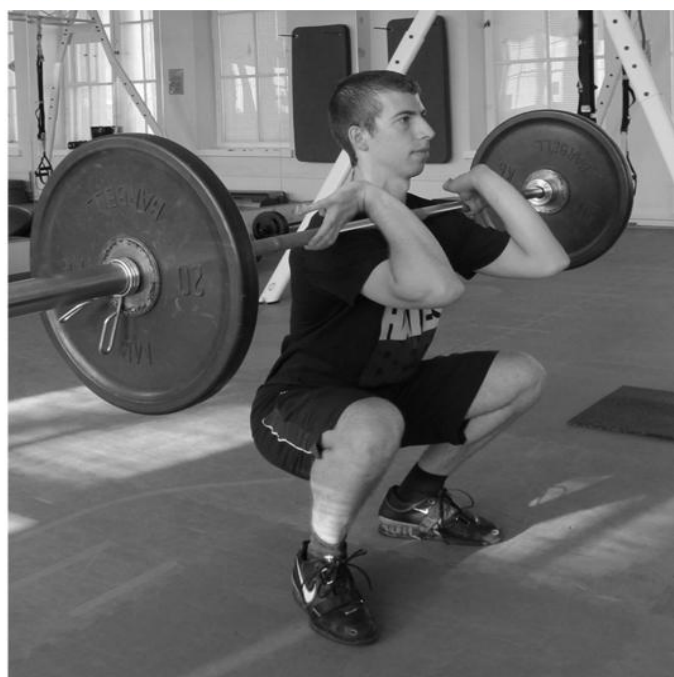
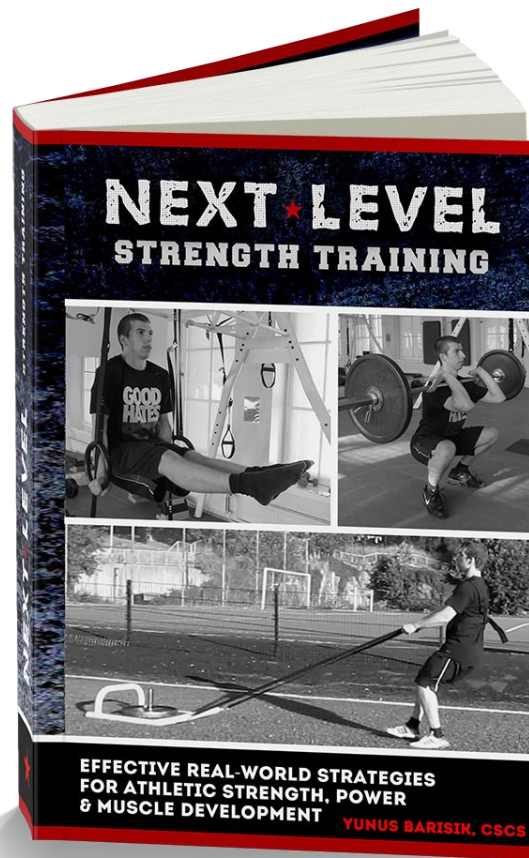


NEXT LEVEL STRENGTH TRAINING



**EFFECTIVE REAL-WORLD STRATEGIES
FOR ATHLETIC STRENGTH, POWER
& MUSCLE DEVELOPMENT**

YUNUS BARISIK, CSCS



NEXT LEVEL STRENGTH TRAINING

By Yunus Barisik

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DISCLAIMER

Before you embark on any physical fitness program, you must get your physician's or doctor's approval.

The recommendations presented in this book are not medical guidelines but are for informational purposes only, and intended for use by adults capable of understanding the content and capable of seeking medical advice from appropriately licensed professionals when necessary or appropriate.

All forms of exercise pose some inherent risks. The author advises readers to take full responsibility for their safety and know their limits. Before practicing the exercises in this book, be sure that your equipment is well-maintained, and do not take risks beyond your level of experience, aptitude, training and fitness. The exercises and instructions in this book are not intended as a substitute for any exercise routine or treatment that may have been prescribed by your physician.

Don't lift heavy weights if you are alone, inexperienced, injured, or fatigued. Always ask for instruction and assistance when lifting. **Don't perform any exercise without proper instruction.** If you are taking any medications, you must talk to your physician prior to starting any exercise program or performing any strength exercises, including the ones depicted in this publication.

If signs of light-headedness, dizziness, nausea or shortness of breath occur while exercising, stop the workout immediately and consult a physician.

You must have a complete physical examination if you are sedentary, if you have high cholesterol, high blood pressure, or diabetes, if you are overweight, or if you are over 30 years old.

This manual is intended for informational use only. Yunus Barisik will not assume any liability or be held responsible for any form of injury, personal loss or illness caused by the utilization of this information.

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INTRODUCTION



*“I know of no better example of functional training than a 600-pound deadlift.
Except a 700-pound deadlift.”*

—Mark Rippetoe

30 years ago guys got brutally strong with the most basic strength training equipment known to man.

