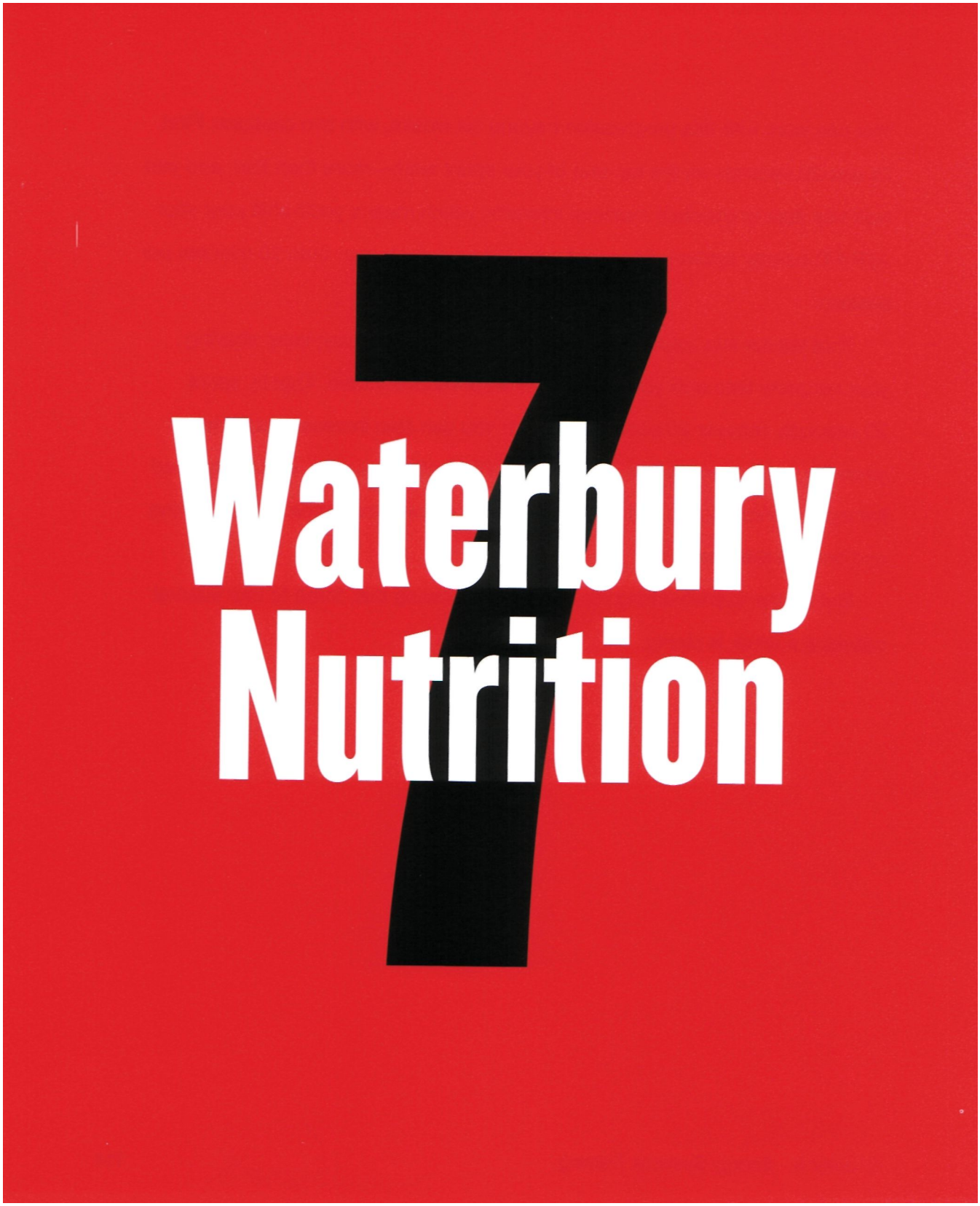
Here's a six-week interval-training plan for intermediate trainees and advanced athletes. This program will alternate between high- and low-intensity energy-systems training. Importantly, high-intensity training isn't limited to sprinting. Another excellent choice is rope jumping. For example, I'll have my intermediate-level clients jump rope as fast as they can for 15 to 20 seconds, followed by 90 seconds of walking around the room. Then they'll return to jumping rope, then walking, and so on. My advanced clients jump rope as fast as they can for 15 to 20 seconds, followed by slower rope jumping for 60 to 90 seconds. Any type of rope jumping is more taxing than walking, which is why I favor it for my advanced clients.

High-Intensity Interval Training (HUT)				
Week	Sessions per Week	Sprint Time	Recovery Time	Total Time per Session
1	2-3	15 seconds	90 seconds	10 minutes
2	2-3	15 seconds	90 seconds	12 minutes
3	2-3	20 seconds	90 seconds	12 minutes
4	2-3	20 seconds	90 seconds	14 minutes
5	3	20 seconds	80 seconds	14 minutes
6	3	20 seconds	80 seconds	16 minutes

You can work with this progression beyond six weeks, with two cautions: First, I'd use 20 seconds as the top end of your sprint work—more than that, and you won't be able to maintain maximal intensity, which means you'll shift past your ATP-PC energy system. Second, I wouldn't work for longer than 20 minutes per session.

That leaves two columns for further progression: you can keep shaving your recovery time until you get to a 1:1 work-recovery ratio. That is, sprint 20 seconds, recover 20 seconds, repeat. You can also increase your interval sessions, up to seven times a week. If you're really advanced, and really need the extra workouts, you can even do intervals twice a day, once in the morning and once in the evening.

But for the overwhelming majority of you reading this, three to four interval sessions a week is plenty.


7
Waterbury
Nutrition

Nobody can prove it, but a lot of people believe it.

"It" is the fitness-industry adage that nutrition accounts for 80 percent of your physique and performance success. You could quibble at the margins—is it really four-fifths? Or just three-fourths?—but I'll sign on with everyone else who believes it's in the right ballpark. The right nutrients at the right time will help you perform at the highest possible level, and then recover from that performance by ensuring your muscles repair themselves and come back bigger and stronger.

But that's where the agreement ends. Even the most highly credentialed experts have very different ideas about which are the "right" nutrients.

Up until the early 1990's, bodybuilders and athletes often followed a macronutrient ratio of 60/30/10—that is, 60 percent carbohydrates, 30 percent protein, 10 percent fat. The ideas behind it were simple and, unfortunately, simplistic: Carbs provide quick energy, and athletes need quick energy, so therefore three-fifths of the calories should be carbs. Protein? Well, that was crucial for muscle growth and repair, so of course athletes and bodybuilders needed a lot of it. Fat was the oddball. Everyone knew a body needs some for basic cellular repair and hormone metabolism, and everyone knew you couldn't avoid all of it no matter how hard you tried. But the consensus was that the less you had, the better you'd perform and the leaner you'd be.

Unfortunately, that anti-fat bias left athletes without some of the most nutritious foods on the planet, including salmon, lean beef, nuts and seeds, olive and flaxseed oil, and many others. If you didn't like the idea of living on chicken

and rice, you were pretty much out of luck.

The problem went beyond taste. An extremely low-fat diet leaves you with lower testosterone levels, joint pain, and compromised neural recovery from workouts and competitions.

A better eating plan was necessary, and by the mid-1990s many of us were experimenting with the opposite approach: more fat and fewer carbs. It allowed some of the healthiest foods back into our diets, supported our hormone levels, and helped with recovery. People who struggled with weight control on a high-carb diet probably found it easier to lose fat on a low-carb diet. For one thing, it's hard to overeat if you're intentionally limiting carbohydrates.

But, once again, we created some new problems. Some people just don't function well without carbohydrates. Athletes training for hours a day find they can't replenish glycogen fast enough, so they aren't able to recover completely between workouts. And some find it difficult to concentrate when their brains are forced to function with a smaller store of readily available glucose.

But there is a middle ground, which is where I've landed after more than a decade of experimenting with every imaginable nutrition program. (Some worked, while others were disastrous.) I believe most people respond well to a balanced-macronutrient diet. That is, a diet with equal amounts of calories from carbohydrates, protein, and fat.

For example, if you consume 2,400 calories each day, your caloric breakdown would look like this:

Total Daily Calories: 2,400

Carbohydrates: 800 calories (200 grams at 4 calories per gram)
Protein: 800 calories (200 grams at 4 calories per gram)
Fat: 800 calories (89 grams at 9 calories per gram)

I give my clients fairly standard advice on how to spread those calories throughout the day. Four meals is the minimum; five is better, and six is best. I consider three hours between meals to be ideal. This simple adjustment alone can help you lose fat by increasing your metabolism—just eat a sensible meal every three hours.

The exception to the three-hour rule is during and immediately after your workouts. Your body is primed at those times to take in more calories without adding fat to your waistline. Those are also the only times when it's not a good idea to eat a balance of carbs, protein, and fat. (I'll explain what I mean later in this chapter.)

A balanced-macronutrient approach doesn't work equally well with everyone. (Nothing does. I hope that's not news to you.) In general, a 33/33/33 ratio will work best for those who are trying to gain or maintain muscle while losing fat. Since that describes the majority of my clients, I usually start them off with this plan.

Some, however, don't respond well, and in my experience it's usually because they need more carbohydrates. If I detect that their performance, recovery, or cognition seem impaired, I'll increase carbohydrates. I'll usually lower their dietary fat at the same time so they don't end up eating more calories.

(The problem could also be that they aren't eating enough total calories, which I'll also address later in this chapter.)

I'll start cautiously, increasing carbs to 40 percent of their daily calories, while lowering fat and protein to 30 percent. If that sounds familiar, it's because the 40/30/30 ratio was made very famous by Barry Sears in *The Zone.*

My next step is to assess the results a few weeks down the road. How do they feel? Sharp, or sluggish? How are their workouts? Getting better, or worse? How's their body composition? Are they gaining muscle, losing fat, both, or neither?

If things still aren't going well, I'll increase the carbohydrates to 45 percent of total calories, while decreasing fat calories to 25 percent. I'll stick with 30 percent protein. So now the macronutrient ratio is 45/30/25.

I'll bump up the carbs even higher if my client clearly does better with more. For example, I might go up to a 50/30/20 macronutrient ratio. But that's my limit. I don't like going below 20 percent fat—it seems to have a negative effect on overall health, performance, and cognition. And if fat loss is a goal and we're limiting total calories, it doesn't make sense to go below 30 percent protein.

When you're doing this on your own, I recommend sticking with each ratio for at least two weeks before you decide it's not working, or not working well enough. But, aside from the two-week rule, there's no reason not to try several different ratios to find the one that works best. No ratio is intrinsically better than any other; the most important criteria are how you feel and perform.

Muscling up your diet

As I said, that's how I approach fat loss. But if you're trying to gain muscle mass as quickly as possible, I'll flip the sequence and start out with 50/30/20 for two weeks. After that, I'll measure weight, waist size, and body-fat percentage. (For body-fat measurement, I use calipers, those pinchy things that measure the thickness of your skin in a variety of spots. It's not the most accurate way to measure body fat, but if the same person uses the same calipers every time, it gives you a decent approximation of where you're starting, and a good sense of the progress you're making.) I want to see weight gain of 1-2 pounds a week without any substantial increase in waist size or body-fat percentage.

"Substantial" can mean different things with different clients, but in general I use an eighth of an inch in waist size as the maximum acceptable increase in waist size over a two-week period. That would mean a gain of three-quarters of an inch in 12 weeks, which isn't terribly bad.

Quick note about measurements: It's important to keep the variables consistent. I recommend weighing yourself and measuring your waist first thing in the morning, always using the same scale and tape measure. Over the course of a day, any number of things can affect your weight. Having something salty for lunch might trigger a temporary increase in water retention, which is meaningless overall but could change the numbers on the scale for a short time. A regular tape measure is okay for starters, but if you're serious about precision, consistency, and accuracy, I recommend the MyoTape, a relatively inexpensive tape measure ($10; www.accufitness.com).

If your waist measurement is increasing more than an eighth of an inch every two weeks, don't decrease calories. Instead, jump straight to the 33/33/33 ratio for two weeks. If the waist measurement shrinks or stays the same, then carbohydrates were the problem. Continue with the 33/33/33 ratio for as long as it works, and as long as you're able to recover between workouts, have plenty of energy, and think clearly. If any of these three elements suffers, slowly move back up the spectrum—40/30/30, 45/30/25, and so on—until you reach the point at which your brain and body are back to performing at their expected standards.

Carbohydrates, as you may have read on T-nation and elsewhere, are tricky bastards. They allow for more glycogen replenishment between workouts, which will help you build muscle by ensuring that your body will never use its own muscle mass for energy. A low-carb diet can have that effect, too, which is why that kind of diet works so well for fat loss. But a guy who's training and eating with the goal of gaining weight will probably find it difficult to eat enough food on a low-carb diet to reach that goal. Carbohydrates don't blunt your appetite the way protein and fat will. So if a naturally skinny guy, a classic "hardgainer," comes to me, as I said earlier, I'll usually start at the top of my carbohydrate scale with a 50/30/20 macronutrient ratio.

If that same guy has a specific time frame in which he wants to gain muscle size but still end up lean—if he wants to get buff for a vacation or wedding, for example—I'll use both approaches. Let's say we have 12 weeks. I'll probably follow this plan:

Weeks 1-8: 50/30/20

Weeks 9-12: 33/33/33

The number

How many calories you eat depends on your goal. Lots of complex equations exist to help you figure this out, but I like to use a pretty simple approach. First, you need to determine your percentage of body fat. Find an experienced trainer who knows how to use body-fat calipers. (The more experienced the trainer, the more accurate his measurement will be.) Once you know your body-fat percentage, it's easy to calculate your lean body mass (LBM), which is muscle and bone and everything else that isn't fat.

Let's say you weigh 200 pounds and have 20 percent body fat. That means your LBM is 80 percent of your total weight, or 160 pounds.

Plug that number into one of the following equations to figure out how many calories you should be eating:

Goal: Hypertrophy (weight gain)

LBM x 16 = daily caloric intake

Example: 160 x 16 = 2560 calories/day

Goal: Maintenance (same weight, preferably with more muscle and less fat)

LBM x 14 = daily caloric intake

Example: 160 x 14 = 2240 calories/day

Fat Loss (less weight, without a loss of muscle mass)

LBM x 12 = daily caloric intake

Example: 160 x 12 = 1920 calories/day

I can't emphasize enough that these numbers are estimates. That means they're a good starting point, but just a starting point. As I've said, it's crucial that you gauge your progress every two weeks and adjust appropriately.

For example, let's say your goal is hypertrophy. You follow the formula and eat according to your estimated caloric needs. You weigh yourself every two weeks, first thing in the morning, and also measure your waist. After two weeks, you discover that you've gained four pounds and added a quarter-inch to your waist.

So now you know the formula has overestimated your required intake.

Your strategy: Reduce your daily caloric intake by 250 calories for the next two weeks.

If you find that you've gained one or two pounds but your waist size has stayed the same, you know you've hit the sweet spot—just enough calories to meet your goal, but not so much that you overshoot and put on fat.

Now, let's suppose that, instead of gaining too much weight, you discover you haven't gained any. In that case, you want to increase your daily intake by 250 calories every two weeks until you hit a level that allows you to gain a pound or two a week without increasing your waist size more than an eighth of an inch every other week.

As a little aside, let me mention an important point about waist measurements. If your waist is getting fatter, your eating plan is not working as well as it should. However, when some people take on a serious weight-training program with exercises like deadlifts, squats, good mornings, and ab work—and this applies more to guys than women—their waists can get larger. But it isn't necessarily fat. The muscles around your waist really can get bigger without any corresponding increase in fat mass.

The muscle growth is a positive development; it means you're better able to protect your spine as you get stronger and lift ever-heavier weights. But some guys do get a bit, if you'll pardon my use of an obscure scientific term, "freaked out" over the increased waist size. There's no need to be, as I said. It just shows the need to take skinfold measurements along with the raw waist-size measurement. If the skinfolds aren't increasing, you aren't getting fatter.

Back to those increases in daily calories:

For some guys, it's going to take a lot of two-week increments to get to the point at which they're making steady gains in muscle size. If you're one of them, a super-skinny guy with a super-fast metabolism, you might want to move up faster than the recommended 250 calories every two weeks. One sign that you need to add more calories is if you're trying to gain weight but actually lose some after the first two weeks. In that case, it's okay to make a bigger jump, up to about 500 calories every two weeks.

Some guys panic when they see that they're eating 4,000 or more calories a day, but the number isn't as important as the results. If you want to gain weight

but can't, you just aren't eating enough.

Conversely, some perpetually skinny guys get so excited when they realize they're finally putting on weight that they refuse to put the brakes on if it starts to get out of hand. As I said, one to two pounds a week is the goal. Any more than that and you're almost certainly adding too much fat.

Which brings up another important point: If your ultimate goal is to be lean throughout the year, don't let yourself get fat. Intuitively simple, I know, but it's amazing how many guys go so overboard during a "bulking" phase that they spend most of the year looking like the "before" picture in a supplement ad.

In other words, I'm no fan of the classic "eat everything that isn't nailed down" weight-gain strategy, which is inevitably followed by starving yourself into oblivion to lose the excess fat. Trust me: It's a lot easier on your body and mind to gain muscle slowly, with the goal of long-term leanness rather than short-term bulk.

"Two pounds a week" is likewise an upper limit for fat loss. Unless you're obese, it's unlikely that you can lose more than two pounds of fat in a week without also losing some of your hard-earned muscle.

The difference with fat loss is that I don't recommend cutting calories below the amount suggested in the formula. Let's say you're not losing fat after two weeks at that calorie level. Instead of cutting calories, I recommend increasing your daily activity. Add another workout a week, if that's possible, or increase the volume of your current workouts. For example, if you're lifting three times a week and that's your upper limit, add a 20-minute interval session to the end of each of those workouts.

It might seem paradoxical, but fat loss is best achieved by consuming the largest amount of calories possible in order to keep your metabolism high and your workouts productive.

Many people simply don't eat enough calories when they're trying to lose fat. I'll sometimes discover, when calculating the recommended daily calories for a client who's overly fat, that he's already eating fewer calories than he should. When I have him start eating more, believe it or not, he'll lose fat. His nutrition habits had stalled his metabolism, and the first step to getting it moving again was giving him enough calories to rev it up and allow him to have productive workouts.

Of course, the problem is usually bigger than the number of calories he's eating. Poor food choices, skipped meals, eating the majority of calories late in the day—these habits all have to be changed if he wants to lose fat and keep it off.

The solution is obvious to many of you reading this: make intelligent food choices, divide calories over the course of the day so you're never starving or stuffed, and "front-load" calories so you eat more in the first two-thirds of the day than you do in the final third. A body that's well-nourished, and consistently nourished, will have no reason to store excess energy in the form of body fat. You're giving your body plenty of energy.

That's half the battle—getting your metabolism cranked up and your body out of fat-storing mode. Now you have to find a way to attack the excess fat your body has already stored.

The answer, as I'm sure you guessed, is exercise. Exercise has the opposite effect of caloric restriction, speeding up your metabolism instead of slowing it down. Combine an aggressive exercise program with a well-fed body, and you have all the elements of your metabolism working together, instead of trying to pit one or two elements against each other.

Keep retesting every two weeks to find the proper balance. When muscle gain is your goal, tinker with calories first, macronutrient ratios second. When fat loss is your goal, tinker with macronutrient ratios first, and exercise intensity and volume second. There's always an answer, if you approach the problem in a consistent and systematic way.

Food choices

There's no such thing as a magic food. Some foods are better for your health and physique than others, but it's the sum of all the foods in your diets that really matters. The fewer foods you eat, the more likely you are to be deficient in key nutrients. The other advantage to eating a wide variety of foods is that you'll enjoy eating more, and not put yourself into a craving spiral that only a large pizza with double cheese and pepperoni will satisfy. In other words, man cannot live on lean protein and broccoli alone.

Protein

Even though it shouldn't comprise more than a third of your daily calories, it's the third that you should pay the most attention to. It's also the hardest to get right.

The best protein-based foods—lean meat, fish, poultry—are relatively expensive, are tricky to prepare, and spoil easily. And when you're in a pinch and can't prepare your own meals, you end up playing nutritional roulette at a restaurant. Will the meat be high-quality? Will they prepare it carefully, or dump a bunch of salt or butter on top to make it tastier?

That's why you need to master two protein strategies: First, it's smart to shop for and prepare meat and fish in large quantities one day a week. Eat some that night, refrigerate enough for a day or two, and freeze the rest in single-meal-size containers. (Stick to glass or Pyrex containers, since plastic can ooze out some nasty stuff like estrogens.) That way you have enough for lunches that week.

Second, make sure you have a high-quality protein powder for pre- and/or post-workout shakes, and meal replacements on non-workout days. Some guidelines:

- Never choose the cheapest brand. (In my opinion, this rule works for anything in life.) Cheap protein powders are cheap for one simple reason: The manufacturing process and the ingredients used were not high-quality. If you've ever gotten an upset stomach after drinking a protein shake, or burped a lot, or started passing gas, you know the powder was a stinker. (And, subsequently, remade you in its image.)
- Different types of powders work better at different times of the day. After a workout, you want one made with pure whey protein. (I'll discuss pre- and post-workout nutrition in much greater detail later in this chapter.) But if you're using the powder as a meal replacement, you want it to also have

casein, which is slower to digest than whey. It'll have more of a satiating effect—it'll be longer before you're hungry again—and you won't have to worry about a quick surge in blood sugar.

Any whey-casein combination from a reputable company should work, although I recommend Biotest products, as you probably guessed. Biotest makes many high-quality protein powders such as Metabolic Drive.

One important quality of protein powders is their convenience. They aren't going to go bad, and you can always have a shake when there's no time to cook.

Along those lines, you should always keep eggs in your fridge. The protein is perfect for building muscle, and eggs will stay edible for weeks. Cottage cheese is another good choice, as is yogurt. Another decent option is non-fat or low-fat milk. Milk products aren't for everyone, but those who don't have a problem digesting lactose will find them a good source of high-quality protein. And some companies are responding to the lactose problem by producing milk with less of it.

Carbohydrates

In our society, we're never at a loss for readily available carbohydrates. But when I mention "readily available" carbs to my clients, they immediately think of pre-packaged foods. Not what I had in mind at all. If it comes in a bag or a box, it's probably lost its most valuable nutrients, victims of processing and flavoring. I was thinking, instead, of grabbing an apple, orange, or banana.

Here's my favorite advice regarding fruit: "Eat a rainbow." The primary colors

of a rainbow are red, orange, yellow, green, blue, and purple. (My apologies to Sir Isaac Newton for omitting indigo from the list.) I recommend choosing a fruit source of each color, and balancing them throughout the week. You don't need to eat fruit with every meal, but when you do, go through the complete cycle. For instance, let's say you eat five meals each day. If you have fruit with meals 1, 2, and 3, you could eat a red, orange, and yellow fruit the first day. The next day, try a green, blue, and purple fruit in your first three meals. In two days, you've hit all six.

My favorites:

Red: apples and strawberries

Orange: oranges and peaches

Yellow: pineapples and bananas

Green: kiwi and green grapes

Blue: blueberries

Purple: prunes and blackberries

You can also try the rainbow rule for vegetables, although it's not quite as practical. (Blue and purple are the tough ones.) But no matter what, make sure you get plenty of greens. They're the most alkaline in nature, and that's important because an excess of acid (technically, low-grade metabolic acidosis) is thought to not only be dangerous to your health, but to affect a majority of Americans. (See the sidebar, "Are You an Alky?")

The bulk of your carbohydrate calories are going to come from starches. Slow-cooked oatmeal is a great choice for breakfast, and rye bread and sweet

potatoes are also healthy and filling. If you're ever faced with a choice of starches—if you're ordering in a restaurant, for example—go for the darkest. So it's rye bread over white, and sweet potatoes over white.