A barbell, several hundred kilograms of plates, a set of dumbbells, advanced bodyweight movements and a few carefully selected machine exercises were staples in any properly set up, progressive training plan. At a time when nobody had ever heard of functional training, Bosu balls, CrossFit or some other training modality currently in vogue, people were getting bigger, stronger, faster and leaner with less over-complication and thinking than with all the information overload we're suffering from these days.

The formula for success was simple...

Lift.

Eat.

Sleep.

Repeat.

Somewhere along the way, however, we stopped following what works. Enticed by countless marketing messages promising instant gratification without breaking a sweat in search of a strong, athletic body, we fell prey to the false idea that success should be easy and effortless.

We were bombarded with gimmicks such as *8 Minute Abs*, *Vibration Belt*, *Shake Weight*, *Wii Fitness* and fad diets that promised you could eat anything you want without getting fat.

Anyone who wants you to believe this nonsense is going to get you into head-turning shape is either a genetic freak or a scam artist trying to sell you something.

Let's make something crystal clear right from the get-go.

Once you breathe your very first breath on this planet, you are guaranteed one thing... DEATH.

The rest?

The rest must be earned. How much you earn and achieve is entirely up to you...

It's a wonderful life, indeed.

Getting in shape is brutally hard work.

People want to hear that it's easy and won't take much time. Who would voluntarily want to bend over and pick up a mind-numbingly heavy weight off the floor? Or run sled sprints until they're red in the face, feeling as if their lungs are about to burst? And who wants to spend weeks, months, even years learning and perfecting all those difficult looking exercises like power cleans and handstand push-ups?

Ahh, forget it... way too hard. Much easier to jump on a treadmill and burn off some calories, right?

We have been brainwashed into thinking that it's possible to get significantly stronger, leaner and more explosive with very little effort and even less dedication.

Screw.

That.

Noise.

It's time to wake up.

It's time to get real.

It's time to go back to the roots of REAL strength training.

The quickest way to achieving an athletic body and performing like an athlete is by training like an athlete. Compound movements performed with adequate frequency is key and should build the foundation of your training.

Machine and isolation exercises can have their place, especially if hypertrophy is the main objective, but a beginner is best served sticking to the big, basic lifts and getting really strong on them with good form.

With this book, my aim is to take out all the over-analyzing and second-guessing on your part, so you can finally take your strength levels and physique to completely new levels.

Consider this book a resource you can refer back to for many years to come.

And remember this...

It ain't strength training unless you're getting stronger.

No guts. No glory.

Stay strong.

Yunus Barisik

PART I:

PULLING THE CURTAIN BACK

CHAPTER 1: WHY THIS BOOK WAS WRITTEN AND HOW TO GET THE MOST OUT OF IT



“This is your last chance. After this, there is no turning back.

You take the blue pill - the story ends, you wake up in your bed and believe whatever you want to believe.

You take the red pill - you stay in Wonderland, and I show you how deep the rabbit hole goes.

Remember, all I'm offering is the truth - nothing more.”

—Morpheus

I your goal is to become bigger, stronger, faster and more athletic in less time and with less over-complication and thinking, this book is for you.

Over the last two years, my good friend and colleague, Teemu Mäki, and I have spent many evenings sitting in crowded cafés and on the phone discussing physical training as it relates to the never-ending quest of getting in better shape, pondering about what it really takes to make someone stronger, faster, more explosive and improve their body composition, and countless hours chuckling, wondering, debating and shedding tears of agony over what is wrong with the mainstream fitness industry.

Simply put, I no longer could blissfully stand on the sidelines and watch on as an idle onlooker as people are being conned by our wonderful \$26 billion fitness industry, whose real knack lies in trimming the fat around the middle of your wallet.

My goal with this book is to cut through the maze of bullshit that the fitness gurus/master marketers keep perpetuating, expose some of the most blatant lies surrounding the fit biz, and present the reader with a tangible, effective plan to provide guidance on his way to gaining strength and revamping his body composition to a completely new level.

However, let me warn you: you won't find anything new in this book, but you will find much that is generally not applied. It is *not* filled with untested ideas, idle boasting or weird and aberrant examples unreplicable by average mortals. It is *not* a dick swinging contest or an exercise in hype. Therefore, it does *not* promise you washboard abs in eight minutes or gaining 30 pounds of muscle in 30 days. If you're looking for such fool's gold, you'll be heavily disappointed.

This is a book, a guide for guys who take strength training seriously. It's filled with actual, real-life guidelines strung together from a diverse array of information - ranging from scientific studies to practical procedures developed by some of the top strength & conditioning coaches on the planet - proving its principles and demonstrating its strategies.

Now that you know where I'm coming from, below are merely a few of the problems that exist in the fitness industry today:

- Fitness magazines are rarely anything more than glorified supplement ads. A typical "Gain 20 Pounds of Muscle in 6 Weeks" exercise program you find in these publications is haphazardly scraped together in the same vein as the writers of Spider-Man 3 wiped their asses on a keyboard and called what got printed out blockbuster action.