Finally, consider beans, which have some protein along with a lot of fiber. The darkness rule still applies, which means you want to choose black beans over brown.

Fats

Fat used to be a no-no for bodybuilders as well as health-conscious people in general. And you still meet people who believe there must be something wrong with it if people spent so many years and so much energy saying such bad things about it.

Today, of course, we know that healthy fats can help you get leaner, stronger, and healthier.

Ideally, the majority of your fat intake should be derived from monounsaturated and polyunsaturated sources. In the first category you'll find olive and canola oil, along with nuts and seeds. Polyunsaturated fats fall into two general classifications: omega-3 (including fish and fish oil, and flaxseeds and flaxseed oil) and omega-6 (including vegetable oils and products like mayonnaise, which is made from soybean oil). Omega-3 fats are by far the better choice, since they increase your metabolism and help maintain a healthy blood-lipid profile.

Saturated fat has been linked to a variety of health problems, fairly or unfairly.

(Saturated fats in processed meats, such as sausage and bacon, seem to be more dangerous than those in unprocessed meat.) You need some saturated fats for the integrity of your cell structures, but you never need to seek it out. If you eat a lot of lean meat and poultry, you'll get plenty of saturated fat even if you're trying to avoid it. This is especially true if you eat in restaurants on a regular basis.

Water

Finally, don't forget about water. I recommend a bare minimum of one-half ounce per pound of lean body mass per day. If you have 160 pounds of lean mass, that means 80 ounces of water, or 10 cups. (Or five pints, or two and a half quarts.) If your urine isn't clear, you aren't drinking enough water.

But… what about very-low-carb eating plans?

Due to the success of Dr. Atkins, and all of the low-carb eating plans that have come into vogue, there's been a lot of talk about eating significantly fewer carbs to lose fat. Indeed, you'll notice an immediate loss in pounds on your scale if you drop virtually all carbs from your diet. That's because carbs are stored with water. When carbs are limited, you hold less water. And since your body is 65 to 70 percent water, it's easy to see why you can quickly drop pounds.

But I'm getting ahead of myself. Let's start with something basic: What exactly are we talking about when we describe a diet as "low-carb"?

I define low carb as eating fewer than 50 grams of carbs per day. (Simplistic?

Yes, especially if you're offering the same definition for a 120-pound female and a 300-pound male. But it gives us a starting point.) In all my years of working with people to transform their bodies, I've come to this conclusion about low-carb eating plans: They can help you lose fat, but shouldn't be considered long-term solutions.

My preferred method to help people lose fat is to put them on an eating plan that has a caloric balance of carbs, protein, and fat—the 33/33/33 plan that I described earlier. I like this plan because it's pseudo-low-carb, but still allows you to get the nutrients you can only get from the healthiest carb sources. But some people don't respond well to the pseudo-low-carb plan, and need even fewer carbs to get their fat-burning mechanisms up and running. The likely culprit is insulin.

I'm convinced that insulin control is the key to losing fat. Insulin, a hormone that, among other tasks, signals your body to store nutrients, is released in response to eating. If it wasn't released, your body wouldn't know what to do with the food moving through your digestive tract and into your bloodstream. Some bodies are more sensitive to insulin than others, and those bodies tend to stay the leanest. Insulin sensitivity changes throughout your life.

When you were a teenager, you could probably eat a super-sized meal at McDonald's and follow it up with ice cream without gaining any fat. Among the many reasons for that is the fact that a younger body tends to be more efficient at handling the rush of blood sugar that accompanies a meal loaded with fast-digesting carbohydrates. But as you age, and your body becomes less sensitive

to insulin, your body tends to produce more of the storage hormone in response to carb-rich meals. The blood sugar dumped into your bloodstream needs a place to go, which is why your body produces more insulin, but the insulin receptors are less efficient. The combination of high blood sugar and high insulin with low insulin sensitivity sets you up for a long list of negative health outcomes, starting with more body fat.

So the answer seems rather simple, doesn't it? To lose fat, you simply need to cut carbs, which lowers blood sugar, which lowers insulin, which ultimately makes your body more sensitive to insulin, and thus more sensitive to carbs and the amounts of blood sugar they produce.

Another advantage to a low-carb eating plan is that it will force your body to use more fat for energy, including your stored fat. That's a consequence of having less sugar in your bloodstream, denying your body its easiest source of energy.

But your choice may not be as simple as that.

It's virtually impossible to get all the nutrients you need when you limit carbs to less than 50 grams per day. Important nutrients such as potassium, magnesium, and phytochemicals (those friendly little guys who help stave off cancer) are hard to come by with limited carbs.

So don't think of low-carb diets as a life-long solution to keeping six-pack abdominals or rock-hard glutes. Instead, think of them as a temporary solution to reset your insulin sensitivity while burning some extra fat in the process.

If you don't respond well to the 33/33/33 eating plan, give the following low-

carb plan a try. But I must give four more caveats:

First, you should not follow this plan for more than one month before returning to the 33/33/33 plan.

Second, don't follow this plan more than twice each year. (And no, you can't do the two months back-to-back. Separate each low-carb month with at least three months of a 33/33/33 plan.)

Third, you must take a multi-vitamin/mineral supplement each day to make up for lost nutrients. There are many good ones on the market, such as Genuine Health's multi+ (shop.genuinehealth.com).

Finally, give yourself a cheat meal once a week in which you eat anything and everything you want-fried shrimp, ice cream, baked potato with butter… it's all fair game. This cheat meal will give you a mental break and provide a nice metabolic boost.

One-month low-carb fat-loss plan

Carbs: 50 grams per day in the form of vegetables and 2 servings of Greens+ (a supplement described in the next section).

Protein: 1.25 grams per pound of LBM in the form of whole food sources (no protein powders except during and immediately after your workouts).

Fat: 0.5 gram per pound of LBM (6 to 12 grams of the fat should be from fish oil supplements as outlined in the next section).

Nutritional Supplements

I've outlined many different macronutrient combinations for various goals in this chapter. But it's the totality of your diet that allows you to reach those goals, or causes you to miss them. Without a good all-around eating plan, no supplement in the world will help.

However, once you have a solid plan in place, nutritional supplements can play an important role. I've experimented with virtually every supplement known to man and 1 can say this with utmost certainty: Very few work. The ones I'm about to describe do, if you use them properly.

Pre- and post-workout nutrition

What you eat directly before a workout can affect your results in a big way. It doesn't matter if your goal is fat loss, muscle gain, or something in between; if your muscles are starved, you won't achieve that goal. Your performance in the gym will tank.

I know that goes against the notion that it's best to train on an empty stomach. The idea, which goes in and out of fashion but always has its advocates, is that eating any type of food before training will impair fat burning. And it makes sense, in theory: If your stomach is empty, your body will use your fat stores for energy. Put food in your stomach, and you'll use that for energy instead of fat. A lot of carbohydrates, in particular, will cause an insulin response, which puts your body into a fat-storage mode—the opposite of what you want. And eating fat before a workout has been shown to blunt the

release of growth hormone, which is a potent fat-fighting and muscle-building tool.

There's one big problem with the empty-stomach hypothesis: Our bodies are built for survival, and one mechanism of survival is holding onto fat stores during times of starvation or crisis. If your body thinks it's starving, it hangs onto the fat as long as possible. So what does it use for energy, if there's nothing in your stomach and only a small amount of glycogen available? The protein in your muscles. It's not easy to use protein for energy, but your body will resort to that if it thinks it needs to preserve fat.

There's an easy way to avoid burning off your hard-earned muscle: Drink a protein shake before you train. If your body is going to use any protein for energy, it'll have plenty circulating around.

For fat loss, I recommend 20 to 35 grams of protein directly before training. This should come from an easily digestible protein powder such as whey, or a combination of whey and casein. Biotest (t-nation.com) makes an excellent whey protein, which fits the bill perfectly. The idea is to provide just enough amino acids to keep your body from using muscle for fuel. Mix a scoop with water and drink it right before you train.

Here are the pre-workout dosages I recommend for fat loss, based on your lean body mass (LBM):

Pre-workout, fat loss:

100-150 lbs. LBM: 20g protein

150-200 lbs. LBM: 25g protein

200-250 lbs. LBM: 30g protein

250+ lbs. LBM: 35g protein

For muscle growth, you want some carbs and protein right before the workout. Protein will offset muscle loss from energy demands, and carbs will supply fuel for glycogen replenishment. In this case, the release of insulin from the carbs will help shuttle the nutrients into your muscles, giving you faster energy for a more productive workout. You still don't want fat in your pre-workout shake, since there's no reason to risk blunting the surge of growth hormone. The best product I've found for this purpose is Biotest's Surge. It has an ideal two-to-one ratio of carbs to protein, without any fat. You should consume one-half serving, mixed in water, anywhere from five to 20 minutes before your workout. The other option—if your empty stomach can't handle the initial rush of nutrients—is to sip on the drink throughout your workout.

If you choose another supplement, you still want to aim for that two-to-one ratio of carbs and protein found in Surge. If Surge isn't an option, you can make your own drink. The carbs should be in the form of maltodextrin—a sugar that hits your bloodstream quickly—and the protein should be whey.

Here are the pre-workout dosages I recommend for hypertrophy:

Pre-workout, hypertrophy:

100-150 lbs. LBM: 40g carbs, 20g protein

150-200 lbs. LBM: 50g carbs, 25g protein

200-250 lbs. LBM: 60g carbs, 30g protein

250+ lbs. LBM: 70g carbs, 35g protein

My post-workout recommendations differ slightly from my pre-workout advice. The reason: insulin. Insulin helps accelerate recovery by shuttling carbs and protein into your muscles. That's good for hypertrophy, but insulin production should be minimized when you're trying to burn fat. Since there are no carbs in the post-workout drink for fat loss, I want you to add glutamine and creatine, since both can accelerate recovery without releasing too much insulin.

Here are the post-workout dosages I recommend for fat loss:

Post-workout, fat loss:

100-150 lbs. LBM: 30g protein, 10g glutamine, 3g creatine

150-200 lbs. LBM: 40g protein, 15g glutamine, 5g creatine

200-250 lbs. LBM: 50g protein, 20g glutamine, 8g creatine

250+ lbs. LBM: 60g protein, 25g glutamine, 10g creatine

If your goal is to gain as much muscle as possible, you should repeat the carb-protein drink that you had at the onset of your workout—you still need insulin to help shuttle the nutrients into your muscles, this time for growth and

repair rather than immediate energy. I also recommend adding creatine to your post-workout shake. I prefer micronized creatine, but some respond well to basic powdered creatine.

Creatine is one of the few supplements that actually works, and it works damned well. In fact, current research is demonstrating that it might actually be a "smart drug." Yes, creatine appears to increase mental performance. Not only that, but many neurologists are using creatine to treat patients with muscle-wasting diseases.

Simply adding creatine to your daily regimen can augment your mental performance, as well as your gym performance. Everyone should consume three to five grams of creatine on non-training days, mixed in water or in a liquid meal replacement that contains minimal fat. On non-training days, my clients have creatine when they first wake up; they then wait 20 to 30 minutes for their first meal. On training days, those of you who have more than 200 pounds of lean body mass will take more.

As you can see, the recommendation for post-workout creatine is based on lean body mass.

Post-workout, hypertrophy:

100-150 lbs. LBM: 40g carbs, 20g protein, 3g creatine

150-200 lbs. LBM: 50g carbs, 25g protein, 5g creatine

200-250 lbs. LBM: 60g carbs, 30g protein, 8g creatine

250+ lbs. LBM: 70g carbs, 35g protein, 10g creatine

There's no rule that says you have to limit yourself to one post-workout shake. The usual recommendation is that you have one shake within 30 minutes of the end of your workout, and then a regular meal some time later. But I've seen great results with a second post-workout shake 45 minutes to an hour after the first.

The second post-workout feeding also offers an opportunity for a little "sweet tooth" indulgence. If you're trying to gain as much mass as possible, you could take advantage of this time by eating a sugary cereal and/or bagel.

With the cereal option, choose one that's low in fiber and has a mixture of simple and complex carbs. An ideal choice is Frosted Cheerios, but there are many options. The keys are to read the labels and do the math, so you end up with the right proportion of carbs and protein for your lean body mass, as detailed previously.

Let's say you have 180 pounds of lean body mass and want to add more muscle. You need 50 grams of carbs and 25 grams of protein. A cup of Frosted Cheerios (yes, you do need to measure) gives you 25 grams of carbs, with negligible amounts of fat and protein. A cup of skim milk gives you about 13 grams of carbs and eight grams of protein. So you need to add about 12 grams of carbs and 17 grams of protein. The protein is easy—a scoop of most brands is about 20 grams. You can add a little more cereal to make up the rest of the carbs. It should all mix nicely together.

If you go the bagel route, you need to get your protein separately—mix it up with water and drink it, while eating the bagel with whatever nonfat topping you

prefer. Again, you have to look at the label, since different brands and types of bagels have different nutritional values.

With either option, avoid fat—use skim milk with the cereal, and jam or nonfat cream cheese with the bagel. Fat will blunt the insulin response, which defeats your purpose. Also make sure to add in the carbs from the topping when you add up the totals.

No matter your goal, I recommend that you wait no more than three hours after your post-workout shake (or shakes) before you have a regular meal.

Fish Oils

If you aren't currently taking some type of omega-3 fatty acids in supplemental form, I want you to start. Now. They'll enhance neural recovery and improve your blood-lipid profile. (That includes your cholesterol and triglyceride levels, as well as the ratio of "good" cholesterol to "bad.")

Fish oils are the easiest to use. They've been shown to increase your metabolism, along with the benefits you get from all omega-3 fats. I suggest six to twelve grams every day, divided into three dosages that should be taken with meals (two to four grams with each meal). Biotest makes an excellent fish oil product, Flameout, which has additional anti-inflammatory compounds added to it. Another great product is Carlson's lemon flavored fish oil.

Here's a breakdown offish-oil dosages based on your LBM.

Fish Oil Recommendations (per day):

100-150 lbs. LBM:6g

150-200 lbs. LBM:8g

200-250 lbs. LBM: 10g

250+ lbs. LBM: 12g

Branched-chain amino acids (BCAA)

Branched chain amino acids consist of three essential amino acids: L-leucine, L-isoleucine and L-valine. What makes these amino acids so special is that they are preferentially taken up by your muscles. That's good for two reasons.

First, BCAAs will help you build more muscle when you're bulking. Second, they'll help you preserve muscle while you're trying to lose fat.

Here's how I suggest you use them.

BCAAs for hypertrophy (per day):

100-150 lbs. LBM: 12g (3g taken 4 times per day between meals).

150-200 lbs. LBM: 16g (4g taken 4 times per day between meals).

200-250 lbs. LBM: 20g (5g taken 4 times per day between meals).

250+ lbs. LBM: 24g (6g taken 4 times per day between meals).

For fat loss, I recommend higher dosages. That's because fat-loss plans (even those that are well-designed) can consume some of your muscle mass. That's a risk you take anytime you eat fewer calories than normal.

Here's my recommendation.

BCAAs for fat loss (per day):

100-150 lbs. LBM: 20g (5g taken 4 times per day between meals).

150-200 lbs. LBM: 24g (6g taken 4 times per day between meals).

200-250 lbs. LBM: 28g (7g taken 4 times per day between meals).

250+ lbs. LBM: 32g (8g taken 4 times per day between meals).

Are You an Alky?

We're constantly inundated with acid-forming substances in our diet and environment. This often creates an excessive acid load, called "low-grade metabolic acidosis," which your body must buffer in order to maintain a tight pH range. The problem is that buffering is achieved by stealing calcium from bones and glutamine from muscles (3, 4). So if your body is excessively acidic, you'll probably decrease bone density and lose muscle. Metabolic acidosis has also been linked to decreased IGF-1 production, growth-hormone resistance, mild hypothyroidism, and hypercortisolemia (5, 6).

Generally, protein sources such as beef, chicken, fish, and cheese create

an acid load in your body. Obviously, these high-quality protein sources should be an integral part of your diet. So rather than avoid them, they should be neutralized with alkaline foods. The most alkaline foods are vegetables and fruit, while fat is basically neutral. Your mother was right when she told you to eat your fruits and vegetables. (Perhaps she was moonlighting as an endocrinologist?)

But she's not the only one who was ahead of the science. So was that famous sailor with the freakish forearms. Yes, I'm talking about Popeye. You see, spinach is one of the most alkaline foods in nature. I suggest you make it a staple in your diet. Furthermore, green vegetables rank among the most alkaline foods. So if spinach isn't available, choose any green vegetable with your meals.

For the times when you can't stop to cook, there's an excellent supplement on the market called Greens+. It's like taking a boatload of green vegetables, wheatgrass, and a host of other alkaline nutrients that have been ground up into powder form. My clients and I take two full servings every day, mixed in a protein shake or water.

If you feel lethargic at a certain time of day (mid-afternoon, for me), I recommend one serving of Greens+ mixed in water. If it gives you a boost in energy within a few minutes, you know it's working. Greens+ is also available in pill or bar form.

Eating real fruits and vegetables is still your best strategy, but I think there's a good argument for adding Greens+ as a supplement.

Thanks to my colleague, Dr. John Berardi, for turning me on to this excellent product.

Chapter 7 Waterbury Nutrition

8 Fatigue, and How to Beat It

The term "overtraining" has an interesting

history in the fitness industry. Demonstrably, most people in the U.S., if not the entire world, are undertrained. That is, they do less exercise than they need for health and weight control. But all of a sudden—and it really did seem to come from nowhere—there was this idea that a significant number of people are, in fact, overtrained.

And, when you narrow down the universe of potentially "overtrained" people to the percentage who exercise with some intensity and purpose, the idea has some merit. There really are people who go beyond their ability to recover from one workout to the next. Unfortunately, the subject is rarely discussed in a way that would be useful to the people who are actually overtrained, or at risk of overtraining.

See, most of the time, the word has a very narrow meaning: too much exercise, or exercise at too high an intensity, or some combination. But I think the issue is broader than that. What we're really talking about is fatigue, and fatigue management. And fatigue can come from any number of sources.

Fatigue is your biggest nemesis. It doesn't matter what your training goal might be. Too much fatigue will prevent you from reaching it. But, since fatigue is part of any program, it can never be eliminated. Therefore, it must be controlled. Every aspect of your recovery routine—what you do when you're not training—needs to work to help you neutralize your enemy.

First, a definition: Fatigue represents a *temporary decrease in performance.*

Remember, the human body wants more than anything to maintain homeostasis—to stay the same. Fatigue accumulates in response to a demanding workout, and your body responds by decreasing your ability to perform at the same level in order to protect your system and allow for recovery.

Central casting

There are two primary types of fatigue: central and peripheral. These correspond to your two nervous systems. Your central nervous system (CNS) includes your brain and spinal cord. Their importance is signaled by the fact your body protects them with bone. Your peripheral system involves the nerves in your muscles and organs that actually make things work. Think of them as the soldiers in an army, exposed to more of the projectiles and toxins that come along, while the brain and spinal cord—the generals and support personnel—stay within their hardened bunkers.

Central fatigue represents a decreased rate of nerve transmission from the brain and spinal cord. What causes this decrease is speculative, but it seems to work on multiple levels. Within the higher centers of the nervous system (your brain), fatigue often coincides with a lack of motivation. There are certainly other factors that play a role in central fatigue, such as a decreased ability to concentrate, but I've found that motivation trumps all other elements. In other words, if you remain motivated, you can be pretty sure you don't have excessive central fatigue—assuming, of course, that your performance in the gym is up to your normal standards. However, when your motivation slips, figure that central

fatigue is involved.

Let's say, though, that your motivation (or, for that matter, your concentration) aren't demonstrably lower than normal—you're a lazy nimrod most of the time. (Kidding!) But you still sense that something's off.

One quick and simple way to see if central fatigue is the culprit is the vertical-jump test. This only works, of course, if you know what your VJ is when you're not fatigued. It's a good idea to know this for future reference. If you don't have access to a training center that has a testing apparatus, you can do this simple test:

Find a bare wall and some chalk that's a different color from the wall—white chalk on red brick, for example. Rub some chalk on the middle finger of your dominant hand. If you're right handed, you'll stand close to a wall with your right shoulder next to the wall. Reach as high as you can, and make a mark on the wall. Put fresh chalk on your finger, squat down, and jump up as high as possible and touch the wall at the highest point you can reach. Rest two minutes and repeat.

Now measure the distance between the highest and lowest marks. That's your baseline VJ, which you can use to see if you've improved from a future training program, or if you're suffering central fatigue. (You can make it even simpler and measure from the floor to the height of your best jump, if you have a tape measure that's long enough.)

It's important to keep the testing variables as consistent as possible. Be sure you're wearing the same type of shoes (even if you no longer have the shoes you

used for the baseline test), and be sure your stance is always the same with each attempt—you'll skew the results if you establish your baseline with your feet 18 inches apart and then re-test yourself with your feet 24 inches apart. I'll measure and record the distance between my clients' feet when they do VJ tests.

Now, let's get back to the reason I'm talking about all this: If your VJ when you feel off your game is less than your baseline number, it's safe to assume your nerve-transmission rates have diminished, and your body has central fatigue.

Why is the VJ test a good indicator of central fatigue? Think back to Chapter 5, when I showed you a chart depicting the relationship between speed and force production. Basically, the faster your speed, the more force you can produce. Your ability to produce maximal force depends on your nervous system. A fatigued nervous system won't be able to recruit your motor units as quickly as it can when it's tanned and rested. It just can't send nerve transmissions fast enough to get all the boys working together on a single event, like a jump.

You don't need a dramatic decrease in VJ height to figure you're fatigued. If it's not within an inch of your baseline jump, something's wrong.

I should add here that I don't base this test on any published research. It's based on data I compiled from my own clients. In my experience, if a client isn't able to reach his normal VJ height, his subsequent workouts will be sub-par as well.

An obvious question arises, one you've probably been asking throughout this chapter: What about the actual muscles? You know from experience that if you do heavy squats on Monday, your VJ might suck on Tuesday, and maybe on

Wednesday, too.

Is that central fatigue, or something else that happens on the periphery as a direct effect of a strenuous workout?

The short answer is, nobody knows. You see, fatigue is one of the most ambiguous elements in neuroscience. Heck, neuroscientists don't even know how information is stored, retrieved, and processed in your brain, much less understand an issue as complex and variable as fatigue.

In my view, it's highly likely that your CNS causes fatigue, and I mean any kind of fatigue. That's why I find it puzzling that more resources haven't been allocated to study such a ubiquitous problem.

That said, "highly likely" isn't the same thing as "case closed." So for me to say that a diminished CNS is the sole source of a poor VJ would be abuse of the known science. It's possible that peripheral fatigue could be playing just as big a role. For instance, the nerve transmissions in your CNS might be fully recovered, but the transmission between your motor neurons and muscles might still be impaired, thus causing your VJ to decrease.

Nevertheless, I consider the VJ test to be a decent measure of whether or not your body is functioning in an optimal state. If your VJ is up to par, you know there's nothing wrong in either the CNS or PNS. But if your VJ is off, you know something is wrong, and that's more important than knowing exactly where the problem originates.

So let's talk about peripheral fatigue—performance declines caused by localized phenomena. You know what it feels like to have sore and stiff muscles

for days after a tougher-than-usual workout. It's easy to extrapolate that the nerves attached to those muscles would be fried, as well.

But whatever the culprit may be, there are ways to minimize and control both types of fatigue. Doing so will allow you to train at a higher level, and get closer to the results you want.

Damage control

Research and experience have shown me that these are the best anti-fatigue tools you possess:

Get enough sleep

If you aren't getting adequate sleep each day, you're cheating yourself, limiting your shot at success. And I use the term "success" in its broadest possible meaning. A loss of only one hour each night is enough to impair cognition and motor skills. Considering that many of us lose two to three hours a night, for months or years on end, you can see how we're putting a glass ceiling over our heads.

So what is it about sleep that's so important? Hormones. Virtually all the good ones—the ones that help you stay lean, strong, and healthy—diminish when you're short on sleep. But it gets worse: While the good hormones are reduced by lost sleep, the bad ones increase. Just to pick one, your levels of Cortisol are almost certainly too high if you lose sleep regularly. Current research shows a pretty strong link between sleep loss and obesity. Just an hour or two of lost

sleep a night can do a number on your body composition and endocrine system

Eight hours of sleep is the minimum for most of us, and nine hours is even better for optimal health and performance.

I often get approached by overwrought and overwhelmed parents and executives who tell me that eight hours a night just isn't possible. I understand, but the recommendation stands. On the bright side, you don't have to get eight *continuous* hours of sleep. You simply need to get eight total hours per 24-hour period. If your life prevents more than six or seven hours of sleep at night, find time to get a nap during the day, if not two. With some ingenuity, you can find a way. I've worked with the busiest of the busy, and they've all found ways to fit naps into their daily schedule.

The best time to nap is right after your workout. When you get home from the gym, have your post-workout drink and immediately lie down for 20 and 30 minutes. There's no need to fall into deep sleep; 20 to 30 minutes is enough to induce "twilight sleep," which will boost your growth-hormone levels and accelerate neural and muscular recovery. In fact, a post-workout nap is one of the most effective recovery aids I've ever used.

But if you can't nap right after your workout, any time will do the trick. A daily nap will help you become leaner, stronger, and infinitely more pleasant to be around.

Some say that you can't make up for lost sleep. Whether or not you can is a moot point; your goal, always, is to get as much sleep as possible. To prove my point, try this experiment, if you can: For the next seven days, try to get two

extra hours of sleep each 24 hours. So if you normally get seven, go for nine. If you're accustomed to a full eight hours, try to get 10. If it improves your mood, attention span, and performance in the gym, you needed it, and you make that your goal each and every day. I'm a big advocate of getting 10 to 12 hours of sleep whenever possible. Approach each day as if you're sleep-deprived and need to catch up. Even if it's impossible to make up sleep that's lost, you at least guarantee you won't have any lost sleep to make up going forward.

Avoid training to failure on a regular basis

Despite its awful name, "failure training" is popular in the hypertrophy-seeking community. At its extreme—called "high-intensity training," or HIT—this type of lifting usually involves taking one set of each exercise to absolute failure, followed by an extended period of recovery—up to seven days. So if you were using HIT for your lower body, and your first exercise was squats, you might do a warm-up set, then take your only work set of squats to absolute failure. That is, you'd go until you couldn't possibly lift the load one more time. Then you'd do single sets of the other exercises in your workout—leg presses, leg extensions, leg curls, whatever. You probably wouldn't do any more warm-ups, and you'd take each work set to that same point of absolute failure.

Put simply, the idea is to go all-out on each exercise, with the promise that your maximum intensity will result in maximum gains. As you can imagine, this type of training generates super-high levels of delayed-onset muscle soreness (DOMS). These two factors—the feeling that you're doing absolutely everything

you can to make gains, and the DOMS that suggests it worked—are the biggest selling points of the system.

My first problem with the HIT philosophy is that it's based on a false premise. You don't need mind-blowing intensity to make your muscles grow. Here's what Per Tesch, Ph.D., author of a chapter called "Training for Bodybuilding" in the incredible text *Strength and Power in Sport,* had to say about failure training:

"It is a common belief among bodybuilders that muscle failure should terminate each set in order to optimize the beneficial effects of strength training. Statements like 'No pain—no gain' reflects that widespread opinion. ... This may very well be true but there is no proof of this hypothesis. Neither is it clear what mechanism associated with contraction failure would relate to increased protein synthesis, which is the ultimate goal of bodybuilders." (7)

Translating from Ph.D.-speak, Dr. Tesch is saying that there's no basis for the idea that something magical happens when you exhaust a muscle to the point where it can't perform another contraction.

Second, there's no evidence that excruciating amounts of DOMS mean that muscles are growing more than they would following a workout that didn't generate as much post-workout pain. A squat workout that leaves you limping for five days may even have the opposite effect, and be less effective than one that didn't induce so much pain and suffering. No one knows.

I've experimented with failure-training methods since the beginning of my career. I've never seen a client make enough progress on HIT-type systems to justify their use on any regular basis. And I'm not convinced failure training is

ever necessary.

But before I get into the negatives of failure training, let me first explain why some lifters do indeed get some initial benefits from it:

1. *Change in parameters:* Change is good. If you've been using the same workout configurations for months or years—same sets, same reps, same muscles trained on the same days—virtually any shift in parameters should produce noticeable improvements in strength and muscle size.
2. *High-threshold motor-unit recruitment:* As I explained in Chapter 5, if you want the best possible gains in strength and size, you must recruit the largest motor units. Failure training is one way to get there, assuming you're working with a weight that's heavy enough to call those motor units into action.
3. *Detraining:* As I said earlier in this chapter, some lifters really are overtrained; they've been using too much exercise volume for too long. Sometimes, HIT hits the spot for guys who're suffering central fatigue and find their motivation sinking. For that guy, the idea of a workout that's over in 20 to 30 minutes sounds pretty good. So does the idea of taking a full week of recovery for the muscles you've worked. You often hear guys rave about the gains they made when they shifted to HIT after months or years of mediocre gains on high-volume programs. In this case, these guys needed to back off from the volume and give their muscles a chance to recover fully.

Of course, those improvements usually prove to be temporary and limited, as HIT-ites often discover they've just traded one ill-conceived training system for another. The biggest problem is that, since failure training usually requires extremely low training volumes and extremely long recovery periods in between workouts, your overall fitness levels quickly decrease.

Think of it as akin to dieting: You know that if you stop eating for two days, you'll lose weight. But you probably know you'll pay a steep price, since your body responds to starvation by shutting down your metabolism. Thus, in your quest to lose fat, you train your body to hold onto it.

Lifters on failure-training programs will see similar drops in any number of fitness parameters. Muscular endurance? Gone. Resting metabolic rate? Downshifted. Strength? Noticeable decline. Power? HIT-type training sucks it right out of you. Muscle mass? It might not decline as quickly, but my guess is that you'll feel as if it has, since the low training volume combined with slower metabolic rate will allow your body to store more fat.

But this isn't a chapter about strength, power, metabolism, or even hypertrophy, in the prescriptive sense. It's about fatigue, and that's where HIT is doubly dangerous to your goals. Even while you're lowering your exercise volume to sub-optimal levels, you're jacking up the amount of fatigue you induce. You'll feel it most unambiguously in your peripheral system, in the form of excessive DOMS. But it also hits your central nervous system (CNS).

I've seen trainees start to exhibit signs of neural stress within a few weeks on HIT-type programs. I'll see decreased motivation, lack of appetite, disrupted

sleeping patterns, irritability, or some combination of two or more. (You'd better believe you get irritable if you aren't sleeping well.) The central fatigue that comes from one all-out effort after another and another and another simply overwhelms the CNS. There may be plenty of time for muscles to recover—too much, in fact—but the CNS stress of HIT training is overwhelming. Your subpar fitness levels from infrequent HIT training set you up for massive stress and fatigue when you perform workouts with mind-blowing intensity—the two simply don't go together. It's akin to lying on the couch all week, running in a dead sprint for 20 minutes, then returning to the couch. I've tried to make the point throughout this book that your workout program should be designed in a way that you get frequent stimuli to which your body must adapt, which means you need to change those stimuli frequently. Infrequent but never-changing stimuli represent the opposite of a good program.

Have you ever been completely stressed-out for an entire day? I bet you have. (I know I have!) At the end of the day, you probably felt like you ran a marathon even though you might not have exercised at all. That's where you could end up if you follow failure-training programs to the letter for weeks on end.

Now, having said all that, I admit that I do sometimes use or recommend failure-training workouts. If you have the choice between not working out at all, or making the most of a very limited window of time, I might recommend a workout of squats, pull-ups, shoulder presses, dips, and rows, all performed to failure. It's a quick and sure way to train your major muscle groups. It's not

ideal, and you should only consider it if the alternative is no workout at all.

Sometimes I'll recommend body-weight exercises for athletes who need to develop their overall fitness levels. I might have them perform a very high number of repetitions for, say, body-weight squats (maybe 50 to 100 reps per set). Since there's no external load, the overall stress to your CNS is much lower, which means you could work to failure without causing excessive fatigue.

I should also note that not all HIT workouts are based on one set to failure of every exercise, followed by a week of recovery. Some now advocate more progressive versions of HIT, with more frequent workouts.

One last word about failure training: When I disparage it, I don't mean that your workouts should be easy or less than exhausting. Successful strength and hypertrophy training involves large loads and fast contractions in order to recruit the greatest number of motor units, from smallest to largest. It's important that you make your workouts hard. It's good to *approach* failure—that is, to get to the point at which you have to strain to get your last repetition or two. But going past that, to complete failure, or even beyond (with forced reps), is unnecessary and often counterproductive.

As the wisdom goes: Train to strain, not to fail.

Get enough food: I covered this in previous chapters, so I won't belabor it here. But food is every bit as important to limiting fatigue as sleep and smart program design. Your body needs protein to repair muscle tissue, and carbs and fat to replace the energy that you've burned off.

Posture

Early in my career, I was fortunate to work directly with physical therapists at Northwestern Hospital's Center for Spine, Sports, and Occupational Rehabilitation in Chicago. It was there that I learned the importance of proper posture for health and performance.

But since then I've also learned something else, something few performance experts ever talk about: Correcting poor posture will diminish fatigue. I mentioned earlier in this chapter that a fatigued nervous system will make you feel ... well, fatigued. So if you improve your nervous system's performance by correcting your postural problems, you'll recover more quickly. Not only that, but you'll feel more energetic because your muscles and organs will have uninterrupted input from your nerves.

I know that's a big claim, but think about it this way: Everything you need your body to do is dependent on your posture. That includes the things you never think about, such as the function of your internal organs. Your organs are innervated by nerves that branch off from your spinal cord, so if you compress those nerves because of bad posture, your organs will suffer.

All this is aside from the biggest problem with bad posture—it decreases your performance. By that, I mean both physical and mental performance. I probably don't need to spend much time convincing you of the many ways that poor posture will impair your physical performance. But it also drains you mentally. Neurologists have demonstrated the links between good posture and feelings of well-being.

No one can say if postural flaws compromise the nerves that help elevate your mood, or if poor posture sends signals to your brain suggesting you aren't happy. Either way, there's an important lesson: Improve your posture and a healthier mindset will follow.

When we talk about posture, technically, we're talking about the curvature of your spine and the position of your joints relative to the rest of your body. When we talk about correcting posture, we're talking about a combination of resistance training, stretching, and more posture-specific drills.

In this discussion, I want to focus on the two biggest postural problems I see with my clients: kyphosis and lordosis. I know I've hit you with a lot of technical terminology in this book, and I hesitate to bring in two more terms that most people have trouble keeping straight. (Sort of like "pronation" and "supination"—if you aren't a doctor or exercise professional, you've probably seen those words hundreds of times and still can't remember which is which, if you ever knew what they mean in the first place.)

Here's an easy way to remember: Lordosis is excess curvature of your lower back. Well, technically, it's an anterior pelvic tilt, but the result is the same: Your lower back has too much arch, which pushes your belly forward. Think of Henry VIII, with that huge, regal belly. So "lordosis" is something an important person might want to have had as a way of "lording" it over his subjects, back in the days before anyone could afford enough food to get a big, protruding belly. Of course, you don't have to be fat to have lordosis; it's just as easy for a lean athlete to have it. I only use the protruding-belly image as a visual cue to remember the

word.

Kyphosis is defined as an excessive posterior curvature of the spine. It's easy to remember if you think of a hunchback. (Sorry, I can't think of a word that links any part of "kyphosis" with "hunchback.") As more Americans spend more time hunched forward at their computers, I see more people with this problem.

There are two primary types of kyphosis: *mobile* and *fixed.*

Mobile kyphosis can be caused by poor posture (of course), muscle weakness (a strength imbalance surrounding your joints), and/or hip problems (deformity, or improper hip position relative to your other joints).

Fixed kyphosis can be caused by a collapse of your intervertebral spaces—the distance between your vertebrae. You see this type of kyphosis most often in patients with osteoporosis—a condition that can be offset, and possibly even reversed, with strength training and traction.

You probably don't need to ask if you have kyphosis. Nine out of 10 people I encounter have some degree of it. Does your head enter a room before the rest of your body? Hard one to answer, I know, since you can't watch yourself entering a room. Here's a self-test: Stand with your back against a wall and your shoulders pulled back. Now lean your head back until it touches the wall. If that's uncomfortable, you probably have some degree of kyphosis.

Lordosis is even easier to detect. Just stand sideways to a mirror and look at your torso. If the front of your waistline is lower than the back of your waistline, or if your stomach protrudes even though you're fairly lean, you have some degree of lumbar lordosis. ("Lumbar" refers to the lower-back region.)

It takes a variety of muscle imbalances to create that excessive arch in the lower back. You might have weak abdominal muscles relative to those in your lower back, or excessively tight hip-flexor muscles, or weak hip-extensor muscles (gluteals and hamstrings). Or you could have some combination of those.

It's also possible to have kyphosis and lordosis at the same time, exaggerating both ends of your spine's natural S-curve.

The first step to correcting poor posture is to keep your shoulders and head pulled back whether you're standing or seated. All of the drills below help you do that, in a variety of ways.

Lie on a foam roller. You can purchase a foam roller like the one in the following picture for less than $10. They're available online at specialty fitness outlets, and probably in some sporting-goods stores as well. The foam roller should run from the top of your head down between your legs, below your pelvic region. Lie on it for five minutes every day. Over the next few weeks, increase the duration in increments of a minute or two until you reach 10 minutes.

This is an excellent exercise to open up the spaces between your vertebrae, flatten out the excess curvature in your upper back, and shift your anterior pelvic tilt back towards normal. Put another way, you're restoring your back's natural S-curve, which has morphed into more of a candy cane—too straight on the bottom and too curved on the top.

Other benefits: You should reduce compression on your nerves, and thus improve strength and overall athletic performance. You end up resetting all

elements of your posture; your head, neck, shoulders, spine, lower back, and hip region all realign into their ideal positions.

Use a walking stick. Another simple technique I use with clients is what I call a walking stick. The implement is nothing more exotic than a broomstick. Hold it against your lower back, parallel to the floor. Grab each side of the stick with your palms facing forward, arms extended. Spend at least 10 minutes every day walking around in this position—longer is better. The walking stick will pull your shoulders back into proper alignment and shift your spine into a more favorable position. Be sure to keep your head pulled back; you want the back of your ear directly above the midpoint of your deltoid.

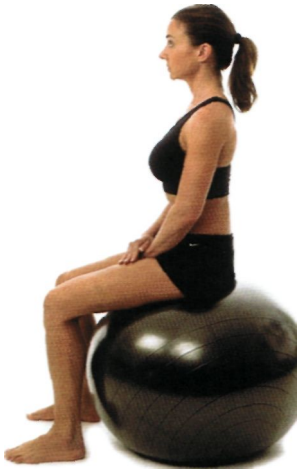
(If you live in a rough neighborhood, you might want to find a guy like the one in this picture to walk with you.)

Thoracic extension. Your thoracic region—the area around your chest—often gets compressed from poor posture and tight muscles that surround your spine (not to mention years of gravitational pull). This exercise makes the soft tissue surrounding your thoracic region more mobile. Lie across a foam roller that's approximately 6 inches in diameter. (You should be able to buy this roller wherever you bought the one shown in the first exercise in this section.) You can do it as a static exercise, holding this single position, or make it more dynamic (and more effective) by rolling yourself a few inches forward (that is, the roller moves up your spine) and backward (to the original position shown here). Perform this exercise for five minutes every day, adding a minute or two each week until you reach 10 minutes.

Swiss-ball chair. Replace your office chair with a Swiss ball. Buy one that's large enough in diameter so your knee joint is at approximately 90 degrees while sitting on it. (Your hip joint should be approximately equal to the height of your knee joint.) Sitting on a ball forces you to maintain a more upright seated position. This is a simple and effective way to increase the endurance strength of your postural muscles, since you won't be able to hunch forward or lean against the back of a chair. (I'm sitting on one right now as I write this book.) Ironically, the best "Swiss" ball I've found is made in Germany by Fitterfirst (fitter1.com).

My ultimate preference is Fitter-first's DuraBall, but I've also had success with their Classic version. If you're over, say, 200 pounds and can lift big weights, buy the DuraBall. If you're lighter, and don't figure to enter a Strongman competition anytime soon, buy the Classic. The size you choose, based on your height, will determine how much either costs. The DuraBall ranges between $35 and $75; the Classic will cost you between $23 and $35.

One last thing: These days, a "Swiss" ball is usually referred to as an "exercise" ball. So don't get confused by my old-school terminology. The terms are interchangeable.



Flexibility: a key to better posture *and* better recovery

Exercise causes fatigue that must be offset by rest. So it must seem counterintuitive to recommend another form of exercise—stretching—to help you

recover from other forms. I have two reasons:

First, stretching can accelerate recovery by forcing your tight muscles to relax. In fact, anything that helps you relax will enhance recovery. Yoga has become popular, in part, because of its proven anti-stress effects. After all, how many practices have survived for thousands of years?

Second, stretching can help your posture by lengthening the muscles that are too short.

My guess is that you don't have time for yoga classes at your local gym on non-workout days. And an hour-long class—particularly if it's based on "power yoga" or some other style that offers a conditioning benefit—probably would be more fatigue-inducing than you want.

That's why I recommend adding some basic stretches into your daily routine. The idea isn't to improve flexibility so much as restore it, allowing your muscles and connective tissues to resume their natural length by releasing some of the tension that follows a good workout. Reduce tension, and you provide your body with an environment that's optimal for recovery.

You can do the following stretches anytime, anywhere. I recommend doing this routine every day, after workouts on the days you train. On non-training days, it's up to you when to do them. If you're worried that you're too tight to even begin stretching, you can warm up with 10 minutes of medium-intensity cardio. But most of the time, you'll be fine doing the stretches without a 10-minute warm-up. Simply run in place or perform jumping jacks for two to three minutes to increase blood flow to your muscles. Warmer muscles stretch better.

Caution: It's a bad idea to stretch first thing in the morning, since your spinal disks hold excess fluid and are more prone to injury. Wait until you've been up and moving for a while so your disks have a chance to return to their normal size

Daily Stretching Routine

Perform the following stretching routine in the order shown here. Hold each stretch for 30 seconds with the greatest range you can tolerate. You should try to stretch a little farther in subsequent workouts.

Hip flexors

Inner thigh/groin

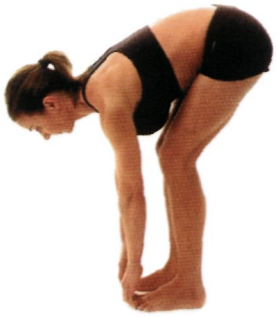
Lats/low back/anterior calf

Trunk rotators

Gluteus medius/outer hip

Quadratus lumborum/obliques/IT band

Low back/hamstrings/calf



Lats/triceps

Rhomboids/rear shoulder

Anterior shoulder/Lats/triceps

Pectorals

Wrist flexors/anterior shoulder

These stretches are by no means the only ones you can do, but they emphasize the areas that tend to be tightest on most people. You should perform this entire routine after each training session, but feel free to put a greater emphasis on the stretches that seem most difficult. Each picture demonstrates the ideal range of motion. If you can't mimic any or all of the stretches, keep stretching until you can. For those stretches, you can do them anywhere and anytime until your flexibility improves.

SECTION 2

Appl
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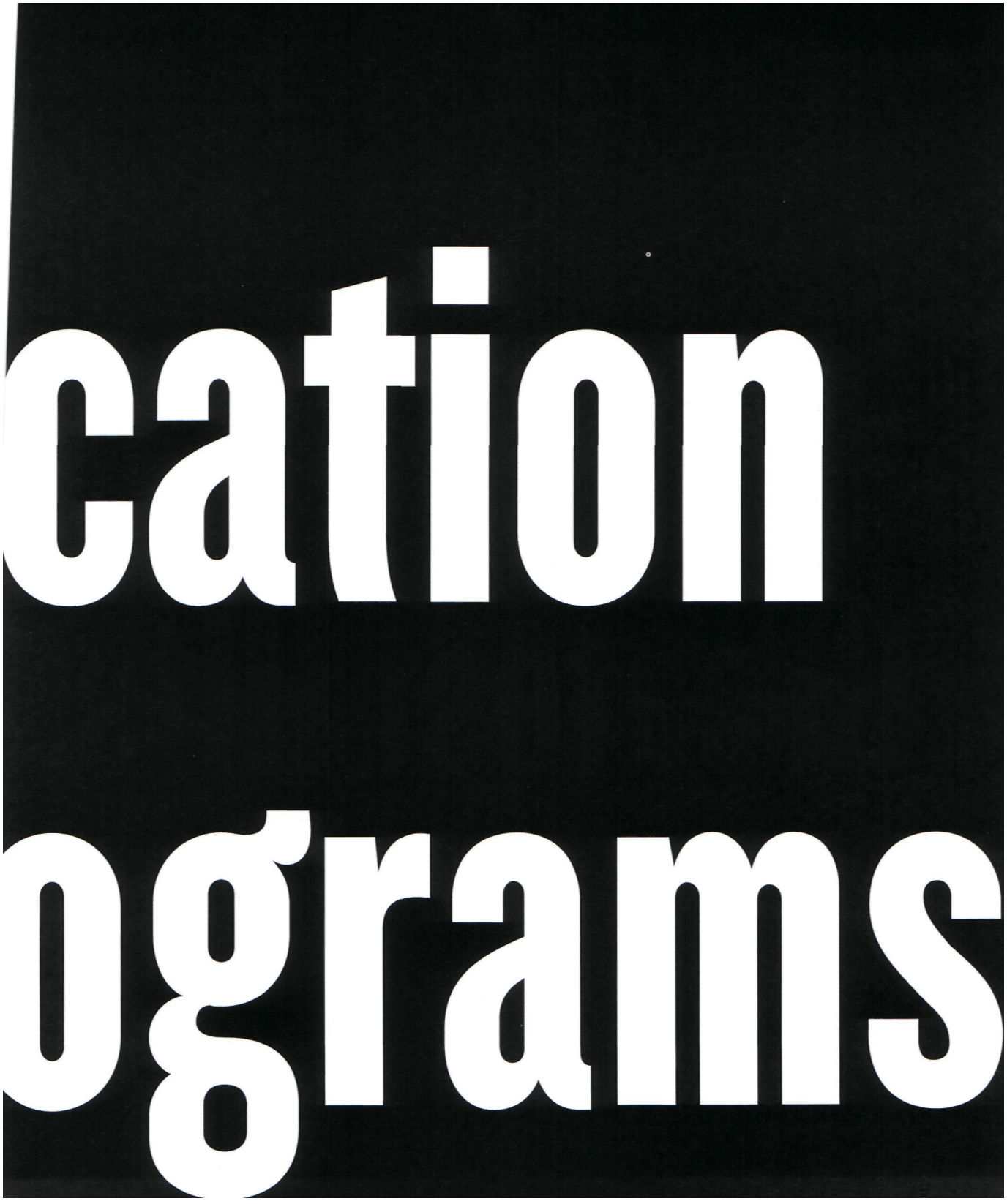
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CW's
Greatest Hits

I've been creating workouts at T-Nation.com since 2001,

and as long as I keep coming up with new ways to help readers get the results they want, I'll keep doing so. But there is one problem with creating dozens and dozens of programs over the years: Readers start to get confused about which to choose, and how to use them in sequence. The readers at T-nation are smart folks, and they can see that each workout has a slightly different focus, and that some are level-specific—that is, a workout may be more appropriate for an intermediate lifter than someone who's advanced, or vice-versa.