As Jamie Hale, popular fitness author/trainer, states:

“ If you have ever looked through a bodybuilding magazine, you will notice that supplement research ads fill more than half of the magazine. This creates a problem with the validity of

everything else in the magazine because authors are often instructed on what they can and can't write. I have experienced this a few times when writing for magazines.

When I first began writing for magazines, I was exposed to this type of scenario. The editor of a popular East Coast bodybuilding magazine told me that he knew that the majority of claims made by supplement companies were BS but I couldn't write anything negative about supplements because their support is what kept his magazine alive. 🗨️¹

The fitness publishing industry makes money off people who subscribe to their magazines. One does not require a Mensa membership to recognize that it lies in their best interest to keep recycling the same old useless drivel that ensures you are getting nowhere in your training. Whether it's a new gimmicky exercise machine, a ghost-written training program of a pro bodybuilder or a new study they found "that COMPLETELY changes the rules of muscle building!!", rest assured, you'd be better served skipping the magazines altogether, and investing that time into reading about how old time legends such as Arthur Saxon, George Hackenschmidt, Tommy Kono and other Iron Game pioneers trained.

Think about it... if they gave you the keys to making progress on your own, you'd eventually stop being dependent on their advice and cease buying the mags.

Instead, they give you a so-so program and on the next page convince you that the real reason behind the cover boy's jacked physique is a secret supplement. Never mind that the cover model was pimping some other supplement a while back, saying how he had to thank that for his ripped body before this new wonder product ever hit the shelves.

- Personal training is the only health profession in the world where people judge the service provider based on his looks, not his knowledge - at least initially. You could know as much about training and nutrition as Paris Hilton knows about making great music, but if you happen to have great genetics and look the part, people will gladly pay for your "expertise".

And I get it. You wouldn't take nutrition advice from a fat doctor without raising an eye brow, right?

But when we're talking about training and nutrition methods/guidelines/strategies/philosophies (or whatever you wanna call them), there has to be a scientific approach behind the whole damn thing.

Personal trainers and coaches love to spout complex words and abstract ideas in an effort to make them look really clever (and get people to buy their "cutting-edge" stuff). But how often are their recommendations based on clear, proven, verifiable scientific conclusions? What I'm saying is, while it's okay to disagree on pre-established notions and "think outside the box" when it comes to fitness, your theories need to be backed up by something much more encompassing than your ability to lift X amount of weight, having done a bodybuilding show or possessing a few arbitrary letters attached behind your name.

There has to be more weight behind your words than a simple "look at me!" Otherwise, you're simply appealing to authority, which, sadly, is what most "gurus" do when they're trying to convince the masses that their methods are the best. When you dig a little deeper though, you quickly realize they're all smoke and mirrors.

I'm a firm believer in evidence-based application of fitness information. Hopefully sometime in the not so very distant future, we'll begin to see a shift from the traditional way of basing training and nutrition recommendations on anecdotal opinion, hearsay and pseudoscience to reaching conclusions brought about by what the scientific literature tells us, as well as what trainers in the real world are doing to generate results with their clients.

This following quote by Bret Contreras summarizes my thoughts on the subject rather eloquently:

“ I've noticed an alarming trend in the online strength and conditioning industry as of late - I've been seeing more and more coaches dissing research. This is utterly reprehensible to me. Perhaps this mind-set has emerged on account of the hundreds of arm-chair experts who give researchers a bad name.

The way I see it, if you take any coach who has tons of "in the trenches" training experience, and you bring him up to speed with the research, it will make him even more effective at what he does. Any coach who doesn't realize this clearly hasn't spent time studying. Considering the surmounting science in the fields of Strength and Conditioning, Biomechanics, Physiology, and Physical Therapy, we're learning at a faster rate than ever before, and it's highly important to stay up-to-date.

Being “evidence-based” doesn’t mean to ignore your own experiences, anecdotes, or practical findings. It doesn’t mean you should hit the books and abandon your training and practice. It doesn’t mean you should be that fool who quotes some obscure study while dismissing the experiences and opinions of all the top athletes and professionals. Last, it most certainly doesn’t mean you should ever abandon common sense. To me, being “evidence-based” simply means that you’re the type who considers and weighs all of the available evidence and understands the quality and limitation of each piece of evidence.

An evidence-based practitioner is curious and open-minded, but skeptical. He questions everything. He values what the experts know, he learns the tradition, he understands the scientific theory, he attempts to study the entire body of knowledge before formulating an opinion or hypothesis, he experiments, and he values the scientific method. He realizes that all research has limitations, that all researchers have biases, and that some types of research are better than others. But he understands that controlled studies are superior to anecdotes, logical thinking, expert opinion, intuition, and trial and error. He knows that the more specific the study, the better, and that what he believes today will likely be much different each year as the field advances. 🗨️²

The best trainers in the industry blend their theoretical education and hands-on experiences into a training philosophy that can benefit anyone from elite athletes to weekend warriors to those of us who just want to throw some weights around and look great naked.