So one of my reasons for writing this book is to show readers at different levels and with different goals how they can put the programs together into a year-long, periodized system.

My goal in this chapter is exactly that.

First, some definitions:

To me, a *beginner* is someone who's been training seriously for less than one year. I know that a guy who's been training nine months and has gotten some results wouldn't consider himself a beginner, but I don't use the designation as an insult to you or to denigrate your commitment. What I mean is that your body is still learning the basic movements, and that it's just starting to make adaptations to training. A lot of guys who've been training for years are still beginners, simply because they haven't yet learned to do the major lifts properly, or they haven't progressed past beginner protocols (high reps, lightweights, unchallenging exercises), or they've never worked out hard and consistently enough to make

the adaptations that a more dedicated lifter can and should make in his first year with the weights.

An *intermediate* is someone who's been training consistently for at least a year, and has made significant and noticeable progress in that time. That is, if you've been lifting two to four times a week for more than 12 months, and you've gotten a lot of the results you were after—bigger muscles, increased strength, less fat—you're probably an intermediate. But don't bullshit yourself: If you can't do a squat with good form (your upper thighs parallel to the floor), or you've never learned to deadlift, or you still do bench presses by bouncing the load off your chest, you aren't an intermediate.

An *advanced* lifter is someone who's been training seriously and consistently for at least two years. You should know how to squat, deadlift, and bench press with textbook form. There's no single rule of thumb regarding strength, but if you can't bench press 125 percent of your body weight (that's 250 pounds for a 200-pounder) and squat and deadlift one and a half times your body weight (300 pounds if you weigh 200), you almost certainly are not advanced. You should also have some experience with Olympic-type lifts, such as power cleans and snatches. You don't have to be a competitive powerlifter, Olympic lifter, or bodybuilder, but you should be someone who has made so many adaptations to training that it's rare for you to see major gains from any single program.

Beginner-level programs

Before I describe my programs, I want to throw down a bit of fine print: These

are "beginner" programs by my definition of beginner—someone who is still at the front end of the spectrum of training adaptations. They aren't appropriate for a true beginner, someone who's never picked up a weight before. I do it this way for two big reasons:

First, if you're a true beginner, just about any program will do. It's probably best to stick with low volume (one to two sets) and fairly light weights for the first few weeks, and total-body workouts two or three times a week. But you can get that type of program anywhere, from anyone, and it would probably work as well as anything I'd design for those first weeks or months of training.

Second, I don't think anyone reads T-nation in general, or my articles in particular, to get newbie information. I write for guys looking for something better than their last program, even if their last program was one of mine. By definition, a guy who's never trained isn't looking for a better program. Anything he does will be the best one he's tried.

Anti-Bodybuilding Hypertrophy (ABBH)

This is the program that put me on the map. In 2003, T-Nation editors voted ABBH "The Most Effective Training Program" of the year. At last check, it's been translated into more than a dozen different languages. Why all the fuss? I think it comes down to this: Traditional linear-periodization plans have been in practice for decades in the United States. The purpose of linear periodization is to separate volume and intensity phases into separate cycles for fear of overtraining if the two were combined. But linear periodization has turned out to

be a lesson in futility, since the intensity phase usually caused a loss of overall fitness and endurance; while the volume phase sent your maximal strength levels plummeting. Based on the results I got with my clients, I knew there was a better way. So, I decided to kick traditional linear-periodization plans straight in the ass and run over that dogma with an 18-wheeler when I put simultaneous volume and intensity progressions into the same program.

Big Boy Basics (BBB)

I designed this program based on two simple but effective elements of program design: antagonist movement pairings (bench presses with rows, for example) and mirror-image exercise variations. So if you're doing a bench press with a medium-width, overhand grip, you do the rows with the same grip width and hand position. You also do the same sets and reps for each movement. I know other trainers have done the same thing without calling attention to it, but I discovered it was useful to show lifters how to "mirror" one exercise with its antagonist. The goal is create balanced development in the muscles around your major joints.

A second "mirror" technique is to alternate workouts with opposite set-rep schemes. So if one workout calls for eight sets of three reps of each exercise, the next workout would be three sets of eight.

Like ABBH, this was also an assault on the basic philosophy of linear periodization, since you're alternating between a hypertrophy protocol (3 x 8) and one traditionally used for strength and power (8 x 3). It's also a handy and

easy-to-remember way to goose any workout when you find yourself feeling stale—just flip it.

Triple Total Training (TTT)

This was my first program that consisted of multiple (three) total-body sessions each week. The purpose was to develop three different strength qualities simultaneously in each weekly session: maximal strength, endurance strength, and hypertrophy strength. Maximal strength is your ability to lift loads close to your 1RM. The idea is that with more strength you'll be able to work with heavier weights in all rep ranges; thus, strength triggers hypertrophy. Endurance strength focuses on working your muscles for longer periods of time (higher rep ranges), which builds oxidative capacity, which allows for more challenging and productive workouts. The goal is to be able to get more out of each workout through better muscle conditioning, which should make it easier to gain both strength and muscle mass. Finally, when you work in the rep range traditionally used for muscle growth—eight to 12 reps per set—you develop hypertrophy strength, or the kind of mass that makes strength gains easier to achieve.

So it's a triple-threat workout that breaks with the tenets of linear periodization in three ways: You're trying to build strength as a path to hypertrophy, muscle mass as a path to more strength, and muscle endurance as a path to improved strength *and* mass. Conventional wisdom says you should develop these three muscle qualities sequentially, but my experience tells me the results are better when you do them concurrently.

Intermediate-level programs

Strength-Focused Mesocycle (SFM)

As much as I object to linear periodization, on principle and in practice, there are times when it pays to focus on one particular aspect of muscular fitness. Pure strength is the best candidate for that kind of single-minded attention. Maximal strength sets your body up for big muscle gains by teaching it to recruit the largest motor units—the muscle fibers and neural connections reserved for the most challenging tasks. A program such as this one develops your maximal strength so you can lift heavier loads once you return to a hypertrophy-focused phase (if that's your next goal). This plan focuses on heavy loads, low to moderate reps, and large compound movements to build your overall strength.

Total Body Training (TBT)

TBT is one of my all-time most popular programs. In 2004, T-Nation editors voted TBT "Best Training Program of the Year." (This is the same award I won the year before, albeit, a slightly different title was given to the award). At the time I wrote TBT, most muscle-building plans in circulation used split routines based on the idea that it's better to train according to "body parts."

I had a different idea, and thought I could help swing the pendulum back in the opposite direction. There was a time, before the advent of steroids and six-days-a-week bodybuilding training, when three full-body workouts a week was considered the ticket to the biggest, strongest physique possible. Ironically, I

think a lot of non-steroid-using lifters do body-part training five or six days a week because it's easier. You see these guys in gyms all the time, starting workouts with small-muscle exercises like curls and extensions and hanging around for an hour to do 15 minutes' worth of work. Trust me when I say that such an approach will get you nowhere.

Total-body training isn't for loafers or slackers. It's hard, which is why it's tough for intermediate lifters to do it more than three times a week. In fact, my biggest concern was overtraining, that lifters wouldn't be able to recover from one workout in time to give a good effort in the next.

That's why I designed the program with constantly changing exercises, as well as different configurations of sets, reps, and rest periods from one workout to the next. Along with decreasing the risk of overtraining, this approach also keeps your body from adapting too quickly to the workouts, which would limit your gains.

A total-body workout is one of the best methods to build more muscle because the hormonal response is much greater than a sissy-assed-body-part only workout. The increase in anabolic hormones, along with a greater frequency than newsstand muscle magazines recommend, makes this one of my most effective workouts for size and strength development.

Waterbury Method (WM)

Two of my favorite set-rep combinations are 10x3 and 4x6. Both are excellent for hypertrophy because they also result in more maximal strength. So I designed

a program around these two configurations. I liked it so much that I named it after myself. (Shamelessly narcissistic? Sure. But you have to admit the name has a nice ring to it.) As with TBT, you get three total-body workouts a week, featuring compound exercises. But instead of shifting among many set-rep combos, you use the two I find extremely effective for strength and hypertrophy.

SOB Training (SOB)

Yes, "SOB" really does stand for what you think. I wanted to design a program for bad-ass dudes that was unlike any other. The novelty of SOB is that it combines rep ranges that are about as far apart as a Democrat and Republican during a debate about… well, just about anything. I swing the rep ranges as high as 50 per set, and as low as two per set. The result is a shocking increase in muscle mass, as well as a boost in overall conditioning, since you're training all your motor units in unique ways throughout the program.

Hybrid Hypertrophy (HH)

When I started out, most trainers focused on the mechanics of training the musculoskeletal system—"do this, build that." Some of the smarter ones included the workings of the endocrine system in their program design, examining how hormones like testosterone, growth hormone, and even Cortisol influenced workout results, for better or for worse.

But very few were talking about the nervous system, which became one of my main areas of research and expertise.

You see the results of my focus on the nervous system in HH. Each exercise

starts out with a heavy load to recruit the largest motor units. Then I decrease the load and have you perform a set in a higher rep range (12 to 14). After that, you end with another heavy-load set to re-recruit the largest motor units.

The purpose of following a heavy load with a light one is to trick your nervous system into allowing more repetitions with the lighter load than would be possible if you hadn't started with a heavy set. Here's the logic: Typically, your body expects you to gradually increase or decrease a load in a stepwise fashion. So if you do a set with 100 pounds, chances are it's preceded by a set with 80, in which case the 100 pounds feels heavy, relative to the 80 pounds you just lifted. But if you do a set with 150 before a set with 100, that 100 pounds is going to feel very light, and you're probably going to get more reps with it than you would have following a set with 80.

If you're a longtime lifter, this first part won't strike you as radical. It's just a back-off set from the old-school playbook, right? The reasoning may be different—the idea with back-off sets was to "flush" the metabolic waste from muscles by using a weight that allows high reps and a big pump—but the result should be the same.

I'll concede the point. But then I take it a step further, and throw in another low-rep, heavy-weight set following the lighter one. Now you're recruiting the largest motor units again, just when your body is least expecting it. Surprise!

In my own experience, and that of many readers, HH is one of my best programs for building strength and muscle at the same time. Even better, it's never boring.

Advanced-level programs

Outlaw Strength and Conditioning (OSC)

You may have noticed that most of the programs I've described so far have focused on strength and hypertrophy. The others focused on strength, mass, and muscle endurance. T-nation readers, being both smart and demanding, noticed this, too, and asked me for a program designed to increase overall conditioning to elite-athlete levels.

So I came up with OSC, a program with four total-body workouts each week.

Now, if you're among those smart and demanding readers, you'll notice that, when I described TBT earlier in this chapter, I said that three total-body workouts a week is pretty much all anyone who's accustomed to one-a-week body part training can handle at first. That's why OSC is in the Advanced section. Four total-body workouts in a seven-day period is brutal. It takes a high level of overall training experience, a high degree of conditioning (in other words, you have to be in pretty good shape to use OSC to get in ever better shape), a desire to work hard and an ability to do so, and a smart approach to nutrition and recovery.

The reward is that you'll put your cardiovascular system into overdrive and burn fat to a degree you never thought possible.

The novelty of this program is not only in its exercises, but also in the progression. Each workout uses shorter rest periods than the one that came before it; you'll go from 60 seconds' rest between sets at the beginning to 30 seconds by the end.

Single's Club (SC)

You may have noticed that I'm no fan of bodybuilding dogma. Show me something that everyone believes, and I'll try to prove it isn't true. The conventional wisdom says something won't work? I'll try to prove it does.

Case in point: Virtually everyone in muscle-building circles believes single-rep sets don't build muscle, despite the fact that a single rep at close to your 1RM should, in theory, activate every recruitable motor unit involved in the lift, from smallest to biggest. You can't leave any of them out and still lift the weight. So why are singles not used in hypertrophy programs?

Safety?

Okay, I'll concede that you have to take more precautions when using the heaviest possible weights. But assuming you've mastered proper exercise form (this is the Advanced section, after all), that you know your body well enough to know what it can and can't do, and that you can find spotters for the exercises that require them, why wouldn't you use singles?

So I created a program that runs on two parallel tracks: high-set, single-rep workouts, alternated with low-set, high-rep workouts.

Not only did readers who were brave enough to try it report huge gains in maximal strength from the single-rep sets, they also got nice increases in muscle mass from the variation in rep ranges.

This program will leave you wondering if there's any rep range that won't build muscle. The answer: a very emphatic "no."

Art of Waterbury (AW)

Once again, I use the 10 x 3 and 4 x 6 combination, as I did in Waterbury Method. But AW also uses the more conventional 3 x 12 scheme to give your body three classic configurations in the same program. You'll do three total-body sessions each week, featuring compound exercises.

Lift Fast, Get Big (LFGB)

As I explained in the "Powerful Neuroscience" chapter, fast contractions are very important for the development of strength and size. Lift faster and you'll recruit more motor units. So I designed an entire program around this simple scientific concept. This three-day-per-week, total-body program uses a different tempo guideline in each of its three training phases: fast contractions with no pause; fast contractions with a four-second pause; and fast contractions with a one-second pause. Look for big strength and size gains.

Quattro Dynamo (QD)

Like OSC, QD uses four total-body sessions each week. But the goal here is serious hypertrophy, which makes it more like TBT, my original total-body-workout program. I used a conjugate-periodization approach by developing four different strength qualities throughout the week: maximal strength, endurance strength, hypertrophy strength, and speed strength. It's not as well-known as some of my other programs, but it's gotten very high marks from my most discriminating and advanced readers.

Advanced-level booster programs

GPP ASAP

"General physical preparation"—GPP—is a term that was popularized by the late Mel Siff. The idea is that lifters need to do more than lifting to be in shape for lifting. So before or after weight workouts, or on days in between those workouts, you do exercises designed to improve whatever you feel is necessary for your overall conditioning, lifting performance, body composition, and/or health. Those exercises could include flexibility work, cardio conditioning, speed work, balance training ... You can broaden this category to include just about anything, as long as it doesn't take away from your performance in the gym. (Long-distance endurance work would fall into that realm.)

But at its most basic level, the goal of GPP is to improve your overall fitness levels, with the result being an ability to work out more effectively in the weight room, to do more work and do it with more vigor and intensity.

The concept isn't complicated, and just about anyone reading this could figure out a way to improve his GPP without my help. So when I set out to create a GPP program, I wanted to do something unique, something that would improve GPP ...well, ASAP.

GPP ASAP consists of circuits of exercises that train your entire body while pumping up your heart rate and challenging your balance and flexibility. You can do it at the end of your workouts or on the days that you don't lift.

On top of improving your fitness level, you'll also help your body recover

faster from your weight workouts by increasing blood flow to your muscles and thus flooding them with recovery-enhancing nutrients.

Perfect 10 (P10)

Another of my dogma-busting ideas is what I call high-frequency training, or HFT. I think it could prove to be the future of bodybuilding and performance enhancement. The idea is simple, but profoundly different from the standard bodybuilding idea of training each "body part" once a week. If one muscle group is lagging behind others, you should train it more often. The more you train those muscles, the more they'll grow.

In P10, you'll pick one or two muscle groups that are the hardest for you to develop, and increase your training frequency for those muscle groups to 10 sessions each week.

The results, readers tell me, have been mind-blowing, with many reporting that their worst muscle groups became their best. In 2005, T-Nation editors voted P10 "The Best Training Program of the Year."

Your Personalized Year-Long Plan

If you don't have any specific goal in mind other than building the best physique possible, you could simply start at the beginning of this list and work your way down. That would give you more than a year's worth of training. Most of us, however, have a specific goal in mind. In Chapter 2, I outlined the four most common goals:

- Increase muscle mass
- Increase muscle mass and lose fat
- Increase strength and lose fat
- Increase strength and muscle mass

The following are year-long progressions for each of those goals. Just choose your goal, photocopy the templates for each of the recommend workouts from the charts in this chapter and get your butt to the gym!

Goal: Increase muscle mass

Order of programs: ABBH, TTT, TBT, WM, SOB, AW, QD, TBT, WM, SOB, AW, QD

Goal: Increase muscle mass and lose fat

Order of programs: BBB, ABBH, TTT, OSC, BBB, ABBH, TTT, OSC, BBB, ABBH, TTT, OSC

Goal: Increase strength and lose fat

Order of programs: BBB, TTT, SFM, WM, BBB, TTT, SFM, WM, BBB, TTT, SFM, WM

Goal: Increase strength and muscle mass

Order of Programs: ABBH, SFM, WM, HH, SC, AW, LFGB, QD, WM, HH, LFGB, QD

The system is modular, so you can pursue any goal for as long as you want, and switch goals at any time. Figure that each program will take about a month to perform. So if you have a three-month window to reach a goal—let's say you want to increase muscle mass and lose fat in time for spring break—just do the first three programs listed with that goal. In this example, it would be BBB, ABBH, and TTT.

Your next goal is to increase strength and muscle mass. Assuming you've dedicated three months to that goal as well, you do ABBH, SFM, and WM. If you don't want to repeat ABBH, you could do SFM, WM, and then HH.

At the end of those three months, you decide to return to your original goal of hypertrophy and fat loss for the next three months. So now you do OSC, BBB, and ABBH. In other words, you pick up where you left off.

But let's say, after a month of OSC, you decide you don't want to repeat BBB and ABBH in the next two months. Sure, you got good results the first time around, but you've also bought this book and don't want to repeat programs when there are so many you haven't yet tried.

That's fine; in fact, your muscles will appreciate the novelty, although now you'll have to find another way to lose the fat.

So let's say you decide to shift your goal to hypertrophy, with GPP on non-training days to help with your body composition. You look at the workouts listed for "increase muscle mass," and the first one you haven't tried is TBT So you start with that, and then move to the next three programs you haven't attempted: SOB, AW, and QD.

You're now 11 months into your training year, and haven't yet repeated a program.

You have a lot of choices for that final month. If you want to finish the year bigger and stronger than you've ever been, you can do one of the remaining strength-and-mass programs, either SC or LFGB. If you're most concerned with fat loss, you can repeat OSC. Or, if you have the time and energy, you can take the plunge into high-frequency training and try P10.

The possibilities are endless. My four templates above are just a guideline, based on how I think my own programs work in sequence for a variety of goals. But you're the one driving your training program, not me. Who knows? Maybe you'll figure out a sequence that works better than any of mine.

Abbreviations for Templates
BB = barbell
DB = dumbbell
Ext. = extension
AMAP = as many as possible

Anti-Bodybuilding Hypertrophy (ABBH)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (80% of 1RM)				Day 17 (80% of 1RM)		
A1 BB bench press	10x3	60s		10x5	60s	
A2 BB bent-over row	10x3	60s		10x5	60s	
Day 3 (60% of 1RM)				Day 19 (70% of 1RM)		
A1 BB front squat	5x10	60s		5x10	60s	
A2 Reverse crunch	5x10	60s		5x10	60s	
A3 Standing calf raise	5x10	60s		5x10	60s	
Day5 (60%of 1RM)				Day 21 (70% of 1RM)		
A1 Dip	5x10	60s		5x10	60s	
A2 Chin-up	5x10	60s		5x10	60s	
Day 7 (80% of 1RM)				Day 23 (80% of 1RM)		
A1 BB deadlift	10x3	60s		10x5	60s	
A2 Seated calf raise	10x3	60s		10x5	60s	
A3 Ab wheel	10x3	60s		10x5	60s	
Day 9 (80% of 1 RM)						
A1 BB bench press	10x4	60s				
A2 BB bent-over row	10x4	60s				
Day 11 (65% of 1RM)						
A1 BB front squat	5x10	60s				
A2 Reverse crunch	5x 10	60s				
A3 Standing calf raise	5x10	60s				
Day 13 (65% of 1RM)						
A1 Dip	5x10	60s				
A2 Chin-up	5x 10	60s				
Day 15 (80% of 1RM)						
A1 BB deadlift	10x4	60s				
A2 Seated calf raise	10x4	60s				
A3 Ab wheel	10x4	60s				

Notes:

Big Boy Basics (BBB)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (80% of 1RM)				Days 8 & 15 (80% of 1RM)		
BB bench press	8 x 3	60s		8 x 3	55&50s	
Seated row	8 x 3	60s		8 x 3	55&50s	
Pull-up	8 x 3	60s		8 x 3	55&50s	
DB military press	8 x 3	60s		8 x 3	55&50s	
Day 2 (70% of 1RM)				Days 9 & 16 (72 & 74% of 1 RM)		
BB back squat	3 x 8	90s		3 x 8	90s	
Reverse crunch	3 x 8	60s		3 x 8	60s	
DB deadlift	3 x 8	60s		3 x 8	60s	
Ab wheel	3 x 8	60s		3 x 8	60s	
Standing calf raise	3 x 8	60s		3 x 8	60s	
Day 4 (70% of 1RM)				Days 11 & 18 (72 & 74% of 1RM)		
Incline DB bench press	3 x 8	90s		3 x 8	90s	
DB bent-over row	3 x 8	90s		3 x 8	90s	
BB curl	3 x 8	90s		3 x 8	90s	
Triceps pressdown	3 x 8	90s		3 x 8	90s	
Day 5 (80% of 1RM)				Days 12 & 19 (80% of 1RM)		
BB hack squat	8 x 3	60s		8 x 3	55&50s	
Leg curl	8 x 3	60s		8 x 3	55&50s	
Reverse crunch	8 x 3	60s		8 x 3	55&50s	
Seated calf raise	8 x 3	30s		8 x 3	55&50s	

Notes:

Triple Total Training (TTT)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (85%of 1RM)				Days 8 & 15 (87 & 89% of 1RM)		
A1 BB front squat	6 x 3	60s		6 x 3	60s	
A2 Chin-up	6 x 3	60s		6 x 3	60s	
B1 decline BB bench press	6 x 3	60s		6 x 3	60s	
B2 Back extension	6 x 3	60s		6 x 3	60s	
C1 Side bend	6 x 3	60s		6 x 3	60s	
C2 Standing calf raise	6 x 3	60s		6 x 3	60s	
Day 3 (55% of 1RM)				Days 10 & 17 (57 & 59% of 1RM)		
A1 BB military press	2 x 24	90s		2 x 24	90s	
A2 Reverse lunge	2x24	90s		2 x 24	90s	
B1 Dip	2 x 24	90s		2 x 24	90s	
B2 DB upright row	2 x 24	90s		2 x 24	90s	
C1 BB curl	2 x 24	90s		2 x 24	90s	
C2 DB side raise	2 x 24	90s		2 x 24	90s	
Day 5 (65% of 1RM)				Days 12 & 19 (65% of 1RM)		
BB box squat	8 x 3	60s		8 x 3	55&50s	
Push-up	8 x 3	60s		8 x 3	55&50s	
Seated row	8 x 3	60s		8 x 3	55&50s	
Reverse crunch	8 x 3	60s		8 x 3	55&50s	

Notes:

Strength Focused Mesocycle (SFM)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (80% of 1RM)				Days 8 & 15 (82 & 84% of 1RM)		
A1 Good morning	3 x 5	90s		3 x 5	90s	
A2 Dip	3 x 5	90s		3 x 5	90s	
B1 Chin-up	3 x 5	90s		3 x 5	90s	
B2 BB front squat	3 x 5	90s		3 x 5	90s	
Jump rope for 5 minutes				Jump rope for 5 minutes		
Day 3 (75% of 1RM)				Days 10 & 17 (77 & 79% of 1RM)		
A1 BB military press	3 x 8	120s		3 x 8	120s	
A2 BB box squat	3 x 8	120s		3 x 8	120s	
B1 Glute ham raise	3 x 8	120s		3 x 8	120s	
B2 Seated row	3 x 8	120s		3 x 8	120s	
Jumping jacks for 5 minutes				Jumping jacks for 5 minutes		
Day 5 (85% of 1RM)				Days 12 & 19 (87 & 89% of 1RM)		
A1 Power clean	3 x 3	90s		3 x 3	90s	
A2 Pull-up	3 x 3	90s		3 x 3	90s	
B1 Triceps lockout	3 x 3	90s		3 x 3	90s	
B2 Lunge	3 x 3	90s		3 x 3	90s	
Jump rope for 5 minutes				Jump rope for 5 minutes		

Notes:

Total Body Training (TBT)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (85% of 1RM)				Day 8 (87% of 1RM)		
BB front squat	3x5	60s		3x5	60s	
Chin-up	3x5	60s		3x5	60s	
BB decline bench press	3x5	60s		3x5	60s	
Back extension	3x5	60s		3x5	60s	
Reverse crunch	3x5	60s		3x5	60s	
Standing calf raise	3x5	60s		3x5	60s	
Day 3 (76% of 1RM)				Day 10 (78% of 1RM)		
Romanian deadlift	3x8	90s		3x8	90s	
DB incline bench press	3x8	90s		3x8	90s	
Bent-over row	3x8	90s		3x8	90s	
Push press	3x8	90s		3x8	90s	
DB triceps extension	3x8	90s		3x8	90s	
Seated calf raise	3x8	90s		3x8	90s	
Day 5 (65% of 1RM)				Day 12 (67% of 1RM)		
BB back squat	2x15	120s		2x15	120s	
Dip	2x 15	120s		2x15	120s	
Seated row	2x15	120s		2x 15	120s	
External rotation	2x15	120s		2x15	120s	
Ab wheel	2x15	120s		2x15	120s	
DB side raise	2x15	120s		2x15	120s	

All movements should be paired for days 8, 10 and 12. For example, the first four movements on day 8 could look like this:

A1 BB front squat
Rest 60s
A2 Chin-up
Rest 60s
Repeat A1/A2 movements twice more before moving on to B1/B2 pairings.

B1 Decline bench press
Rest 60s
B2 Back extension
Rest 60s
Repeat B1/B2 movements twice more before moving on to C1/C2 pairings.

Total Body Training (TBT) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 15 (85% of 1RM)				Day 22 (87% of 1RM)		
Step-up	4 x 5	60s		4 x 5	60s	
Pull-up	4 x 5	60s		4 x 5	60s	
DB incline bench press	4 x 5	60s		4 x 5	60s	
Leg curl	4 x 5	60s		4 x 5	60s	
Ab wheel	4 x 5	60s		4 x 5	60s	
Donkey calf raise	4 x 5	60s		4 x 5	60s	
Day 17 (76% of 1RM)				Day 24 (78% of 1RM)		
BB hack squat	4 x 8	90s		4 x 8	90s	
Dip	4 x 8	90s		4 x 8	90s	
BB Bent-over row	4 x 8	90s		4 x 8	90s	
Good morning	4 x 8	90s		4 x 8	90s	
BB curl	4 x 8	90s		4 x 8	90s	
External rotation	4 x 8	90s		4 x 8	90s	
Day 19 (65% of 1RM)				Day 26 (67% of 1RM)		
DB Romanian deadlift	3 x 15	120s		3 x 15	120s	
Skull crusher	3 x 15	120s		3 x 15	120s	
DB upright row	3 x 15	120s		3 x 15	120s	
BB military press	3 x 15	120s		3 x 15	120s	
Swiss ball crunch	3x 15	120s		3 x 15	120s	
Standing calf raise	3 x 15	120s		3 x 15	120s	

Use pairings on Days 22, 24 and 26

You can use any movements you desire for TBT. Stick with at least 4 compound movements for each workout.

Waterbury Method (WM)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (80% of 1RM)				Day 8 (82% of 1RM)		
BB squat	10x3	70s		10x3	70s	
A1 Dip	4 x 6	60s		4 x 6	60s	
A2 BB Bent-over row	4 x 6	60s		4 x 6	60s	
B1 Skull crusher	4 x 6	60s		4 x 6	60s	
B2 BB biceps curl	4 x 6	60s		4 x 6	60s	
Reverse crunch	4 x 6	60s		4 x 6	60s	
Day 3 (80% of 1RM)				Day 10 (82% of 1RM)		
BB bench press	10x3	60s		10x3	60s	
A1 Romanian deadlift	4 x 6	60s		4 x 6	60s	
A2 BB military press	4 x 6	60s		4 x 6	60s	
B1 Standing calf raise	4 x 6	60s		4 x 6	60s	
B2 DB upright row	4 x 6	60s		4 x 6	60s	
External rotation	4 x 6	60s		4 x 6	60s	
Day 5 (80% of 1RM)				Day 12 (82% of 1RM)		
Chin-up	10x3	70s		10x3	70s	
A1 Decline DB bench press	4 x 6	60s		4 x 6	60s	
A2 Hammer curl	4 x 6	60s		4 x 6	60s	
B1 Seated calf raise	4 x 6	60s		4 x 6	60s	
B2 Leg curl	4 x 6	60s		4 x 6	60s	
Lunge	4 x 6	60s		4 x 6	60s	

Notes:

Waterbury Method (WM) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 15 (84% of 1RM)				Day 22 (86% of 1RM)		
BB squat	10x3	70s		10x3	70s	
A1 Dip	4x6	60s		4x6	60s	
A2 BB Bent-over row	4x6	60s		4x6	60s	
B1 Skull crusher	4x6	60s		4x6	60s	
B2 DB biceps curl	4x6	60s		4x6	60s	
Reverse crunch	4x6	60s		4x6	60s	
Day 17 (84% of 1RM)				Day 24 (86% of 1RM)		
DB bench press	10x3	60s		10x3	60s	
A1 Romanian deadlift	4x6	60s		4x6	60s	
A2 BB military press	4x6	60s		4x6	60s	
B1 Standing calf raise	4x6	60s		4x6	60s	
B2 DB upright row	4x6	60s		4x6	60s	
External rotation	4x6	60s		4x6	60s	
Day 19 (84% of 1RM)				Day 26 (86% of 1RM)		
Chin-up	10x3	70s		10x3	70s	
A1 BB decline bench press	4x6	60s		4x6	60s	
A2 Hammer curl	4x6	60s		4x6	60s	
B1 Seated calf raise	4x6	60s		4x6	60s	
B2 Leg curl	4x6	60s		4x6	60s	
Lunge	4x6	60s		4x6	60s	

Notes:

SOB Training (SOB)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (80% of 1RM)				Day 9 (82% of 1 RM)		
BB bench press	10x3	75s		6x5	75s	
Chin-up	10x3	75s		6x5	75s	
Deadlift	10x3	75s		6x5	75s	
Standing calf raise	10x3	75s		6x5	75s	
Day 3 (50% of 1RM)				Day 11 (62% of 1RM)		
BB squat (narrow)	2x30	180s		4x15	120s	
DB Bent-over row	2x30	180s		4x15	120s	
DB military press	2x30	180s		4x15	120s	
French press	2x30	180s		4x15	120s	
Day 5 (50% of 1RM)				Day 13 (62% of 1RM)		
Lat pulldown	2x30	180s		4x15	120s	
BB Romanian deadlift	2x30	180s		4x15	120s	
DB decline bench press	2x30	180s		4x 15	120s	
Swiss ball crunch	2x30	180s		4x 15	120s	
Day 7 (80% of 1RM)				Day 15 (82% of 1RM)		
BB front squat (wide)	10x3	75s		6x5	75s	
Decline bench press	10x3	75s		6x5	75s	
DB upright row	10x3	75s		6x5	75s	
Preacher curl	10x3	75s		6x5	75s	

Notes:

SOB Training (SOB) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 17 (85% of 1RM)				Day 25 (80% of 1RM)		
DB incline bench press	12x2	75s		10x3	60s	
Pull-up	12x2	75s		10x3	60s	
Good morning	12x2	75s		10x3	60s	
Reverse crunch	12x2	75s		10x3	60s	
Day 19 (30% of 1RM)				Day 27 (55% of 1RM)		
BB squat (wide)	1 x50	180s		3x20	120s	
BB chest-supported row	1 x50	180s		3x20	120s	
BB military press	1 x50	180s		3x20	120s	
Hammer curl	1 x50	180s		3x20	120s	
Day 21 (30% of 1RM)				Day 29 (55% of 1RM)		
Seated row	1 x50	180s		3x20	120s	
DB Romanian deadlift	1 x50	180s		3x20	120s	
DB bench press	1 x50	180s		3x20	120s	
Swiss ball crunch	1 x50	180s		3x20	120s	
Day 23 (85% of 1RM)				Day 31 (80% of 1RM)		
BB front squat (narrow)	12x2	75s		10x3	60s	
Dip	12x2	75s		10x3	60s	
DB Bent-over row	12x2	75s		10x3	60s	
BB curl	12x2	75s		10x3	60s	

Notes:

Hybrid Hypertrophy (HH)				
Movements	**Sets x Reps**	**Load (% 1RM)**	**Rest**	**Weight**
Days 1,8, 15,22*				
BB close-grip bench press	4 x 3	80, 85, 90, 90%*	60s	
Skull crusher	1 x 12-14	70%	180s	
Deadlift	4 x 3	80, 85, 90, 90%	75s	
BB hack squat	1 x 12-14	70%	180s	
Chin-up	4 x 3	80, 85, 90, 90%	75s	
Pullover	1 x 12-14	70%	180s	
Days 3, 10, 17,24				
Power clean	4 x 3	80, 85, 90, 90%	70s	
BB squat	1 x 12-14	70%	240s	
Cable crunch	4 x 3	80, 85, 90, 90%	60s	
Reverse crunch	1 x 12-14	70%	180s	
BB incline bench press	4 x 3	80, 85, 90, 90%	60s	
DB military press	1 x 12-14	70%	180s	
Days 5, 12, 19,26				
Dip	4 x 3	80, 85, 90, 90%	60s	
French press	1 x 12-14	70%	180s	
BB bent-over row	4 x 3	80, 85, 90, 90%	60s	
DB bent-over side raise	1 x 12-14	70%	180s	
Romanian deadlift	4 x 3	80, 85, 90, 90%	75s	
BB box squat	1 x 12-14	*70%*	240s	

* Increase the load 2% for all sets with each subsequent workout.

Notes:

Outlaw Strength and Conditioning (OSC)				
Movements	**Sets x Reps**	**Load (% 1 RM)**	**Rest**	**Weight**
	Days 1,8, 15,22*			
Jump rope for 3 minutes				
Hand walkout	2x10	bodyweight	60,55,50,45s*	
DB dorsiflexion	2x25	50%	60,55,50,45s	
Standing calf raise	2x25	50%	60,55,50,45s	
Split squat	5x4	85%	60,55,50,45s	
Chin-up	5x4	85%	60,55,50,45s	
Zercher squat	5x4	85%	60,55,50,45s	
Decline DB pullover	5x4	85%	60,55,50,45s	
Waterbury walk	2x15	65%	60,55,50,45s	
Days 2, 9, 16,23				
Squat thrust	2x20	bodyweight	60,55,50,45s	
Dip	5x4	85%	60,55,50,45s	
1-leg DB deadlift	5x4	85%	60,55,50,45s	
DB bench press	5x4	85%	60,55,50,45s	
Glute ham raise	5x4	85%	60,55,50,45s	
Side deadlift	2x15	65%	60,55,50,45s	
Days 4, 11, 18,25				
Jump rope for 3 minutes				
Hand walkout	2x10	bodyweight	60,55,50,45s	
Donkey calf raise	2x25	50%	60,55,50,45s	
DB dorsiflexion	2x25	50%	60,55,50,45s	
BB Bent-over row	5x4	85%	60,55,50,45s	
BB front squat	5x4	85%	60,55,50,45s	
DB incline press	5x4	85%	60,55,50,45s	
Step-up	5x4	85%	60,55,50,45s	
BB military press	2x15	65%	60,55,50,45s	

Notes:

Outlaw Strength and Conditioning (OSC) cont				
Movements	**Sets x Reps**	**Load (% 1RM)**	**Rest**	**Weight**
Days 5, 12, 19,26				
Squat thrust	2x20	bodyweight	60,55,50,45s*	
Skull crusher	5x4	85%	60,55,50,45s	
DB external rotation	5x4	85%	60,55,50,45s	
BB partial military press	5x4	85%	60,55,50,45s	
Good morning	5x4	85%	60,55,50,45s	
Hanging pike	5x4	85%	60,55,50,45s	
Waterbury crucifix	2x 15	65%	60,55,50,45s	
Overhead figure 8	2x4	65%	60,55,50,45s	

*Decrease each rest period by 5s with each subsequent week/workout.

Notes:

Single's Club (SC)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (90% of 1RM)				Day 8 (90% of 1RM)		
BB squat	14x1	60s		15x1	60s	
Back extension	14x1	60s		15x1	60s	
Seated calf raise	14x1	60s		15x1	60s	
Day 3 (60% of 1RM)				Day 10 (62% of 1RM)		
A1 Chin-up	3x18	60s		3x 18	60s	
A2 DB bench press	3x18	60s		3x18	60s	
B1 BB curl	3x18	60s		3x18	60s	
B2 Skull crusher	3x18	60s		3x18	60s	
Day 4 (60% of 1RM)				Day 11 (62% of 1RM)		
A1 Deadlift	3x18	90s		3x18	90s	
A2 Standing calf raise	3x18	90s		3x18	90s	
B1 Lying leg curl	3x18	90s		3x 18	90s	
B2 Hanging pike	3x18	90s		3x18	90s	
Day 6 (90% of 1RM)				Day 13 (90% of 1RM)		
BB incline bench press	14 x 1	60s		15x1	60s	
Chest-supported row	14 x 1	60s		15x1	60s	
Dip	14 x 1	60s		15x1	60s	

Notes:

Single's Club (SC) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 15 (90% of 1RM)				Day 22 (90% of 1RM)		
BB back squat	16x1	60s		17x1	60s	
Back extension	16x 1	60s		17x1	60s	
Seated calf raise	16x1	60s		17x1	60s	
Day 17 (64% of 1RM)				Day 24 (66% of 1RM)		
A1 Chin-up	3x18	60s		3x 18	60s	
A2 DB bench press	3x18	60s		3x18	60s	
B1 BB curl	3x18	60s		3x18	60s	
B2 Skull crusher	3x18	60s		3x18	60s	
Day 18 (64% of 1RM)				Day 25 (66% of 1RM)		
A1 DB Deadlift	3x 18	90s		3x 18	90s	
A2 Standing calf raise	3x18	90s		3x 18	90s	
B1 Lying leg curl	3x18	90s		3x 18	90s	
B2 Hanging pike	3x 18	90s		3x 18	90s	
Day 20 (90% of 1RM)				Day 27 (90% of 1RM)		
BB incline bench press	16x1	60s		17x 1	60s	
Chest-supported row	16x1	60s		17x1	60s	
Dip	16x1	60s		17x1	60s	

Notes:

Art of Waterbury (AW)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (82% of 1RM)				Day 7 (84% of 1RM)		
A1 BB Push press	10x3	70s		10x3	70s	
A2 Chin-up	10x3	70s		10x3	70s	
B1 Good morning	10x3	70s		10x3	70s	
B2 Standing calf raise	10x3	70s		10x3	70s	
C1 Dip or decline bench	10x3	70s		10x3	70s	
C2 Ab wheel	10x3	70s		10x3	70s	
Day 3 (70% of 1RM)				Day 9 (70% of 1RM)		
BB squat	3x12	90s		3x12	85s	
BB Bent-over row	3x12	90s		3x12	85s	
DB bench press	3x12	90s		3x12	85s	
Seated calf raise	3x12	90s		3x12	85s	
Triceps pressdown	3x12	90s		3x12	85s	
External rotation	3x12	90s		3x12	85s	
Day 5 (80% of 1RM)				Day 11 (80%of1RM)		
A1 BB hack squat	4x6	75s		5x6	75s	
A2 Skull crusher	4x6	75s		5x6	75s	
B1 Power clean	4x6	75s		5x6	75s	
B2 Hammer curl	4x6	75s		5x6	75s	
C1 BB incline bench press	4x6	75s		5x6	75s	
C2 Reverse crunch	4x6	75s		5x6	75s	

Notes:

Art of Waterbury (AW) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 13 (85% of 1RM)				Day 19 (86% of 1RM)		
A1 BB Push press	10x3	70s		10x3	70s	
A2 Chin-up	10x3	70s		10x3	70s	
B1 Good morning	10x3	70s		10x3	70s	
B2 Standing calf raise	10x3	70s		10x3	70s	
C1 Dip or decline bench	10x3	70s		10x3	70s	
C2 Ab wheel	10x3	70s		10x3	70s	
Day 15 (70% of 1RM)				Day 21 (70% of 1RM)		
BB squat	3x12	80s		3x12	75s	
BB Bent-over row	3x12	80s		3x 12	75s	
DB bench press	3x 12	80s		3x12	75s	
Seated calf raise	3x12	80s		3x12	75s	
Triceps pressdown	3x12	80s		3x12	75s	
External rotation	3x12	80s		3x 12	75s	
Day 17 (80% of 1RM)				Day 23 (80% of 1RM)		
A1 BB hack squat	6x6	75s		7x6	75s	
A2 Skull crusher	6x6	75s		7x6	75s	
B1 Power clean	6x6	75s		7x6	75s	
B2 Hammer curl	6x6	75s		7x6	75s	
C1 DB incline bench press	6x6	75s		7x6	75s	
C2 Reverse crunch	6x6	75s		7x6	75s	

Notes:

Lift Fast, Get Big (LFGB)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (84% of 1RM)				Day 8 (86% of 1RM)		
Dip	6 x 3	50s		6 x 3	50s	
BB front squat	6 x 3	50s		6 x 3	50s	
Chin-up	6 x 3	50s		6 x 3	50s	
Leg curl	6 x 3	50s		6 x 3	50s	
Seated calf raise	6 x 3	50s		6 x 3	50s	
Day 3 (80% of 1RM)				Day 10 (82% of 1RM)		
BB bench press	5 x 5	60s		5 x 5	60s	
Deadlift	5 x 5	60s		5 x 5	60s	
DB Bent-over row	5 x 5	60s		5 x 5	60s	
Lying triceps extension	5 x 5	60s		5 x 5	60s	
Donkey calf raise	5 x 5	60s		5 x 5	60s	
BB curl	5 x 5	60s		5 x 5	60s	
Day 5 (78% of 1RM)				Day 12 (80% of 1RM)		
BB incline bench press	4 x 6	70s		4 x 6	70s	
BB squat	4 x 6	70s		4 x 6	70s	
Power clean	4 x 6	70s		4 x 6	70s	
BB close-grip bench press	4 x 6	70s		4 x 6	70s	
Standing calf raise	4 x 6	70s		4 x 6	70s	
Preacher curl	4 x 6	70s		4 x 6	70s	

Notes:

Lift Fast, Get Big (LFGB) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 15 (88% of 1RM)				Day 22 (90% of 1RM)		
Dip	6 x 3	50s		6 x 3	50s	
BB front squat	6 x 3	50s		6 x 3	50s	
Chin-up	6 x 3	50s		6 x 3	50s	
Leg curl	6 x 3	50s		6 x 3	50s	
Seated calf raise	6 x 3	50s		6 x 3	50s	
Day 17 (84% of 1RM)				Day 24 (86% of 1RM)		
BB bench press	5 x 5	60s		5 x 5	60s	
Deadlift	5 x 5	60s		5 x 5	60s	
BB Bent-over row	5 x 5	60s		5 x 5	60s	
Lying triceps extension	5 x 5	60s		5 x 5	60s	
Donkey calf raise	5 x 5	60s		5 x 5	60s	
BB curl	5 x 5	60s		5 x 5	60s	
Day 19 (82% of 1RM)				Day 26 (84% of 1RM)		
DB incline bench press	4 x 6	70s		4 x 6	70s	
Back squat	4 x 6	70s		4 x 6	70s	
Power clean	4 x 6	70s		4 x 6	70s	
BB close-grip bench press	4 x 6	70s		4 x 6	70s	
Standing calf raise	4 x 6	70s		4 x 6	70s	
Preacher curl	4 x 6	70s		4 x 6	70s	

Notes:

Quattro Dynamo (QD)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (85% of 1RM)				Day 8 (87% of 1RM)		
A1 BB squat	5 x 3	60s		5 x 3	60s	
A2 Lying leg curl	5 x 3	60s		5 x 3	60s	
B1 BB bench press	5 x 3	60s		5 x 3	60s	
B2 Chest-supported row	5 x 3	60s		5 x 3	60s	
C1 BB curl	5 x 3	60s		5 x 3	60s	
C2 Triceps pressdown	5 x 3	60s		5 x 3	60s	
Day 2 (50% of 1 RM)				Day 9 (52% of 1RM)		
A1 BB military press	2 x 25	90s		2 x 25	90s	
A2 Lat pulldown	2 x 25	90s		2 x 25	90s	
B1 BB squat	2 x 25	90s		2 x 25	90s	
B2 Lying leg curl	2 x 25	90s		2 x 25	90s	
Day 4 (78% of 1RM)				Day 11 (80% of 1RM)		
A1 Good morning	3 x 8	75s		3 x 8	75s	
A2 Hanging knee raise	3 x 8	75s		3 x 8	75s	
B1 DB incline bench press	3 x 8	75s		3 x 8	75s	
B2 Power clean	3 x 8	75s		3 x 8	75s	
C1 EZ bar reverse curl	3 x 8	75s		3 x 8	75s	
C2 EZ bar triceps ext.	3 x 8	75s		3 x 8	75s	
Day 6 (60% of 1 RM)				Day 13 (60% of 1RM)		
Explosive lunge	6 x 3	60s		7 x 3	60s	
Explosive cable crunch	6 x 3	60s		7 x 3	60s	
Explosive push-up	6 x 3	60s		7 x 3	60s	
Explosive chin-up	6 x 3	60s		7 x 3	60s	

Notes:

Quattro Dynamo (QD) cont.						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 15 (89% of 1RM)				Day 22 (90% of 1 RM)		
A1 BB squat	5 x 3	60s		5 x 3	60s	
A2 Lying leg curl	5 x 3	60s		5 x 3	60s	
B1 BB bench press	5 x 3	60s		5 x 3	60s	
B2 Chest-supported row	5 x 3	60s		5 x 3	60s	
C1 BB curl	5 x 3	60s		5 x 3	60s	
C2 Triceps pressdown	5 x 3	60s		5 x 3	60s	
Day 16 (54% of 1RM)				Day 23 (56% of 1 RM)		
A1 BB military press	2 x 25	90s		2 x 25	90s	
A2 Lat pulldown	2 x 25	90s		2 x 25	90s	
B1 BB squat	2 x 25	90s		2 x 25	90s	
B2 Lying leg curl	2 x 25	90s		2 x 25	90s	
Day 18 (80% of 1RM)				Day 25 (80% of 1RM)		
A1 Good morning	4 x 8	75s		5 x 8	75s	
A2 Hanging knee raise	4 x 8	75s		5 x 8	75s	
B1 DB incline bench press	4 x 8	75s		5 x 8	75s	
B2 Power clean	4 x 8	75s		5 x 8	75s	
C1 EZ bar reverse curl	4 x 8	75s		5 x 8	75s	
C2 EZ bar triceps ext.	4 x 8	75s		5 x 8	75s	
Day 20 (60% of 1RM)				Day 27 (60% of 1RM)		
Explosive lunge	8 x 3	60s		9 x 3	60s	
Explosive cable crunch	8 x 3	60s		9 x 3	60s	
Explosive push-up	8 x 3	60s		9 x 3	60s	
Explosive chin-up	8 x 3	60s		9 x 3	60s	

Notes:

GPP ASAP		
Movement	**Reps/Duration**	**Rest**
A1 Squat thrust/push-up/chin-up (hybrid 1)	AMAP in 90s	10s
A2 Sit-up/stand-up/jump-up (hybrid 2)	AMAP in 90s	10s
A3 GPP lunges (lunge w/hands behind head)	AMAP in 90s	60s

Description: Perform movements A1-A3 with 10s rest between each movement. After A3, rest 60s and repeat the cycle 3-5 more times. Perform this GPP workout 2-4 times each week either after your weight workouts, or on your "off' days.