Another aspect I feel needs to be stressed is that knowing how to get yourself in great shape is alone no indicator of how good you are at teaching others. To draw an analogy from ice hockey - my favorite sport - some of the most accomplished coaches throughout the history of the game have been guys who never were elite players in the NHL. Many of them were mediocre to downright awful players, yet excelled as coaches because they became students of the game when they couldn't get by on just talent.

Scotty Bowman, Al Arbour, Mike Keenan and more recently, Mike Babcock, all lead their teams to winning the Stanley Cup without a glamorous pro career (in fact, out of the four coaches mentioned, only Arbour has any NHL games under his belt as a player). On the other hand, the greatest player of all time, Wayne Gretzky, had a mediocre stint as the head coach of the Phoenix Coyotes, failing to lead the team into the playoffs in all of his four years with the club.

So what does all this have got to do with fitness and personal training?

When you take into account that most personal trainers consider themselves "knowledgeable enough" in the field of exercise science after having completed their certification at a weekend course, which barely manages to scrape the surface of the vast amount of training related information out there, and that for many of them "continuing education" means getting their training advice from Men's Fitness, anyone this side of Stevie Wonder can see why consulting a run-of-the-mill personal trainer at a big box gym is about as useful as hiring a stripper for a six-year-old's birthday party.

Now, I'm far from perfect myself and still have a long way to go in this field, but I believe in working hard, taking the advice of people who have blazed the trail before you and studying your ass off. It's the only way to get anywhere in any endeavor. I was once told by someone I look up to that if you read only one book per month related to the topic you seek to master, it would amount to 12 books per year. After five years, you'd have obtained the knowledge and wisdom from 60 books and could be considered a national expert on the subject.

I love books and have no trouble hitting them hard. So I figured, what if I read or watched a book/DVD on training and nutrition *per week*? In the past year alone, that amounted to over 50 books/DVDs consumed. And that figure doesn't entail the countless training related articles and scientific journals I plow through on top of that. Right now my training library consists of well over 100 resources and I think it's time to buy a new book shelf because I'm running out of storage space.

And I don't mean that in a braggy, high-fiving, macho frat guy kind of way, just in a general, FYI, this-is-my-life kind of way... None of what I say in this book is about bragging or attempting to come across as someone who has got all the answers. I have no need for that or interest in doing so. Like I said, I still have a long way to go. Maybe after having read another 200 books I will actually know a little something about something... And if you wish to know exactly which resources I've studied, just drop me a quick e-mail at yunus@next-level-athletics.com, and I'll gladly send you a list.

By the way, I have included a short list of resources at the end of this book, so check it out once you get there.

I nearly shed a tear when I read this following quote by Olympic lifting coach Glenn Pendlay, because what he says is the real deal. It's also the stuff that you'll never hear the gurus with big egos utter.

“ If you really want to know how to get people stronger, train yourself like a madman, learn all you can from that, seek out people who know more than you do and learn from them. Learn all you can about track and field training and Olympic lifting and powerlifting.

Learn from the people in those sports that are actually producing athletes, and not the ones who are simply famous. Compete in those sports yourself even if you suck.

Bookmark Medline and read all the research you can. Develop an affinity for the local university library where you can photocopy the full articles you saw on Medline. Call foreign coaches and talk to them. Read all the books available on training.

Never assume that any one person has all the answers or get so carried away on one thing that you never learn or adapt your ideas again. Train or assist in the training of any athlete you can lay hands on, and then repeat each of the above steps consistently for somewhere between 10 and 20 years and you'll probably be there. 🍷³

But this book is not about me or what I'm trying to accomplish, so let's move forward...

- So if you can't trust the advice found in magazines or provided by a regular personal trainer, what's the next step to finding out the truth about how to lose fat, gain strength and appear more attractive? You turn to the Internet for help. I mean, what can you *not* find online these days?

- How to Make and Earn Money Online... In Singapore! (Only one \$47 payment required)

- Online Dating Success for Men! (\$37 e-book... even if you're butt-ugly, retardedly attractive females will fall into your lap with a few genius keyboard strokes without ever having to leave the house... yeah right)

- Miracle Weight Loss Plant Garcinia Cambogia Extract - The Fastest FAT Buster, Holy Grail of Weight Loss! (Increases weight loss by 2 to 3 times what people naturally lose with just exercise and diet alone... *puh-leeeez*)

All of those ads I was able to find through Google in less than 5 minutes. Bear in mind this is merely a small sample of what's out there. In the online world, scam-hogs never get tired of selling you the next magic pill.

- As an addendum to the previous point, not *everything* on the Internet is entirely worthless. Some of it - though clearly a minority - is legit.

What doesn't help though, is that there's typically a vast affiliate network behind every successful fitness info product you're gonna run into. People trying to sell you something will try to discredit every system that isn't theirs and every trainer/nutritionist that they aren't getting a (monetary) kickback from. It gets confusing and you don't know whom to trust.

I was quite sickened to find out how a certain female trainer got her breakthrough in the business. She had basically just gotten certified (which, as we established previously, is no guarantee of anything), had trained virtually nobody in her life yet with the backing up of enough well-known names in the industry launched her first information product that generated a lot of money. I'm not gonna throw out any names but if you've seen any of the more popular e-books/training guides aimed at females online, you'll know who the person I'm referring to is.