Notes:

Perfect 10 (P10)						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 1 (85% of 1RM)				Day 19 (80% of 1RM)		
	6 x 3	70s		7 x 5	90s	
	6 x 3	70s		7 x 5	90s	
Day 3 (72% of 1RM)				Day 20 (50% of 1 RM)		
	3 x 10	120s		2 x 25	180s	
	3 x 10	120s		2 x 25	180s	
Day 5 (80% of 1 RM)				Day 22 (86% of 1RM)		
	5 x 5	90s		3 x 3	70s	
	5 x 5	90s		3 x 3	70s	
Day 8 (85% of 1RM)				Day 24 (72% of 1 RM)		
	7 x 3	70s		3 x 8	120s	
	7 x 3	70s		3 x 8	120s	
Day 9 (50% of 1 RM)				Day 26 (68% of 1 RM)		
	2 x 25	180s		2 x 12	90s	
	2 x 25	180s		2 x 12	90s	
Day 10 (72% of 1RM)				Notes:		
	4 x 10	120s				
	4 x 10	120s				
Day 12 (80% of 1RM)						
	6 x 5	90s				
	6 x 5	90s				
Day 15 (85% of 1RM)						
	8 x 3	70s				
	8 x 3	70s				
Day 16 (50% of 1RM)						
	2 x 25	180s				
	2 x 25	180s				
Day 17 (72% of 1RM)						
	5 x 10	120s				
	5 x 10	120s				

Perfect 10 (P10) cont. 1						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 29 AM (85% of 1RM)				Day 40 AM (85% of 1RM)		
	3x3	70s		4x3	70s	
	3x3	70s		4x3	70s	
Day 29 PM (72% of 1 RM)				Day 40 PM (74% of 1 RM)		
	3x8	120s		1 x15		
	3x8	120s		1 x15		
Day 31 AM (68% of 1RM)				Day 41 (50% of 1RM)		
	2x12	90s		2x25	180s	
	2x12	90s		2x25	180s	
Day 31 PM (85% of 1RM)				Day 43 AM (72% of 1RM)		
	3x5	90s		3x8	90s	
	3x5	90s		3x8	90s	
Day 33 AM (50% of 1 RM)				Day 43 PM (55% of 1 RM)		
	2x25	180s		2x20	180s	
	2x25	180s		2x20	180s	
Day 33 PM (78% of 1RM)				Day 44 (50% of 1 RM)		
	1 x12			2x25	180s	
	1 x12			2x25	180s	
Day 36 AM (85% of 1RM)				Day 45 AM (87% of 1RM)		
	4x3	70s		3x3	70s	
	4x3	70s		3x3	70s	
Day 36 PM (72% of 1RM)				Day 45 PM (68% of 1RM)		
	4x8	120s		3x12	120s	
	4x8	120s		3x12	120s	
Day 37 (50% of 1 RM)				Day 46 (50% of 1 RM)		
	2x25	180s		2x25	180s	
	2x25	180s		2x25	180s	
Day 38 AM (68% of 1RM)				Day 47 AM (87% of 1 RM)		
	3x12	90s		3x3	70s	
	3x12	90s		3x3	70s	
Day 38 PM (80% of 1 RM)				Day 47 PM (78% of 1RM)		
	4x5	90s		1 x10		
	4x5	90s		1 x10		

Perfect 10 (P10) cont. 2						
Movements	**Sets x Reps**	**Rest**	**Weight**	**Sets x Reps**	**Rest**	**Weight**
Day 48 (50% of 1RM)				Day 57 AM (82% of 1RM)		
	2x25	180s		3x5	70s	
	2x25	180s		3x5	70s	
Day 50 AM (78% of 1RM)				Day 57 PM (64% of 1 RM)		
	3x8	90s		2x15	120s	
	3x8	90s		2x15	120s	
Day 50 PM (55% of 1RM)				Day 58 (50% of 1RM)		
	2x20	180s		2x25	180s	
	2x20	180s		2x25	180s	
Day 51 (50% of 1RM)				Day 59 AM (88% of 1 RM)		
	2x25	180s		3x3	75s	
	2x25	180s		3x3	75s	
Day 52 AM (88% of 1 RM)				Day 59 PM (60% of 1RM)		
	3x3	70s		2x20	180s	
	3x3	70s		2x20	180s	
Day 52 PM (70% of 1RM)				Day 60 (50% of 1RM)		
	3x 12	120s		2x25	180s	
	3x 12	120s		2x25	180s	
Day 53 (50% of 1RM)				Day 61 AM (72% of 1RM)		
	2x25	180s		3x10	120s	
	2x25	180s		3x10	120s	
Day 54 AM (88% of 1 RM)				Day 61 PM (85% of 1RM)		
	3x3	70s		6x3	90s	
	3x3	70s		6x3	90s	
Day 54 PM (78% of 1RM)				Day 62 AM (50% of 1 RM)		
	1 x10			2x25	180s	
	1 x 10			2x25	180s	
Day 55 (50% of 1RM)				Day 62 PM (25% of 1RM)		
	2x25	180s		1 x50		
	2x25	180s		1 x50		

Notes:

You're one page turn away from the Total Strength Program

10 Total Strength Program

Most of my programs focus on delivering

what most of my readers want: the biggest possible muscles, obtained as fast and efficiently as possible, without the need for anabolic drugs. Improving strength and overall conditioning are important aspects of my programs, but to many readers, they're side effects. The real purpose is bigger muscles.

The Total Strength Program (TSP) is different. Sure, you'll get bigger muscles in any version of this 12-week program (and there are several versions to choose from, as I'll explain). But this time the goal is to make yourself stronger. Much, much stronger. And not just stronger in general—although that, like hypertrophy, will happen. I want you to get stronger in one or more of the three powerlifts: bench press, deadlift, and squat.

But don't mistake this as a powerlifting program, and nothing more. It's a terrific program for powerlifters, but my goal is to help you use the powerlifts to reach your own goals, whether you compete in anything or work out for the classic reasons—strength, size, power, performance.

The key to TSP is one of the most effective strength-building methods I've used in more than a decade of working with athletes: the supramaximal hold.

Don't let the jargon put you off. This is more straightforward than it sounds. A "supramaximal" load is easily defined: It's a weight that's greater than you could lift for one full-range-of-motion repetition. For example, if you can bench-press 300 pounds from chest to lockout, then a supramaximal load is anything more than 300 pounds.

You know, of course, that shortening that range of motion allows you to work with a heavier load. We've all seen guys in the gym who claim PRs despite cutting inches (if not feet) off the distance the bar has to travel. But cheating yourself isn't the goal here. The idea is to use isometric holds and shortened ranges of motion deliberately and systematically, with the goal of increasing the amount of weight you can lift through the entire range.

Let's start with isometric holds. (The word "isometric" means you're creating tension in a muscle without changing the muscle length.) If your 1RM in the full-range-of-motion bench press is 300 pounds, the amount you can hold above your chest with nearly straight arms is at least 125 percent of that—375 pounds. That's a lot of weight to hold in your hands.

The number, though, isn't particularly important. No bragging rights will ever be associated with a supramaximal hold. The idea is to train your nervous system and joints to handle much heavier loads than they're used to. You're "priming" your body for much greater strength with a neuromuscular phenomenon known as postactivation potentiation. Once your hands and arms and shoulders and torso get accustomed to holding 350 or 375 pounds, then 315 won't feel like an impossibly heavy weight, even though it's more than your previous best.

A second goal of TSP is to develop *explosive strength,* which is defined as your ability to develop maximum force when available time is limited. It's one of the most important strength qualities that any power athlete can develop.

Explosive strength has three components: *maximal strength, starting strength,* and *acceleration strength.* The supramaximal holds, which I've already

described, enhance the first component, maximal strength. Remember that the holds involve the final few inches of the range of motion, where you can handle the heaviest loads.

You'll develop starting strength by doing the opposite: You'll work with weights that are lighter than your 1 RM, and move them through the first part of the range of motion. With the bench press, that means moving the bar from your chest to a point a few inches above your chest.

Starting strength has a subcategory in the bench press: *isometric strength.* In competition, you have to hold the weight on your chest for a moment before you get the signal to start the lift. So it's important to train your body to move that weight from a dead stop. Supramaximal holds also develop isometric strength, of course, at the top end of the range of motion. You'll be holding the weight with a very slight bend in your elbows, and thus developing strength in your triceps that will help you lock out heavier weights by the end of the program. One of the interesting quirks of isometric strength is that it applies to a range of motion above and below the spot where you actually held the weight. So when you hold a weight two or three inches below lockout, you're improving your functional strength 15 degrees above and below the spot where you actually held the weight.

To improve on the final component, acceleration strength, you'll do something fun: Lift light loads as fast as you can. It would be cool, in a scary kind of way, to develop this strength quality by throwing a barbell off your chest, releasing it at the top and then catching it on the way down. But it would be reckless

for you to do that unless you had equipment designed just for that purpose. (Some university-based human performance laboratories do have stations set up for this, with hydraulic wizardly that allows the bar to return slowly to your hands after you've launched it over your chest.) Instead, you'll do exercises like explosive push-ups, coming up off the floor on every repetition, which are fun and challenging in their own way.

So much for the sales pitch. Let's get into the particulars.

How to choose a program

You'll find three distinct 12-week TSP programs in this chapter: one each for bench press, deadlift, and squat. After the squat program, you'll find instructions for creating a TSP program that develops all three powerlifts, as well as programs that develop two: bench press and deadlift, or bench press and squat. (There's too much crossover in the deadlift and squat programs to allow a combination of those. You'd end up putting too much stress on your lower back and knees, which is too much risk with too little potential reward.)

One unusual aspect of the single-lift TSP is that, by design, they make you focus more on one-half of your body—upper body if you're doing TSP: Bench Press, lower body if you're doing the deadlift or squat programs. Since no one wants half a good body, I've included instructions for doing maintenance-type work for the half of your body that isn't the focus of the TSP you've chosen. You may choose to do more work than I recommend, but I caution you to consider recovery issues. If your nervous system can't recover from workout to workout

because of the extracurricular lifts, your TSP won't deliver the results you want.

TSP: Bench Press

You know that the bench press is a "chest" exercise. You know because everyone crowds the bench-press stations in your gym on "chest day." So I don't need to tell you that strong pectoral muscles are not only a consequence of dedicated bench pressing, but also a requirement if you're going to improve in the lift. However, a chest can't grow strong in isolation. You must also have strong triceps, anterior deltoids, rotator cuffs and lats. (The lats, like your pectorals and front delts, are internal shoulder rotators. That is, they help rotate your upper arms inward. If your lats are weak, your bench press will suffer, since your body won't allow one internal rotator to achieve strength that's out of proportion to other internal rotators.)

A good bench press also includes high levels of all the aspects of explosive strength that I mentioned earlier: maximal strength, starting strength (including isometric strength from the stretched position), and acceleration strength, a quality that includes the subcategory of reversal strength.

Testing

If I were to tell you that this program will make you substantially stronger than you are now, you might believe me, you might scoff, and you might try it just to prove me wrong. But surely you'll agree with this: You can't possibly prove me right or wrong unless you know how strong you are now.

Furthermore, when I tell you that this program works by shoring up your

weaknesses in the bench press, you'll never know if that's true unless you know where you're weakest.

That's why this program begins and ends with a series of tests. The first thing you'll do is test all aspects of your bench press to assess your present strength and identify your weak links. You'll complete the program by retesting your strength to see how much you've improved.

The perfect bench press

On all of the following tests, use this form:

1. Lie on your back on a flat bench with your feet spread as wide as comfortably possible. The actual distance between your feet will vary based on your leg length. Wider is better, within the bounds of physical comfort.
2. Now that you have your feet wide, I want you to scoot your feet back toward your head as far as possible while still being able to touch your heels to the floor. This creates a wide base of support, stabilizing your torso and, thus, the weight you're lifting. In addition, this foot position mandates a slight arch in your lower back. This is a powerful, athletic position, perfect for generating maximum force.
3. With your butt and shoulder blades in contact with the bench, take the recommended grip on the bar. (You'll test yourself with several different grip widths now, and then vary your grip throughout the program.)
4. Have a spotter lift the load off the supports so you can hold it over your

chest in the starting position. You won't need to use a spotter for every set of every exercise in the program, but you definitely want one for these tests. You'll save your shoulders from some unnecessary stress, and also have the confidence to challenge yourself in the tests.

5. While holding the barbell above your chest with straight arms, try to pull your elbows together. This will activate your triceps and minimize strain on your shoulder region.
6. Suck as much air into your abdominal region as possible, hold your breath, dig your heels into the floor, and lower the barbell to your lower chest/upper abdominal region. This may be different from how you were taught, and thus feel awkward at first. But it's safer for your shoulders, makes better use of your triceps, and shortens the range of motion of the actual lift, all of which are important when you want to bench bigger weights.
7. Push the weight up until your arms are straight, keeping your lower back arched. Exhale when you complete the lift.

How to test your 1RM

If you're nervous about testing your 1RM, it's understandable. Trainers have been sounding alarms about the dangers of max lifting for a generation now. But it's only dangerous if you do something stupid. Follow this testing protocol and you'll have nothing to fear.

First, make sure you have a spotter.

Second, make sure the spotter understands what you're trying to accomplish. Remember that a 1RM is the most weight you bench once with perfect form *and no help from your spotter.* If he touches the bar, you've failed on the lift. A lot of inexperienced spotters will simply grab the bar and help you finish the lift as soon as you start to struggle. They mean well, but in this case their eagerness to help will ruin your test. That's why you have to work out a signal with the spotter so he doesn't help until you're sure you can't finish the lift.

Third, warm up thoroughly. One easy-to-remember system is to move up in 50-pound increments. So you'd start with a few quick reps with the bar (45 pounds). Then add a 25 to each side, and do perhaps three reps with 95 pounds. Replace the 25s with 45s, and do two or three reps with 135. From there, restrict yourself to one or two reps with each weight—185, 225, 275—until you get close to your max.

At that point, start moving up in lower increments (five to 10 pounds), and take more time between attempts.

You don't have to go through this long warm-up protocol with each of the tests below, since the movements are similar and you should be thoroughly warmed up after the first. But you also don't want to cheat yourself by trying to max out before your muscles and nervous system are ready.

Finally, write down the loads you lifted on each test. Don't trust your memory, which in men is genetically inflationary. Treat these numbers as you would bowling or golf scores, recording your total for each max lift as soon as you complete it.

Test #1: Grip width

This is really three tests. You're going to reach your 1 RM with three different grip widths:

- wide (index fingers around the rings of the bar)
- medium (pinky fingers two inches inside the rings on each side)
- close (thumbs set so they're exactly as far apart as the width of your torso just below your pectorals; if you go narrower, you're putting unnecessary stress on your wrists).

Test #2: Explosive strength

Again, this is three tests in one:

- index fingers 32 inches apart
- index fingers 24 inches apart
- index fingers 16 inches apart

You're going to perform an explosive push-up with your hands at each of those three widths. Make sure you start with your hands on a mat, unless the floor is carpeted and well-padded. Lower yourself to the floor in one second, then push up as hard as you possibly can, with your hands coming off the floor. (Your chest should just touch the floor.)

Land with your elbows "soft"—slightly bent—to minimize the jolt.

If possible, use a spotter to help you judge how high your chest rose on each test.

Again, write down your results. You don't need to record push-up heights for each; just rank each hand position from strongest to weakest.

Usually, your strengths and weaknesses on the explosive push-up will correlate with your bench-press grips. If the wide position is the strongest on one, it'll probably be strongest on the other.

Before you work out, consider how you'll recover

I know it seems strange to talk about recovery from these workouts before you've actually done one. But trust me: Your success on this program depends on how well you're able to recover from one workout to the next.

Here are your strategies:

Active recovery sessions: Active recovery sessions on the days following workouts utilize an extremely light load (perhaps 25 percent of 1RM) with high repetitions (25 to 50 per set) in order to flood the muscles with blood. The goal is to get more nutrients into the areas you've worked. You can keep it simple, and you don't even have to go to the gym. Two sets of 25 push-ups and an equivalent number of rows with anything you have sitting around will work just fine. If you're

going to the gym anyway, you can do it as described for Day 2 in the following workout charts. You can also throw in some ab work on recovery days, if you want.

Ice massage: Ice is your best friend. Ice massage will accelerate your recovery by reducing delayed-onset muscle soreness (DOMS), and enhancing the overall recovery process. All you need are two small paper cups filled with water, the kind you find by the water cooler at work. Place them in the freezer until the water is frozen solid. After each bench press session, you'll use one entire cup on each pectoral region. (I know, I said "cup" and "pectoral region" in the same sentence. Yuk it up.) Within two hours of your workout, rub the ice cup the entire length of your pectoral region from your shoulder to your sternum. Use long, deep strokes, following the direction of the fibers (east to west), and tearing away the paper as the ice starts to melt. Use one cup per pec, or two cups after each workout. To avoid ice burn, rub some baby oil or olive oil on your skin before massaging it with ice.

Lower-body exercises, abs, and energy-systems work

On Day 1 and Day 5, following your TSP workout, do several sets of lower-body exercises. I recommend doing a squat exercise or variation (hack squat, lunge) one day, and a deadlift or variation (Romanian deadlift, good morning) the other. Also, mix up the sets and reps so you aren't putting the same types of stresses on your body each time.

Practical example: On Day 1, following TSP, do lunges, 3 sets of 3 reps. On Day 5, do Romanian deadlifts, 5 sets of 5 reps. Switch things around after six

weeks. Don't push yourself to your limits. After each set, you should feel as if you've left two or three reps in the tank.

For abs, I recommend the same approach—pick one exercise for Day 1, another for Day 5, and use different combinations of sets and reps each day.

Conversely, I recommend that you restrict energy-systems work to non-TSP days. You don't need to push too hard here—15 minutes of interval training two or three times a week is plenty. Any more than that, and you run the risk of incomplete recovery between TSP sessions, and thus overtraining.

A quick note on loading

I know you're anxious to start the program, and I'm anxious to show you what to do and how to do it. But there's just one more thing. You'll notice that each exercise in the charts has a notation called "% 1RM." You probably know that means the percentage of your one-rep max in that particular lift. So if your 1 RM is 300 pounds in that exercise, and the chart says to use 80 percent of that max, then you'd use 240 pounds.

Simple, right?

But there's a complication: You won't know your 1RM in most of those lifts unless you do a separate series of tests for them. You've already done six RM tests, and if you're sick of them, I understand. So I'll throw this out: It's okay to estimate what your 1RM would be in these lifts. Through trial and error, you should figure out the right weights to use for each exercise by the second week of each six-week phase.

Phase 1: weeks 1-6

Day 1

Focus: maximal strength

Emphasis: lockout and mid-lift

Exercise	Sets	Hold/Reps	Rest (seconds)	%of 1RM	Bench press hand position
A1 BB bench press supramaximal hold	**4**	8 seconds	**60**	125	Weakest in 1RM test
A2 BB partial bench press (top)	**4**	3	**75**	**80**	Weakest in 1 RM test
A3 Wide-grip pull-up or lat pulldown	**4**	3	**75**	**80**	n/a
B1 EZ bar skullcrusher	**4**	3	**80**	**60**	n/a
B2 DB decline pullover	**4**	3	**80**	**60**	n/a
B3 Standing hammer curl	**4**	3	**80**	**60**	n/a

Notes:

The exercises denoted with letters (A1, A2, etc.) are parts of supersets. But these are supersets with designated rest intervals between each exercise. So in the "A" exercises in this chart, you'd do the supramaximal hold, rest 60 seconds, do the partial bench press, rest 75 seconds, do the pull-ups or pulldowns, rest 75 seconds, and repeat the sequence until you've completed all four sets of each exercise. Then you move on to the "B" exercises.

Exercise notes

Barbell bench press supramaximal hold

As described in the introduction to TSP: Bench Press, you want to hold the bar with the designated grip two to three inches below the lockout position. You'll have a slight bend in your elbows, but other than that, your goal here is to achieve perfect form for the finishing position of the bench press.

Barbell bench press supramaximal hold

Barbell partial bench press (top)

Lower the barbell to the halfway point before pressing back up. This will allow for large training loads, and it'll minimize shoulder stress. If available, set pins in a power rack at the halfway point and rest the barbell on the pins before pressing back up.

EZ bar skullcrusher

Perform on a decline and use a shoulder-width grip.

Dumbbell decline pullover

Make your hand position just wider than shoulder-width. Go back as far as your shoulders allow.

Standing hammer curl

No fancy variations—just the standard exercise, curling both dumbbells at the same time (don't alternate arms, in other words).

Day 2

Focus: active recovery

Exercise	Sets	Reps	Rest (seconds)	%of 1RM	Bench press hand position
DB bench press	**2**	**50**	180	**25**	**n/a**
Wide-grip pulldown	**2**	**50**	180	**25**	**n/a**

Day 3

Focus: speed-strength

Emphasis: entire range of motion

Exercise	Sets	Reps	Rest (seconds)	%of 1RM	Bench press hand position
Explosive push-up	**7**	**3**	60	Body weight	Weakest in push-up test
Chest-supported row	**7**	**3**	60	60	n/a
DB front raise	**7**	**3**	60	60	n/a
1/4 dip	**7**	**3**	60	60	n/a

Note: These are "straight sets," rather than supersets. So you'll do all seven sets of each exercise before moving on to the next.

Exercise notes

Explosive push-up

Described in "Testing" section earlier in this chapter.

Chest-supported row

Use a pronated grip with your elbows held out wide.

Dumbbell front raise

Keep your palms facing each other throughout the movement and don't drop your arms all the way down. Keep a slight flex in your shoulder joint to keep tension on your anterior deltoids.

1/4 Dip

Only lower yourself down 4-6 inches to empasize your triceps.

Day 4

Off

Day 5

Focus: maximal strength

Emphasis: bottom of lift; starting strength

Exercise	Sets	Reps	Rest (seconds)	%of1RM	Bench press hand position
A1 BB partial bench press w/isometric hold (bottom)	**5**	**3**	**90**	**85**	Weakest in 1RM test
A2 DB face down side raise	**5**	**3**	**90**	**85**	n/a
B1 Half dip	**5**	**3**	**90**	**85**	n/a
B2 DB decline pullover	**5**	**3**	**90**	**85**	n/a
B3 DB external rotation	**5**	**3**	**90**	**85**	n/a

Exercise notes

Barbell partial bench press with isometric hold (bottom)

Hold the load at your chest for three seconds before pressing halfway up. You won't straighten your arms completely until you're racking the weight following your final rep of each set.

Dumbbell face down side raise

Set the bench angle to 45 degrees. Don't let your arms drop all the way down during the lowering portion.

Half dip

Lower yourself halfway down before pressing back up. Hold a dumbbell between your feet for added resistance.

Dumbbell external rotation

You can do one- or two-arm variations. The one-arm version is usually done sitting on a bench, with one foot up on the bench. That foot sits flat, so the top of that knee is more or less shoulder-level. Brace the elbow of your working arm against that knee (right elbow on right knee, or left on left). With your elbow bent 90 degrees, rotate your upper arm as high as you can, then slowly lower it as far as you can. Remember that this is an exercise designed to isolate the action of external shoulder rotation, so you get no extra points by moving your torso to exaggerate the range of motion.

Start with your weaker arm (probably your left if you're right-handed), do all the reps, then switch arms and repeat.

Day 6

Focus: Active recovery; same routine as Day 2

Day 7

Off

Progression for weeks 2-6:

Day 1: Increase the load 2 percent on each exercise each week.

Day 3: Add one set to each exercise each week.

Day 5: Decrease the rest period by five seconds for each set each week.