To be clear, I have nothing against people making money online. If your stuff is good, people get results by following your methods and you provide more value to your followers than the next person, then by all means get your product into the hands of as many people as possible. But when people engage in pimping other people's products with the goal of making a quick buck in mind, it's a slippery slope, my friend.

Another thing I've noticed is that in order to keep selling stuff, trainers and "experts" have to keep making things more complicated as time goes by. You will never hear a trainer/expert/guru say: "Listen, buddy... I said it all 5 years ago, nothing more to say, sorry... However, you know I need to sell something, so now I'm all about nutrient timing/essential fatty acids/more protein/less protein/macronutrient combining/macronutrient separation/more HIIT/less HIIT/no cardio/some

cardio/strictly Tabatas/10 minute workouts/ 4 minute workouts/superfoods/fasting 24 hours/fasting 16 hours/fasting 8 hours/yoga/paleo/cheat meals."

To mess it up even more, most people see good results when they start something, no matter what it is. If you've never trained or kept a closer eye on your diet before, and start doing "something" (as long as it somehow is in line with what you want to achieve) consistently, it has an effect, and you will make progress. What is funny though with this is that people often fail to understand that many approaches can lead to the same end result. Thus, they simply become close-minded, believing their approach to be the "one true way", and try to defend their position with diehard fanaticism resembling religious zealotry.

This is a funny, funny business indeed.

Now that I have basically called out everybody in the fitness industry from lazy personal trainers to magazine publishers to snake oil (supplement) salesmen, I realize that my chances of one day writing for a mainstream fitness publication are about as high as the combined IQ score of the Kardashian family.

But I feel it's my duty to take what I have learned from all the good guys in the industry - the Cresseys, Ferruggias, Wendlers, Gentilcores, Berkhans and other respectable fitness pros - and try to spread the truth to those who are willing to listen with an open mind. If I can expose the Matrix the majority of us are blissfully living in, and help even one single person break free and reach their training, strength, fitness, physique goals by reading this book, I consider my mission accomplished.

I'll be the first one to admit that there are a lot of things I don't know. But it doesn't matter because I learn something new and valuable every day, and intend to be a life-long student of strength training, nutrition and everything related to it until the day I die.

It's also one of the reasons I decided to get organized, tackle the research out there and eventually put my findings to paper - so that I'd be able to strengthen my own knowledge base. To quote strength & conditioning professional Mike Robertson:

“ When you learn something, you need to pass it on. Coach somebody, write an article or blog, I don't care. But once you think you understand something you need to pass that information on to others.

Just because you “think” you know something doesn't mean jack - when you can teach someone else that same concept and help them understand it, then you're starting to wrap your head around things. ”⁴

Which brings us to the next question...

How will reading this book be beneficial for you?

While discussing ATP production, high threshold muscle units or rate coding of slow-twitch muscle fibers certainly is an interesting pastime for a geeky guy like myself, I wanted to make things simple for YOU, the reader. That's why you'll notice the conversational tone throughout this book and lack of fancy, Greek-sounding words that nobody can pronounce and whose real meaning you need to Google every 30 seconds.

We'll let pompous academicians engage in mundane gibberish and worry about impressing people around them with their superior knowledge of all things fitness and the letters attached behind their names. You will find none of that shit here.

Still, in the world of fitness where pseudoscience runs rampant, I've found it necessary to back up my opinions with a healthy amount of valid research. This way you can be sure that I'm not simply coming up with stuff that has no basis in real life. If you don't agree with something I'm saying, you can easily check up on the facts by yourself.

Don't worry though, strange expressions and confusing scientific language will not abound in this book. As always, I have tried to keep things simple and easy to understand from beginning till end. No confusing formulas, technical jargon or scientific theories shrouded in mystery; just the real deal of what works and why. Just imagine two normal dudes - you and me - having a conversation over a few drinks and keepin' things very real.

In **Part I**, I delve deeper into the lies surrounding the fitness industry, and the many shady ways fitness is packaged and sold.

I doubt you've ever heard the fitness industry being discussed so openly.

Some of the information in this manual will excite and enlighten you.

Some of it will shock you.

Some of it will make you downright angry.

But all of it is true.

I promised you I was gonna keep it real and I ain't backing down from that promise.

Part II serves as an introduction to proper strength training and is designed to provide you with science-based answers on how to train for optimal strength and body composition gains from the point of view of someone who has not very much experience training with free weights (< 1 year).

Even if you've been going to the gym for a long time, I can pretty much guarantee that you'll pick up something valuable to add into your own training by reading this chapter.

Part III could be regarded as the real meat and potatoes of this book since it presents you with proven strength training programs that I use with clients. We will have laid a solid foundation of strength training knowledge in all the previous chapters leading up to this last one.

But as someone significantly smarter than me once said, "knowledge without ACTION is worthless". I've got you covered on that. With these training plans you're ready to finally start making some big time progress in the gym.

The appendix concludes the book with a short list of training resources I recommend.

Before we proceed to the really good stuff, I have one last question for you...

Red pill or blue pill?

Alright my friend, let's kick back in my virtual jacuzzi, down a tray of vodka & cola shots while chatting about some of the most important aspects in strength training, shall we?

Drinks are on me.

CHAPTER 2: TELL ME LIES, TELL ME SWEET LITTLE LIES

The sport supplement industry throughout the world has exploded, with more than 600 sport nutrition companies marketing over 4000 products that produce annual sales of more than US\$4 billion in the United States alone. To enhance their marketing potential and compete for sales, many of these companies make unsubstantiated claims concerning the efficacy of their products. At times, unscrupulous companies have knowingly laced their products with banned substances to enhance their effects.⁵

If a product is not classified as a drug or advertised as having therapeutic value, FDA (The U.S. Food and Drug Administration) regulations concerning its sale are relatively relaxed. This means that **any manufacturer can introduce a new dietary supplement to the market without special approval** and that the FDA will not investigate its safety or effectiveness unless a health risk is brought to the agency's attention.⁶

Essentially, a supplement company may manufacture whatever nutritionally deficient junk they please without experiencing fear of having their stuff pulled off store shelves *unless* suspicion arises that the product directly causes illness or death, thus attracting the interest of the FDA.

Hence, you could create your own cleverly named supplement product, fill the capsules with cacao powder and white flour, pixie-dust the hell outta it (Google the term if you don't know what that means), hire a professional fitness model or athlete who has never used the product swear how it helped him put on 20 pounds of rock-solid muscle in 6 weeks (in return for a hefty remuneration, of course), and nobody will hold you accountable for the fraud you've committed. Such is the crazy world we live in.

Which brings us to the next point - fitness marketing and the Art of Deception.

Ain't Nuthin' But a \$ Thang

In *Bigger, Stronger, Faster*, Chris Bell's fantastic documentary on steroid use in America, we get to observe first-hand how effortless it is to alter reality with a little help from savvy lighting, posing and picture manipulation, taking someone from fat to jacked in a matter of minutes.

Here's a little Photoshop magic for you, courtesy of filmmaker Chris Bell.



Chris Bell's amazing 60 minute Photoshop transformation

Place the before/afters next to a random supplement promising huge gains, add in effective sales copy and - *voilà!* The masses are eager to open their wallets to get their hands on this miracle supplement that supposedly gives you steroid-like gains. Pfui.

I hope this dose of real-world reality doesn't burst your bubble, but it's a fact that marketers stretch the truth (to put it mildly), when it is to their advantage. What you see is seldom what you get in the health & fitness industry. I know it certainly was a huge eye-opener for me when I found out the truth about fitness marketing.

For the longest time I was under the assumption that there HAD TO be someone, some high government agency or department that would stand tall as a silent guardian, a watchful protector of ethical conduct, chastising those who tried maliciously to take advantage of others, ensuring that we, the general public, were not being conned by false marketing claims.

Forget it.

In this ruthless jungle of dirty dealings, where greedy hyenas are praying upon you, you're left to fend for yourself all by your lonesome, and the only weapons in your arsenal are knowledge and a healthy sense of skepticism. You know, "if it sounds too good to be true, it probably ain't..." and all that jazz.

To showcase how deep the rabbit hole runs, I've included this following direct excerpt from fitness photographer Rick Schaff's terrific book, *Misled*, that exposes many absurd lies and provides a compelling insider look on what's really going on in the fitness business.

“Over the years, many of my photos have ended up in national ad campaigns promoting different products and companies. On several occasions, I have been shocked by the dishonest claims made by certain companies when using my images. The following headline is an example of one:

“Bodybuilding Champion Joe Shmoe uses X-Powder to be number one!”

Then the quote from Joe Shmoe will typically appear as something like the following:

“I have never made such gains in muscle mass until I started using X-Powder. I put on 15 lbs. of rock hard muscle and blew my competitors away. This product really works.”

-- Joe Shmoe

The problem with the image used to illustrate Joe Shmoe's amazing accomplishments is the fact that it was taken years before the product was even created. Furthermore, the main reasons Joe Shmoe is muscular and lean is because he has been religiously training, eating right for ten years, and is on the gas (steroids).

It is estimated by many professionals in the fitness industries that an alarming amount of national-level and professional-level competitive bodybuilders, fitness models and athletes take or have taken anabolic steroids, androgenic steroids, and/or growth hormones in order to increase muscle size and burn fat.

Please understand that it is not my intention to criticize or condone anyone's option to use steroids or other enhancing products for sound medical reasons under the supervision of a physician. What I am criticizing here is the deceptive techniques many supplement companies, equipment manufacturing companies, and diet promotion companies use in order to mislead the consumer by suggesting that the remarkable gains of their spokes-models are directly attributed to the sole use of the products they are selling.

It is additionally disturbing that, in general, their tests are not usually conducted in controlled settings employing the standard scientific practice of double blind testing. Without such controlled testing, the performance claims made by many of these companies are highly suspect, at best.