Phase two: weeks 7-12

Day 1

Focus: maximal strength

Emphasis: lockout and mid-lift

Exercise	Sets	Hold/Reps	Rest (seconds)	%of 1RM	Bench press hand position
A1 BB bench press supramaximal hold	**5**	8 seconds	**60**	135	Second-weakest in 1RM test
A2 BB partial bench press (top)*	**5**	3	**75**	**80**	Second-weakest in 1 RM test
A3 Chest-supported row	**5**	3	**75**	**80**	n/a
B1 DB decline triceps extension	**5**	3	**80**	**60**	n/a
B2 Upright power row	**5**	3	**80**	**60**	n/a
B3 EZ bar reverse curl	**5**	3	**80**	**60**	n/a

* Set pins one notch lower than you did in Phase One. In other words, increase the range of motion by the smallest amount your apparatus allows, probably two to three inches.

Exercise notes

Chest-supported row

Use a neutral grip and keep your elbows close to your sides as you pull.

Dumbbell decline triceps extension

Set the bench to a decline of 20 to 30 degrees (or prop up the front end of a flat bench with plates). Then do a standard lying extension with two dumbbells, your palms facing each other.

Upright power row

Start by leaning slightly forward with your hands pronated. Extend your trunk back as you pull while turning your hands into a neutral position.

EZ bar reverse curl

Keep your elbows close to your sides as you curl. Stop short of full flexion.

Day 2

Focus: active recovery

Exercise	Sets	Reps	Rest (seconds)	%of 1RM	Bench press hand position
DB incline bench press	**2**	**50**	180	**25**	**n/a**
Chest-supported row	**2**	**50**	180	**25**	**n/a**

Day 3

Focus: speed-strength

Emphasis: entire range of motion

Exercise	Sets	Reps	Rest (seconds)	%of1RM	Bench press hand position
Explosive push-up	**8**	**3**	**60**	Body weight	Second-weakest in push-up test
Wide-grip pull-up or pulldown	**8**	**3**	**60**	50	n/a
High pull	**8**	**3**	**60**	50	n/a
Elbows out extension	**8**	**3**	**60**	50	n/a

Exercise notes

Wide-grip pull-up or pulldown

Use the widest grip that your bar allows.

High pull

From a hang position, pull the barbell and go up on your toes when the barbell is in its highest position. You can use a barbell or dumbbells.

Elbows-out triceps extension

Set the bench incline at 45 degrees. Keep your elbows pulled up toward the top of your head throughout the movement.

Day 4

Off

Day 5

Focus: maximal strength

Emphasis: bottom of lift; starting strength

Exercise	Sets	Reps	Rest (seconds)	%of1RM	Bench press hand position
A1 BB partial decline bench press w/isometric hold (bottom)	**3**	**3**	**75**	**85**	Second-weakest in 1RM test
A2 Chin-up	**3**	**3**	**75**	**85**	n/a
B1 Overhead triceps extension	**3**	**3**	**75**	**85**	n/a
B2 DB external rotation	**3**	**3**	**75**	**85**	n/a
B3 BB bent-over row	**3**	**3**	**75**	**85**	n/a

Exercise notes

Barbell decline partial bench press w. isometric hold (bottom)

Same as before, with the three-second hold at your chest, except now you're setting the bench at a slight decline.

Overhead triceps extension

You can do this as a French press, standing and lowering the bar or dumbbells behind your head. You can use a straight or EZ-curl bar. If you use two dumbbells, have your palms facing each other. Or you can do the cable version, using a rope attachment and leaning forward.

Dumbbell external rotation

Use whatever variation you didn't use in Phase 1. If you did sitting single-arm rotations, switch to the standing two-arm version. Be sure to stop short of full external rotation in order to keep tension on your muscles.

Barbell underhand-grip bent-over row

Utilize a palms-up, shoulder-width grip.

Day 6

Focus: Active recovery; same routine as Day 2

Day 7

Off

Progression for weeks 8 to 12:

Day 1: Increase the load 2 percent on each exercise each week.

Day 3: Increase the load 2 percent on each exercise each week.

Day 5: Add one set to each exercise each week, progressing from 3 to 8 sets of each exercise.

After 12 weeks ...

Repeat the 1RM bench-press test. Start with the grip that was strongest during your pre-program test. Even though you haven't trained that grip during this 12-week program, you can expect to see gains.

TSP: Deadlift

The deadlift is one of the most beneficial exercises known to man, a great way to build muscle and increase total-body strength. By no coincidence, it's also one of the hardest exercises. The harder an exercise is, the more your

ability to recover becomes a limiting factor.

But I've found a way to get around that limitation: By breaking up the lift into three components—the bottom, middle, and top of the movement—you can do more total work without risk of overtraining. That is, you can work on your deadlift three times a week instead of once or twice, without burning out.

The key to the deadlift is what we call the "posterior chain" which includes the muscles that make up that chain along with the other muscles that surround the chain. Everything in the back of your body, from your spinal erectors to your glutes, hamstrings, and calves must be made progressively stronger. If you want a great deadlift, way more than twice your body weight, you need those posterior-chain and surrrounding muscles to be super-strong.

But it's more than muscles; you have to make them strong in the specific movements involved in deadlifting. The main movement is hip extension—straightening your hips when they're bent forward. Back extension—straightening your spine when it's rounded—is also involved, although mainly as a movement you want to avoid. That is, you want your spine to move as little as possible, and that gets a lot harder when the weights get a lot heavier. You'll also perform movements at the ankles, knees, and even shoulder blades (which pull together in the middle of your back to complete a deadlift).

As I said, you can more thoroughly and safely develop all those movements by breaking the deadlift into three phases and training each phase with specific exercises.

Deadlift phases

Initial pull: This phase starts with the load resting ("dead") on the floor, and ends with the load just below the knees. As I'm sure you guessed, your ability to pull the weight through this first part of the range of motion is limited by your starting strength. There are two ways to improve starting strength;

1. Stand on a step when you lift. This puts the bar "below the floor"—lower than it would normally rest when you start the lift.
2. Lift a lighter weight as fast as possible. This helps you develop the acceleration speed to help get heavier weights through this part of the range of motion.

Mid-pull: Even if you have the starting strength to get a bar off the floor, you might fail to get it past your knees. This phase—getting the bar from just below your knees to just above them—is all about the strength in your lower back, glutes, and hamstrings. Two ways to improve your mid-pull:

1. Strengthen your pure hip-extension strength, using exercises like good mornings, hip-knee extensions, and back extensions.
2. Develop faster acceleration to get through the sticking point, using lighter weights at fast tempos.

Lockout: The final third of the movement challenges the strength of two sets of muscles: your glutes, which have to contract with walnut-cracking power to finish the deadlift movement; and your gripping muscles, which sometimes give out at the top of the lift. You'll develop your lockout strength with pin pulls, in which you pull a weight heavier than your 1 RM through the final inches of the range of

motion. You want to do the first rep of each set without wrist straps, to maximize the challenge to your grip strength. But you're allowed to use wrist straps on the other reps, since your grip will give out before you'll fully challenged your extensor-chain muscles.

The perfect deadlifl

From the outside, this looks like the simplest of the three power lifts. Grab heavy thing, lift heavy thing. What could be more straightforward? Well, as you probably know already, there's a lot more to it, starting with the set-up:

Grip: Your grip should be as narrow as possible. It's all about distance. The shorter the distance you have to pull the load, the higher your numbers will be. Quick demonstration to make my point: Stand up and push your arms out to your sides, as if you had a softball underneath each armpit. Look at the distance between your hands and the floor. Next, let your arms hang straight down at your sides. What happened? Your hands got much closer to the floor in the second position. Therefore, your grip should be as narrow as your stance allows in traditional deadlifts. This factor is already built in with sumo-style deadlifts, since your grip is inside your legs. That's why most lifters can lift more using the sumo style vs. traditional form—the pulling distance is shorter with your arms inside your legs rather than outside.

I also want you to use an overhand grip. That's with *both* hands. Yes, I know old-school deadlifters say to practice with the same grip you'd use in

competition—a mixed grip, one hand over the bar, one hand under—but I think it's important to use the non-mixed grip. You'll have more balanced strength in your shoulder girdle with both arms rotated the same direction, you'll develop more forearm strength, and you'll have less risk of a catastrophic injury, like a torn biceps.

Finally, don't use wrist wraps. Your hands and forearms need to handle the same loads as your extensor-chain muscles. (The one exception is for supramaximal loads, as I'll explain later in this section.)

Shin position: You've probably heard from a trainer or read in a magazine that you're supposed to start a deadlift with the bar up against your shins. I disagree. To lift a bar that's against your shins, you have to sink into a deep squat position, which is a disadvantage for monster pulls. If the bar starts out a few inches in front of your shins, you can start with your hips higher, and lift more off the floor.

Hips: Continuing with that thought, you want your hips as high as possible when you start the lift. This puts more of the burden on your hips, rather than your knees, and puts more emphasis on your hamstrings, glutes, and lower back, rather than your quadriceps. Collectively, those are stronger muscles than your quadriceps, and you want to engage them right from the start of the lift.

Lower back: Your lower back should be as tight as possible, locked into its naturally arched position. That's where it's strongest and most stable. If you round your lower back at the start of the lift, you have to straighten it as you lift. On a max lift, when you're pulling double or even triple your body weight, you'd be subjecting your spine to loads it was never meant to move. That doesn't mean

your lower back is inherently weak—in its naturally arched position, it can resist tremendous loads. But asking it to *move* those loads is a different story, one that will probably end badly, with a ruptured disk and the potential for lifelong pain and weakness. You avoid all that by keeping your back arched and tight. That puts a stretch on your hamstrings, priming them for a powerful contraction.

Upper back: It's often recommended that you should start the lift with your shoulder blades retracted—that is, pulled together in the middle of your back. Once again, I'll disagree with the conventional wisdom. First, it's unnatural. If you were climbing a tree or playing tug-of-war, would you take your shoulder blades out of the action by locking them down? No, of course you wouldn't. You wouldn't think about what your shoulder blades were doing, and you'd use them the way they're designed, letting them pull apart at the start of a pull and then retracting them at the end to complete the motion. The second problem is that it shortens your arms, meaning you have to pull the bar farther to complete each lift. What you want to do is the opposite: Start with your shoulder blades apart, which lengthens your reach and allows you to lift more weight by shortening your range of motion. (It's worth noting that the deadlift is the only powerlift that favors long-armed lifters, who are at a natural disadvantage in the bench press.)

Head: You should start and finish with your head elevated and tilted back slightly. There's no need to exaggerate this position so you're looking up at the ceiling. But you certainly want to avoid looking down while deadlifting, which could put a strain on your upper-back muscles.

Initial pull from floor:

- Once you get into proper position, take a deep breath to allow air into your abdominal region. This increases intra-abdominal pressure, which helps stabilize your spine and produce more force.
- With a tight grip, imagine that the load is glued to the floor. Visualize that the glue is wet and sticky, rather than solid and dry, and that it clings to the weights even as you pull them off the floor. This mental trick reminds you to keep pulling hard throughout the range of motion, rather than just at the beginning. An all-out pull from the floor will certainly get the bar moving, but will also throw off your form, and cause you to lose force as the bar rises. As I said, the lift has three phases, and you need to maintain your pulling force through all three.
- Start to squeeze your glutes together.

Mid-Pull:

- Now that the load is elevated, thrust your hips forward and lean back with your shoulders.
- Keep squeezing those glutes.

Lock-out:

- As you approach lock-out, keep leaning back. It's okay to lead with your head at this point, extending it a bit further back.
- Squeeze your glutes as hard as you can to finish the hip extension.

Finish: From the lock-out position, you want to get the weight back to the floor as quickly as possible. There's no need to do this slowly, and in fact most of the

deadlifting injuries I've seen happen when the lifter is lowering the bar slowly during multi-rep sets.

Testing

Unlike the bench-press program, you only need to test yourself in one lift before beginning. Warm up thoroughly, as described in the bench-press section, and then work up to a 1RM using the form described on the previous pages. Remember, this is your 1RM with an overhand grip, rather than the mixed grip, so it may be slightly lower than your previous PR.

Upper-body exercises, energy-systems work, and recovery

TSP: Deadlift has ab exercises built-in, so you don't need to worry about adding those. And you'll do some energy-systems work in between your weight workouts, to facilitate recovery, so that's built-in too.

You should add some stretching on those days, following your brief recovery run. If you can get someone skilled in sports massage to work on your lower-body muscles, even better. (I'm sure you'll be relieved to note that I don't recommend ice massage for your gluteals.)

You will need to add some upper-body work, however. I recommend doing a few sets of bench presses and rows following your TSP workout on Day 1, and some pull-ups, chin-ups, or lat pulldowns, along with either shoulder presses or dips, and external rotations, after your TSP training on Day 5. As I suggested

for TSP: Bench Press, you can do three sets of three reps of each upper-body exercise on Day 1, and five sets of five on Day 5. The actual exercise selection isn't all that important. Just switch the exercises around after six weeks.

Phase 1: weeks 1-6

Day 1

Focus: maximal strength

Emphasis: lockout and mid-lift

Exercise	Sets	Reps	Rest (seconds)	%of 1RM
A1 Supramaximal partial deadlift	**4**	**2-3**	**60**	125
A2 Deadlift lockout	**4**	**3**	**75**	**80**
A3 Lying leg curl	**4**	**3**	**75**	**80**
B1 Side bend	**4**	**3***	**60**	**80**
B2 Cable, band or plate hip adduction	**4**	**3***	**60**	**80**
B3 Seated calf raise	**4**	**3**	**60**	**80**

* each side

Exercise notes

Supramaximal partial deadlift

Set the bar up on a rack or supports at upper-thigh level—lockout height. Grab the bar with an overhand grip and step back from the rack. Push your hips back slightly so the bar descends a few inches, then straighten back up to lockout position. Do 2 to 3 reps as fast as possible. You can use wrist straps on all reps the first time you do the workout,

but after that, try to get at least one rep without the straps, then rack the weight, wrap the straps around the bar, and do the rest.

Deadlift lockout

Set the pins on your squat rack or supports so the bar rests just below knee-level. Do your reps from that position to lockout.

Side bend

Stand holding a dumbbell in one hand, bend to the side holding the weight, and straighten. Do all your reps and then switch sides. You want this to be a strict lateral movement to develop the muscles on the sides of your torso; don't twist at the waist or hips.

Cable, plate or machine hip abduction

This is a very simple movement—you want to lift one leg out to your side while pushing or pulling a challenging load. It's best to do it with a cable machine: Attach an ankle strap to the low pulley of a cable-crossover station, and position yourself sideways to the weight stack, with the working leg farther from the stack. Lift your leg straight out to your side as high as you can without shifting your posture. At most, you'll move it about 45 degrees away from your non-working leg.

A second option is to do a plate slide, in which you push a heavy weight plate across the floor with the outside edge of the foot of your working leg.

As a last resort, you can use your gym's hip-abduction machine. Yes, that's the leg-spreading machine.

Day 2

Focus: recovery

Do 12 to 15 minutes of light jogging or uphill walking to get the blood flowing into your lower body. Stretch your entire body.

Day 3

Focus: speed-strength

Emphasis: entire range of motion

Exercise	Sets	Reps	Rest (seconds)	%of 1RM
Good morning	**10**	**3**	**60**	**50**
Reverse hyper	**10**	**3**	**60**	**50**
Reverse crunch	**10**	**3**	**60**	**50**
Standing calf raise	**10**	**3**	**60**	**50**

Exercise notes

Partial good morning

Stand with your feet as wide as possible with your feet slightly angled out. While keeping your chest high and lower back arched, push your hips back and let your knees slightly bend.

Reverse hyper

Keep your legs as wide as possible. Use ankle weights if your leg weight is too light.

Reverse crunch

From a straight-leg position, pull your knees in towards your chest and roll your hips up.

You can also perform this exercise on a slant board.

Day 4

Focus: recovery

Same as Day 2.

Day 5

Focus: maximal strength

Emphasis: bottom of lift; starting strength

Exercise	Sets	Reps	Rest (seconds)	%of 1RM
A1 Elevated-platform deadlift	5	3	75	85
A2 Woodchop	5	3*	75	85
A3 Seated leg curl	5	3	75	85
B1 High pull	5	3	75	85
B2 Back extension	5	3	75	85
B3 Donkey or standing calf raise	5	3	75	85

* each side

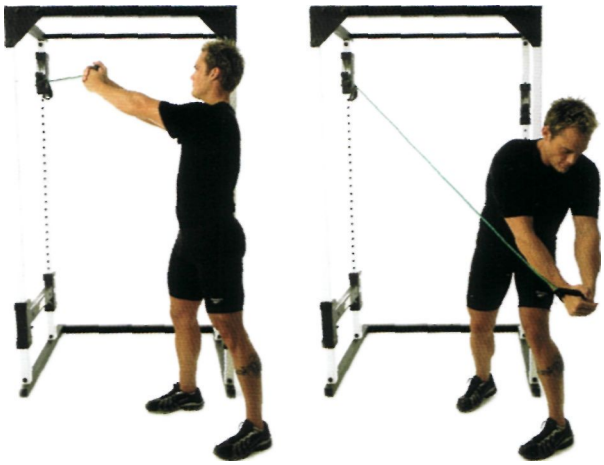
Exercise notes

Elevated-platform deadlift

Set up a box or weight plates that give you a sturdy platform about four inches off the floor, while allowing you to roll the barbell into the proper starting position. In other words, the plates on the barbell have to go past the sides of the box or step. (An aerobics step is just the right width for this.) You'll have to squat down a bit lower to lift the weight and return it to the starting position, but other than that your form should be identical to your form on a traditional deadlift.

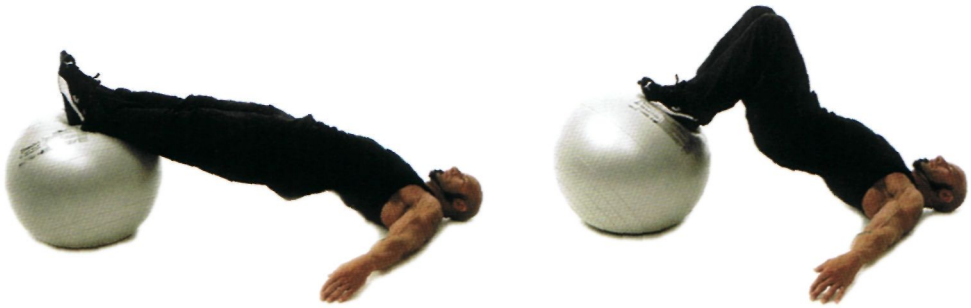
Woodchop

Attach a rope handle to a high cable pulley, usually on a cable-crossover station. Stand to the side of the handle and reach across your body to grab it with both hands. Your hands should be near your head on the side closest to the weight stack. With your arms straight, pull the handle down and across your body as if you were chopping wood, with your hands ending up outside the knee farthest from the weight stack. Focus on your abdominal region as you do this, trying to complete the movement using nothing but those muscles. Do all your reps, then switch sides and repeat without resting in between.



Seated leg curl

If your gym doesn't have this machine, you can do a Swiss ball leg curl: Lie on your back with your feet on the ball, and your body elevated and forming a straight line from ankles to neck. Now pull your feet in toward your butt, squeezing the hamstring muscles.



High pull

Snap your hips forward while simultaneously pulling up on the bar with your upper back and traps. Don't try to pull with your biceps; your elbows will bend naturally from the momentum of the bar rising. Go up on your toes as you accelerate the barbell upward.

Back extension

Hold a dumbbell or weight plate in your hands for added resistance.

Day 6

Focus: recovery

Same as Day 2.

Day 7

Off

Progression for weeks 2 to 6:

Days 1 and 3: Increase the load 2 percent on each exercise each week.

Day 5: Keep the loading the same each week, but decrease your rest periods by 5 seconds on each set of each exercise each week.

Phase 2: weeks 7-12

Day 1

Focus: maximal strength

Emphasis: lockout and mid-lift

Exercise	Sets	Reps	Rest (seconds)	%of 1RM
A1 Partial good morning	**5**	**3**	**70**	**80**
A2 Hip-knee extension	**5**	**4**	**70**	**80**
A3 Standing calf raise	**5**	**4**	**70**	**80**
B1 Sumo-style deadlift lockout	**5**	**4**	**70**	**80**
B2 Cable, band or machine adduction	**5**	***4****	**70**	**80**
B3Ab wheel	**5**	**4**	**70**	**80**

* each side

Exercise notes

Hip-knee extension

Be sure you squeeze your glutes and lock out your knee joint when your legs are completely extended. Use ankle weights *or* hold a dumbbell between your feet for added resistance.

Sumo-style deadlift lockout

As in the deadlift lockout described earlier, start with the bar on pins or supports just above knee-level. Keep your lower back tight and arched.

Cable, band or machine hip adduction

This is the opposite of the hip abduction described earlier. If you're using a cable station, start with your working leg nearest the weight stack, and lifted straight out to your side toward the stack. Pull the cable straight down toward your nonworking ankle, crossing your working leg in front of your nonworking leg at the finish.

You can also do the plate-slide version of this exercise.

As a last resort, your gym probably has a hip-adduction machine, the one where you start with your knees spread and then pull them together.

Cable, band or machine hip adduction (continued)

Ab wheel

Roll out as far as your strength allows.

Day 2

Focus: recovery

Do 12 to 15 minutes of light jogging or uphill walking to get the blood flowing into your lower body. Stretch your entire body.

Day 3

Focus: speed-strength

Emphasis: entire range of motion

Exercise	Sets	Reps	Rest (seconds)	%of 1RM
Deadlift	**7**	**3**	**60**	**55**
DB Romanian deadlift	**7**	**3**	**60**	**55**
Swiss ball crunch	**7**	**3**	**60**	**55**
Standing calf raise	**7**	**3**	**60**	**55**

Exercise notes

Deadlift

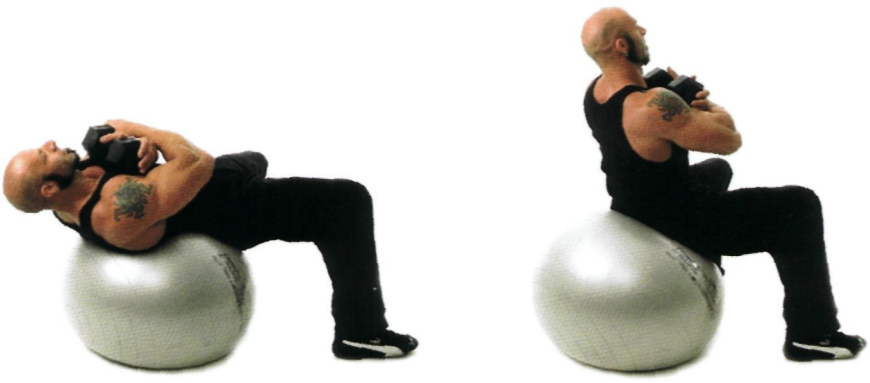
Use the traditional stance, with your arms just outside your legs. Lift the weight as fast as possible, and make sure the bar rests briefly on the floor before each rep.

DB Romanian deadlift

Initiate this movement by pushing your hips back. Let your knees bend slightly as you lower the dumbbells just below your knees.

Swiss ball crunch

Hold a dumbbell or plate across your chest. Stretch back as far as the ball allows and then crunch up until your upper back lifts off the ball.



Day 4

Focus: recovery

Same as Day 2.

Day 5

Focus: maximal strength

Emphasis: bottom of lift; starting strength

Exercise	Sets	Reps	Rest (seconds)	%of1RM
A1 Sumo-style supramaximal hold partial deadlift	**3**	**2-3**	**60**	125
A2 Sumo-style elevated-platform deadlift	**3**	**3**	**75**	**80**
A3 Cable or dumbbell side bend	**3**	**3***	**75**	**80**
B1 Jump shrug	**4**	**3**	**75**	**80**
B2 Reverse lunge	**4**	**3***	**75**	**80**
B3 Seated calf raise	**4**	**3**	**75**	**80**

* each side

Exercise notes

Sumo-style supramaximal partial deadlift

This is the same as the Sumo-style deadlift lockout as described earlier.