I simply want you to know that most of the athletes endorsing these popular protein powders, fat burners, diet products and equipment companies can attribute their extreme gains to tough training schedules, strict diets, and performance enhancing drugs, not the numerous products they proclaim to use in the advertisements in which they appear. 🙄⁷

If you thought that was all, deceit and hypocrisy run even deeper in the fit biz.

You see, most fitness magazines are owned by supplement companies. Consequently, hidden agendas are everywhere in this industry. For instance, what appears to be a non-biased review of a supplement in this month's issue of Muscle & Fitness Magazine, is actually a shameless plug in disguise.

Here are a few examples of the fitness magazine/supplement company connection:

- Muscle & Fitness -> Weider products
- Flex -> Weider products
- Muscle Mag -> MuscleTech products
- Muscular Development -> Twinlab products
- T-Mag/T-Nation -> BioTest products

Additionally, even when not directly promoting a supplement of their own, fitness magazines are full of pseudoscience comprising of puzzling theories and incessant dogma rather than cold, hard facts, as this following quote by nutrition author Brad Pilon illustrates:

“ Part of my job [as a research analyst at one of the world’s leading supplement companies] was to review bodybuilding and fitness magazines. Every month I would have to read through the top ten magazines on the market. I was constantly reading about the ‘latest and greatest’ diet methods. After years of reading magazine after magazine, I didn’t know what to believe anymore. Each month, it seemed like the newest diet methods contradicted the diet methods that were in last month’s magazines. I started to think that the weight loss industry was full of nothing but confusing and constantly recycled misinformation.

When it came to the science of losing weight, every so-called ‘nutrition guru’ and weight-loss personality had his or her own theories on what did and didn’t work. After years of reading and evaluating all of these nutrition and diet programs, I was actually starting to ignore my previous doubts and get consumed by the hype!

Despite all of my formal education in the nutrition field, even the most absurd diet theories eventually started to sound logical to me, even though I had never come across any research that could convince me that these theories were supported by strong scientific evidence.

In reality, the vast majority of what I had read in these magazines was just theories and speculation. Some of them were based on science while others were complete gibberish. Many were contradictory to one another, and others even defied the fundamental laws of thermodynamics and science.

Month after month, dozens of magazines would appear on my desk, and month after month, I would see new and old diet ideas being trumpeted as the newest, most effective way to ‘blowtorch through stubborn body fat’.

At this point, I noticed a funny thing about the industry - if an idea is published enough times, and if enough people accept it, it becomes true, no matter how inaccurate it really was.

Whoever said, “you can say the same lie a thousand times but it doesn’t get any more true,” has obviously never been involved in the nutrition industry! 🍷⁸

As usual, when money is to be gained, greed takes over. You’ll be hard-pressed to find another industry that cashes in on people’s anxieties about their body image with greater glee than the fitness business.

I doubt even James Ellroy could create such dense plotting, shameless immorality and a tightly knit web of lies in one of his novels than what we can witness taking place right in front of our eyes in the “fitness & health” industry.

And as long as people choose to fall for this claptrap that a pill in a bottle will somehow solve their weight, body composition or self-esteem problems, we will witness shady marketers keep on greasing the suckers and goosing the gullible for vast profits as they’re laughing all the way to the bank.

CHAPTER 3:

SOMEBODY PUT SOMETHING IN MY PROTEIN SHAKE

Drugs, anabolics, 'roids, juice, gym candy, gear... Performance-enhancing drugs have become increasingly popular in professional sports all across the board ever since they were first invented during the first part of the 20th century. Of greater concern, however, is that they're more and more being used by impatient recreational trainees, who are not willing to put in thousands upon thousands of hours fine-tuning their lifting and nutrition in the gym and at the dinner table, and opt to look for quick fixes instead.

Now, I'm not gonna tell anybody how to live their life. My morals are not your morals, and the only person whose actions you're directly responsible for is you.

Having said that, whenever a famous athlete is being tested positive for performance-enhancing drugs, the ensuing media outcry makes for some priceless B-grade entertainment. Not to mention the bizarre cover-up stories that follow when a busted athlete attempts to come up with a viable excuse for getting caught.⁹

As one former German long-distance runner and Olympic gold medalist claimed, his positive drug test result showing extremely high levels of nandrolone (an anabolic steroid) was due to somebody having spiked his toothpaste with the drug.

Or the time when an MLB player went to great lengths to set up a fake website for a fake supplement, then claiming that he only used that product and had no idea it contained steroids in order to dodge being suspended by the league. (According to Major League Baseball's official drug policy, if a player can prove that they ingested a banned substance unintentionally and through no fault of their own, they won't face a penalty.)¹⁰

Are these guys for real?!

The second-hand embarrassment I experience when reading this stuff is enough to make me want to dig a hole and jump in it.

It should come as no surprise that anabolic-androgenic steroids (AAS) have been shown time and again to increase lean body mass and enhancing athletic performance, especially via notable strength gains.¹¹

Nevertheless, a much more interesting topic and the one the media never manages to discuss is...