Sumo-style elevated-platform deadlift

Use a sturdy step or plates that elevate your feet about two inches off the floor. This isn't a pure sumo-style deadlift, though; you want your feet slightly wider than shoulder width,

rather than the exaggerated width of sumo deads. And your grip is just inside your legs, rather than with your hands right next to each other on the bar.

Cable or dumbbell side bend

You can do the dumbbell side bend described earlier, or do it with a stirrup handle attached to a low cable pulley. If you do the latter, stand sideways to the weight stack, holding the handle with the arm closest to the stack. Bend toward the stack, then straighten.

Jump shrug

This is very similar to a high pull. The only difference is that you don't pull the bar up to your chest. Keep your arms relatively straight while pulling the barbell up with your traps. You won't elevate off the floor, but you should go up as high as you can on your toes.

Day 6

Focus: recovery

Same as Day 2.

Day 7

Off

Progression for weeks 8 to 12:

Days 1 and 5: Increase the load 2 percent on each exercise each week.

Day 3: Keep the loading the same each week, but add one set to each exercise each week.

After 12 weeks ...

Repeat the 1RM deadlift test.

TSP: Squat

When most lifters think of squats, they think of quadriceps. As in, "If you want big quads, you have to squat big weights." That could be true enough, considering that the alternative quad-builders are leg presses and leg extensions, neither of which is worth any serious investment of your time or energy.

But let's look at the question another way. If you wanted to squat big weights, which muscles do you think would be most important for that goal? The answer isn't "quadriceps"; their role in the squat is grossly overrated. If you want the kind of strength that requires you to empty a plate stand for your max-effort sets, you'll need super-strong hamstrings, glutes, and lower back muscles. Sure, your quads

will get bigger and stronger, too, but they don't need to be emphasized.

The real action in the squat takes place in the muscles surrounding your hip joints. That's where your biggest bones and strongest muscles converge to handle the most extreme feats of strength and power your body is capable of performing. Your knee joints are important—it's impossible to squat heavy weights if they're injured or unstable—but even the healthiest knees would come apart if you constantly forced them to take the brunt of the load when you have twice your body's weight sitting on your shoulders.

Proper form, thus, is vital. I won't say it's more important to get the form right on a squat than it is on a deadlift or bench press, but I will say that the squat offers more opportunities for injury. On the bench press your shoulders are your primary concern, with less risk to your elbows and wrists. On the deadlift, it's your lower back. But on a squat, you have at least as much risk to your back as you do with a deadlift, on top of the danger to your knee joints, since you have to bend them more than 90 degrees to get to the bottom position.

That doesn't mean squats are dangerous to your back or knees, if done correctly. Here's how to master the form that allows you to move monster weights without fear.

The perfect squat

1. **Barbell position:** If you consider yourself a bodybuilder, you've probably done squats in what we call the "high bar" position—that is, resting on

your upper traps. But in this program you'll squat with the bar lower on your traps. The reason is simple physics. Your hips are your axis of rotation, and the bar is the point of resistance. The closer the point of resistance is to the axis of rotation, the less force you need to move the object. That means you can move a heavier object, or, to be more specific, put more plates on the bar. This isn't a gradual effect; you should be able to squat 10 percent more weight immediately when you switch from the high-bar to the low-bar position.

So your first step is to set the pins on the squat rack to this lower position, place the barbell on the pins, and then load it with your starting weight.

2. **Grip:** Once you get the barbell in proper position, step under it, and set it on your upper back/lower traps so it rests on the groove at the base of your rear delts. Before you step back from the rack, you have to pick the grip that works best for you with the bar in this lower position. Unlike the high-bar position, your shoulders are going to be actively involved in holding the bar in place. (You'll also be leaning forward a bit more to give the bar a flat place to rest.) In my view, there's no single grip that works for everyone, which I why I suggest you pick the grip that feels easiest on your shoulder joints. However, you should know that a narrow grip will keep your shoulders healthier than a wide grip. After finding the best position, grip the bar tightly across your upper back and keep your elbows pulled up. This helps tighten up your upper-back region. The tighter your

body, the more you'll be able to squat.

3. **Step-back:** Now that you've got the barbell in position, and your grip is set, you need to step back from the rack. Don't underestimate the importance of step-back form. You want to take one small step back with each leg, without allowing any shift in the load on your back. Pay attention to these details; if you groove proper form in your step-back, it'll be easier to master the mechanics of the actual squat.
4. **Stance:** After stepping back, it's time to get your feet into proper position. Regardless of your height or bone length, you'll do best with a wide stance. The reason, once again, relates to physics. A wide stance immediately drops the bar closer to the floor. That shortens your range of motion, allowing you to lift heavier weights. Your feet should be pointed straight ahead, or very close to it. Some lifters rotate their feet and point their toes away from the midline of their bodies, but I don't recommend it. When your feet are pointed outward, your base of support is weakened, making it more likely that you'll fall forward or lose your balance. Another advantage of having your feet pointed straight is that it allows you to push against the outsides of your feet as you descend. This pushing helps you stay tight and forces you to recruit your hip muscles to a greater extent. As you push outward, your knees should also go out as far as possible to minimize strain. This also helps you avoid the worst-case scenario for a squatter: knees that buckle in. Not only is it dangerous to your knees, it activates your inner-thigh muscles, your adductors, at the expense of

your outer-hip muscles, which work in tandem with your powerful gluteus maximus and hamstrings.

5. **Inhale deeply:** Now that you've got the barbell on your back, your hands in their best placement, your grip tight, and your feet set, it's time to descend ... almost. First, suck as much air as possible into your body. Your goal is to increase your intra-abdominal pressure, which does two important things: It helps stabilize your spine, and it widens your torso. The wider your torso, which is your base of support, the bigger the weights you'll be able to squat. That's precisely the reason why many powerlifters have such large waistlines—it creates a wider base. But there's no need to add fat mass just so you can lift heavier weights. The price you'll pay in terms of your health is much greater than whatever benefit you'll gain from increasing your strength. So let's focus on adding weight to the bar, not your waistline.
6. **Descent:** After sucking air into your body, you should initiate the descent by pushing your hips back. Inexperienced squatters typically start by bending their knees, which not only limits their strength, it puts a hurt on their knees. As I said above, the key to a big squat is minimizing the work your knees have to do while maximizing the role of your glutes and hamstrings. So, with your breath held, push your hips back and slowly descend until your hips are just below your knees. Your knees should not push forward during any portion of the descent. Your lower back must remain arched and tight.

7. **Lift:** Now that you've reached the bottom, there's just one thing left: lifting the load. To begin your ascent, think of pushing your upper back into the bar as you thrust your hips up and forward. Let your knees take care of themselves—you want them to come along for the ride, rather than force the action.
8. **Exhale:** Once you reach the top, exhale. If you let go of your breath before then, you'll lose strength and compromise your spinal stability.

Posterior motives

The squat, like the bench press, requires huge levels of maximal strength, explosive strength, and reversal strength. And, like the deadlift, it calls for an incredibly strong posterior chain. And it's unique among the three powerlifts in its requirement for posterior-chain strength in combination with reversal strength. So let's focus on those qualities for a minute.

No matter what exercise you're doing, you're helped or limited by the efficiency and effectiveness of reversible muscle actions. Technically, the process of reversing muscle actions is called the *stretch-shortening cycle.* Using the squat as an example, you stretch the major muscles of your posterior chain in your descent, storing elastic energy in those muscles and their tendons. That energy releases as you lift, allowing the muscles and tendons to shorten, *or* contract.

That's why muscles can produce more force when they're stretched before they contract. The wide-stance form I described in the previous section—with you pushing against the outsides of your feet and forcing your knees out as

you descend—puts your lower-body muscles and tendons in an ideal position to stretch and then contract. That is, you're putting the deepest stretch into the strongest muscles, provoking as a response the most powerful reflex action possible. If you use a narrower stance, or turn your feet outward, or start the action with your knees going forward instead of your hips going back, you're minimizing the stretch-shortening reflex, and limiting your potential in the squat.

Now let's take a look at the 12-week program that will catapult your squat numbers higher than you ever thought possible.

Testing

As with the deadlift, you only need to do one test before you begin the program: Find your 1RM in the squat, using the form described.

Phase 1: weeks 1-6

Day 1

Focus: maximal strength

Emphasis: lockout

Exercise	Sets	Hold/Reps	Rest (seconds)	%of 1RM
A1 Supramaximal squat	**3**	**8** sec.	**60**	125
A2 Partial (1/4) squat	**3**	**3**	**75**	**82**
A3 Lying leg curl	**3**	**3**	**75**	**82**
B1 Side bend	**3**	**3***	**60**	**82**
B2 Cable, plate or machine abduction	**3**	**3***	**60**	**82**
B3 Seated calf raise	**3**	**3**	**60**	**80**

* each side

Exercise notes

Supramaximal squat

Unrack the weight, step back, set your feet in the wide stance described earlier, and push your hips back slightly, allowing an even slighter bend in your knees. You should descend just a few inches before the hold.

Partial (1/4) squat

Use the same form, but this time squat down about one-quarter of the full squat distance. Note: That doesn't mean a quarter of the way to the floor. It means a quarter of the distance you'd descend to get your thighs just slightly lower than parallel to the floor.

Day 2

Focus: recovery

Do 12 to 15 minutes of light jogging or uphill walking to get the blood flowing into your lower body. Stretch your entire body.

Day 3

Focus: speed-strength

Emphasis: entire range of motion

Exercise	Sets	Reps	Rest (seconds)	%of1RM
100-meter sprint*	**4**	**1**	240	**n/a**
Good morning	**10**	**3**	**60**	**50**
DB Romanian deadlift	**10**	**3**	**60**	**50**
Reverse crunch	**10**	**3**	**60**	**50**

* If you can't get to a road or track for sprints, run or pedal as hard as possible for 12 seconds.

Exercise notes

Good morning

You can use the low-bar position on your back. Since you're using a light load, you want to lift the weight fast, coming up from the bottom position as explosively as possible with good form. But don't try to lower the weight quickly; bend from the hips deliberately and under full control, pause briefly, then snap your hips forward as you return to the starting position.

Day 4

Focus: recovery

Same as Day **2.**

Day 5

Focus: maximal strength

Emphasis: bottom of lift; starting strength

Exercise	Sets	Reps	Rest (seconds)	%of1RM
A1 BB box squat	**4**	**3**	**75**	**85**
A2 Ab wheel	**4**	**3**	**75**	**85**
A3 Single leg Romanian deadlift	**4**	**3***	**75**	**85**
B1 Iso-hold lunge	**4**	**3***	**75**	**85**
B2 Back extension	**4**	**3**	**75**	**85**
B3 Standing or donkey calf raise	**4**	**3**	**75**	**85**

* each side and pause 3 seconds in bottom position

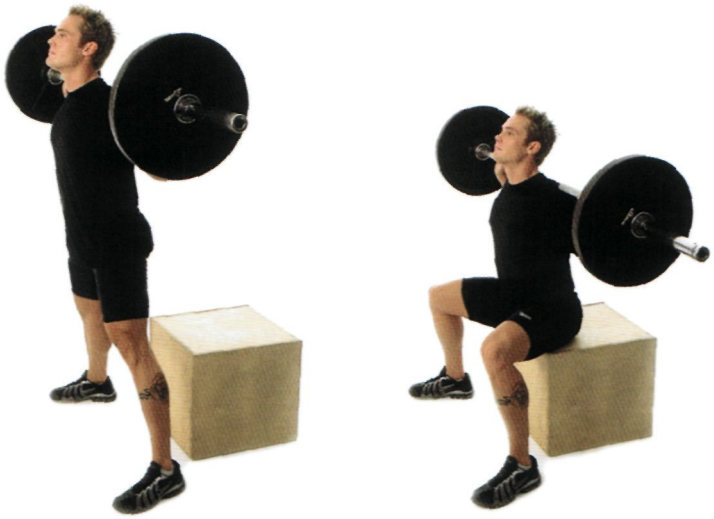
Exercise notes

Box squat

There's nothing more counterintuitive for a lifter than sitting down on a box with a loaded barbell on your back. But it's an amazing exercise for perfecting your squat. First you have to find a box or bench that allows you to sit so your hips are slightly lower than your knees, which is the bottom position of a competition squat. If you can't find a box or bench that allows you to sit down that far, you have to use what you have available.

(If the closest apparatus you can find is a bit lower than that, you can always use pads or boards to lift it up to your desired height. Just make sure you don't do anything that compromises the sturdiness of the box.)

Finding the right box is the most difficult job you'll have. The actual exercise is simple: You load a barbell, and do a squat with the form I described (wide stance, toes forward, bar sitting low on your shoulders). The only difference is that you put the box behind you, and sit down on it in the bottom position. Then you stand up.



Single leg Romanian deadlift

This is a partial deadlift in which you start by holding the dumbbells at arm's length at your sides. While standing on one leg, push your hips back and allow the dumbbells to descend until they're just below your knees. Keep your lower back tight and in its naturally arched position. Push your hips forward to return to the starting position. Hold

the bottom position for 3 seconds before returning to the starting position.

Iso-hold lunge

This is similar to a traditional lunge. The difference is that you should hold the bottom position for 3 seconds before standing up as hard and fast as you can. Your back knee should be 1-2 inches off the floor during the hold. Keep your torso as vertical as possible. Alternate legs with each rep.

Day 6

Focus: recovery

Same as Day 2.

Day 7

Off

Progression for weeks 2 to 6:

Days 1 and 5: Increase the load 2 percent on each exercise each week.

Day 3: Keep the loading the same each week, but decrease your rest periods by 5 seconds on each set of each exercise each week, including the sprints.

Phase 2: weeks 7-12

Day 1

Focus: maximal strength

Emphasis: lockout

Exercise	Sets	Hold/Reps	Rest (seconds)	%of1RM
A1 Supramaximal squat	**4**	**6** sec.	**75**	**84**
A2 Partial (1/4) squat	**4**	**2**	**75**	**84**
A3 Seated leg curl	**4**	**2**	**75**	**84**
B1 Reverse crunch	**4**	**2**	**75**	**84**
B2 Cable, plate or machine abduction	**4**	**2***	**75**	**84**
B3 Standing calf raise	**4**	**2**	**75**	**84**

* each side

Day 2

Focus: recovery

Do 12 to 15 minutes of light jogging or uphill walking to get the blood flowing into your lower body. Stretch your entire body.

Day 3

Focus: speed-strength

Emphasis: entire range of motion

Exercise	Sets	Reps	Rest (seconds)	%of1RM
40-meter sprint*	**6**	**1**	120	**n/a**
Sumo-style deadlift	**8**	**3**	**60**	**50**
Ab wheel	**8**	**3**	**60**	**50**
Lying leg curl	**8**	**3**	**60**	**50**

* If you can't get to a road or track for sprints, run or pedal as hard as possible for 6 seconds.

Day 4

Focus: recovery

Same as Day 2.

Day 5

Focus: maximal strength

Emphasis: bottom of lift; starting strength

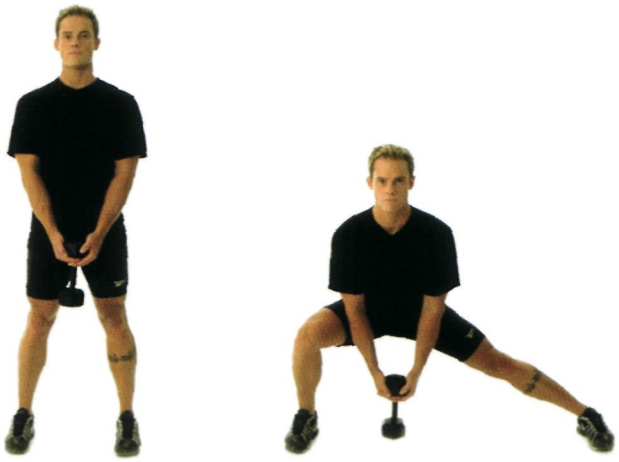
Exercise	Sets	Reps	Rest (seconds)	%of 1RM
A1 Iso-hold lunge	4	2*	75	85
A2 Side bend	4	4*	75	85
A3 Side lunge	4	4*	75	85
B1 Box squat	4	4	75	85
B2 Single leg back extension	4	4*	75	85
B3 Seated calf raise	4	4	75	85

* each side and pause 3 seconds in bottom position

Exercise Notes

Side lunge

Start with a dumbbell held in front of you, or a barbell across your upper back. Step out to the side as far as possible and descend to the lunge position. Keep your torso as vertical as possible. Your knee should be directly over your foot at the end of the movement. You should feel this movement in your inner thigh area.



Single leg back extension

Perform this exercise as described earlier for the back extension description. The difference is that you only work one leg at a time.

Day 6

Focus: recovery

Same as Day 2.

Day 7

Off

Progression for weeks 8 to 12:

Days 1 and 3: Increase the load 2 percent on each exercise each week. On the sprints on Day 3, decrease the rest periods between each sprint by 5 seconds each week. (That is, rest 120 seconds between sprints in Week 7, 115 seconds

in Week 8, 110 seconds in Week 9, etc.)

Day 5: Keep the loading the same each week, but decrease your rest periods by 5 seconds on each set of each exercise each week.

TSP: Multi-Lift Programs

Now you know how to do three similar but distinct programs, one each for bench press, deadlift, and squat. But what if you want to improve your performance in all three of the lifts simultaneously, or two of the three? Or let's say you're looking to build total-body strength and muscle mass, with your numbers in the lifts themselves a secondary concern.

You're in luck. Almost everything you can do for one lift, you can do for two or three simultaneously.

I won't show you full 12-week programs for each possibility. Instead, I'll tell you the guidelines for combining parts of two or more programs, and then build two six-week programs as examples.

Some general guidelines:

- Before you start a multi-lift TSP program, test the lifts you're going to emphasize, using the guidelines and instructions in those sections. (The overall 1RM testing guidelines, which you should review before you test any of your lifts, are in the bench press section.) Yes, a veteran lifter can probably figure out the right weights to use without doing rigorous 1RM testing. I just think you'll get more out of the program if you're certain of

your strength in your lifts before you begin.

- After 12 weeks of TSP, test yourself again.
- If you want to emphasize two lifts, rather than three, you can combine bench press with squat or bench press with deadlift, but not squat with deadlift. The exercises are too similar, and the stress on your lower back and knees would be ridiculous.

Now for specific guidelines:

Combining bench press and deadlift or bench press and squat:

Combine the "A" exercises of each program for Day 1 and Day 5. For Day 3, use the first two exercises in each program. It's up to you which to do first. If one lift is comparatively weak, you probably want to do the exercises for that lift first. If it's a toss-up, you can alternate—sometimes doing the bench-press exercises first, sometimes doing the squat or deadlift exercises first.

Combining all three lifts:

Same as above, except you'll do the "A" exercises for bench press and deadlift on days 1 and 5 in weeks 1 to 6, and the "A" exercises for bench press and squat in weeks 7 to 12. (Or vice-versa; you can do the squat exercises the first six weeks, and the deadlift exercises in the next six.) On Day 3, you'll do the first two exercises for bench press and the first two exercises for deadlift in weeks 1 to 6, and the first two for bench press combined with the first two for squat in weeks 7

to 12.

For recovery, you can do both of the recommended protocols—several very light sets of upper-body lifts from the bench-press program and 12 to 15 minutes of light jogging or uphill walking from the squat and deadlift programs—or part of each.

Sample three-lift program

Weeks 1-6

Day 1

(Note: Exercises from the bench press program are designated "BP." I use "DL" for deadlift and "SQ" for squat.)

Exercise	Sets	Hold/Reps	Rest (seconds)	%of 1RM	Bench press hand position
BP A1 BB bench press supramaximal hold	**4**	8 seconds	**60**	125	Weakest in 1RM test
BPA2BB partial bench press (top)*	**4**	3	**75**	**80**	Weakest in 1RM test
BP A3 Wide-grip pull-up	**4**	3	**75**	**80**	n/a
DLA1 Supramaximal partial deadlift	**4**	2-3	**60**	125	n/a
DLA2 Deadlift lockout	**4**	3	**75**	**80**	n/a
DLA3 Lying leg curl	**4**	3	**75**	**60**	n/a

Sample three-lift program

Weeks 1-6

Day 3

Exercise	Sets	Reps	Rest (seconds)	%of1RM	Bench press hand position
BP Explosive push-up	**7**	**3**	**60**	Body weight	Weakest in push-up test
BP Chest-supported row	**7**	**3**	**60**	60	n/a
DL Sumo-style deadlift	**10**	**3**	**60**	50	n/a
DL DB Romanian deadlift	**10**	**3**	**60**	50	n/a

Sample three-lift program

Weeks 1-6

Day 5

Exercise	Sets	Reps	Rest (seconds)	%of 1RM	Bench press hand position
BPA1 BB bench press w/isometric hold	5	**3**	**90**	**85**	Weakest in 1 RM test
BPA2 DB upright power row	5	**3**	**90**	**85**	n/a
DLA1 Elevated platform deadlift	5	**3**	**75**	**85**	n/a
DLA2 Woodchop	5	**3***	**75**	**85**	n/a
DLA3 Seated leg curl	5	**3**	**75**	**85**	n/a

* each side

Sample three-lift program

Weeks 7-12

Day 1

Exercise	Sets	Hold/Reps	Rest (seconds)	%of 1RM	Bench press hand position
BPA1 BB bench press supramaximal hold	**5**	8 seconds	**60**	135	Second-weakest in 1RM test
BPA2 BB partial bench press (top)	**5**	3	**75**	**80**	Second-weakest in 1 RM test
BP A3 Chest-supported row	**5**	3	**75**	**80**	n/a
SQA1 Supramaximal squat	**4**	6 seconds	**60**	135	n/a
SQA2 Partial (1/4) squat	**4**	2	**75**	**84**	n/a
SQA3 Lying leg curl	**4**	2	**75**	**84**	n/a

Sample three-lift program

Weeks 7-12

Day 3

Exercise	Sets	Reps	Rest (seconds)	%of 1RM	Bench press hand position
BP Explosive push-up	**8**	**3**	60	Body weight	Ssecond-weakest in push-up test
BP Wide-grip pull-up	**8**	**3**	60	50	n/a
SQ 40-meter sprint	**6**	**1**	120	n/a	n/a
SQ Sumo-style deadlift	**8**	**3**	60	50	n/a

Sample three-lift program

Weeks 7-12

Day 5

Exercise	Sets	Reps	Rest (seconds)	%of 1RM	Bench press hand position
BPA1 BB decline partial bench press w/isometric hold	**3**	**3**	**75**	**85**	Second-weakest in IRMtest
BP A2 Chin-up or palms-up lat pulldown	**3**	**3**	**75**	**85**	n/a
SQA1 Iso-hold lunge	**4**	**2**	**75***	**85**	n/a
SQA2 Side bend	**4**	**4**	**75***	**85**	n/a
SQA3 Cable, plate or machine hip abduction	**4**	**4**	**75***	**85**	n/a

* each side

One more possibility, for the most advanced lifters

There is one more way to use TSP. Let's say you're primarily interested in the bench press, and want to do the entire 12-week program, including the supplemental exercises. But you aren't satisfied with merely maintaining your lower-body strength by doing a few sets of squats and deadlifts each week, as described in TSP: Bench Press.

Here's your plan:

Do the A and B exercises for the bench-press program, followed by the A exercises for either squat or deadlift. If you're equally interested in the squat and deadlift, you can do the A exercises for deadlift in weeks 1 to 6, followed by the A squat exercises in weeks 7 to 12.

That's a ton of work and stress on your body, so I recommend you limit all other physical activity during those 12 weeks, other than the recommended recovery protocols (and you might want to cut those in half to avoid overdoing it).

Wisdom don't consist
in knowing more that is new,
but in knowing less that is false.

Josh Billings

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