Just how big of an effect do anabolic-androgenic steroids really have on strength levels and muscle size?

Let's take a look at a classic study conducted by Bhasin and colleagues in 1996, where the goal was to determine whether supraphysiologic doses (doses that are larger or more potent than would occur naturally) of testosterone, administered alone or in conjunction with a standardized program of strength-training exercise, increase fat-free mass, muscle size and strength in normal men.¹²

In the study, the original 50 male participants received either 600 mg of testosterone enanthate in sesame oil or placebo intramuscularly (through an injection) each week for 10 weeks. The subjects were then further divided into four groups according to this setup:

Group 1: Placebo + no training

Group 2: Testosterone + no training

Group 3: Placebo + training

Group 4: Testosterone + training

Participants in Groups 3 & 4 trained at a high intensity (70-90% of their 1RM for 4 sets of 6 reps) on three nonconsecutive days each week over a 10 week treatment period.

Out of the 50 recruited participants, 40 completed the study. Here's what happened during the 10 week training cycle...

TABLE 4. BODY WEIGHT, FAT-FREE MASS, AND MUSCLE SIZE AND STRENGTH BEFORE AND AFTER THE 10 WEEKS OF TREATMENT.*

VARIABLE	NO EXERCISE		EXERCISE	
	PLACEBO	TESTOSTERONE	PLACEBO	TESTOSTERONE
Body weight (kg)				
Base line	79.5±4.3	82.2±1.9	85.5±3.3	76.0±3.0
10 wk	80.8±4.4	85.7±1.5	86.4±2.9	82.0±2.8†
P value	—	0.004	—	<0.001
Fat-free mass (kg)				
Base line	65.1±2.5	69.9±1.3	72.1±2.3	65.3±1.8
10 wk	65.9±2.7	73.1±2.2	74.1±2.2	71.4±1.8†
P value	—	—	0.017	<0.001
Triceps area (mm ²)				
Base line	3621±213	3579±260	4,052±262	3483±217
10 wk	3539±226	4003±229§	4,109±230	3984±239§
P value	—	0.003	—	<0.001
Quadriceps area (mm ²)				
Base line	8796±561	9067±398	9,920±569	8550±353
10 wk	8665±481	9674±472§	10,454±474§	9724±348¶
P value	—	<0.001	—	<0.001
Bench-press exercise (kg lifted)				
Base line	88±5	96±8	109±12	97±6
10 wk	88±5	105±8§	119±11§	119±6†
P value	—	—	0.005	<0.001
Squatting exercise (kg lifted)				
Base line	102±6	103±8	126±13	102±5
10 wk	105±6	116±5	151±13§	140±5¶
P value	—	0.004	<0.001	<0.001

*P values are shown for the comparison of the 10-week values with the base-line values when $P \leq 0.05$. Plus-minus values are means \pm SE.

† $P < 0.05$ for the comparison of the change from base line with that in either placebo group.

‡ $P < 0.05$ for the comparison of the change from base line with that in either no-exercise group.

§ $P < 0.05$ for the comparison of the change from base line with that in the group assigned to placebo with no exercise.

¶ $P < 0.05$ for the comparison of the change from base line with that in the other three groups.

Figure 1. Body weight, fat-free mass, and muscle size and strength before and after the 10 weeks of treatment.

Group 1 (placebo + no training) saw an average of 1,3 kg of body weight gained, out of which 0,8 kg was fat-free mass. Strength gains were virtually non-existent, and the cross-sectional area (CSA) of triceps and quadriceps actually decreased, which is not all that surprising given that they did not perform strength training for 10 weeks.

Group 2 (testosterone + no training) gained a significant amount of muscle with minimal fat with an average gain of 3,5 kg of body weight and 3,2 kg of fat-free mass. Strength gains in the squat and bench press were 13 kg and 9 kg, respectively.

With **Group 3 (placebo + training)** is where things get really interesting. Squats increased by 25 kg and bench press by 10 kg. However, weight increased only by 0,9 kg, which was a consequence of 2 kg fat-free mass gained and 1,1 kg fat lost.

So, even though they DID NOT TOUCH A WEIGHT FOR 10 WEEKS, subjects who received exogenous testosterone (Group 2) outgained those participants who did lift weights but received no extracurricular assistance (Group 3) in terms of muscle mass and size (CSA increases). That's some powerful chemistry right there.

Unsurprisingly, **Group 4 (testosterone + training)** witnessed the greatest boost both in strength and size. Body weight went up by 6 kg, out of which 6,1 kg was muscle gained and 0,1 kg fat lost. Squats shot up by 38 kg and bench by 22 kg.

What these results tell us is that you could literally sit on your ass for ten weeks and gain more muscle than someone who used that time to bust ass in the gym, given that you had a great drug provider.

Likewise, comparing yourself and your results to those people who train but are on the juice is a futile attempt at best. Getting bigger and stronger, for the less genetically blessed, is an agonizingly slow process and there are no shortcuts, except for anabolics.

Below is a more visually attractive summary of the results obtained in the Bhasin et al. study cited above.

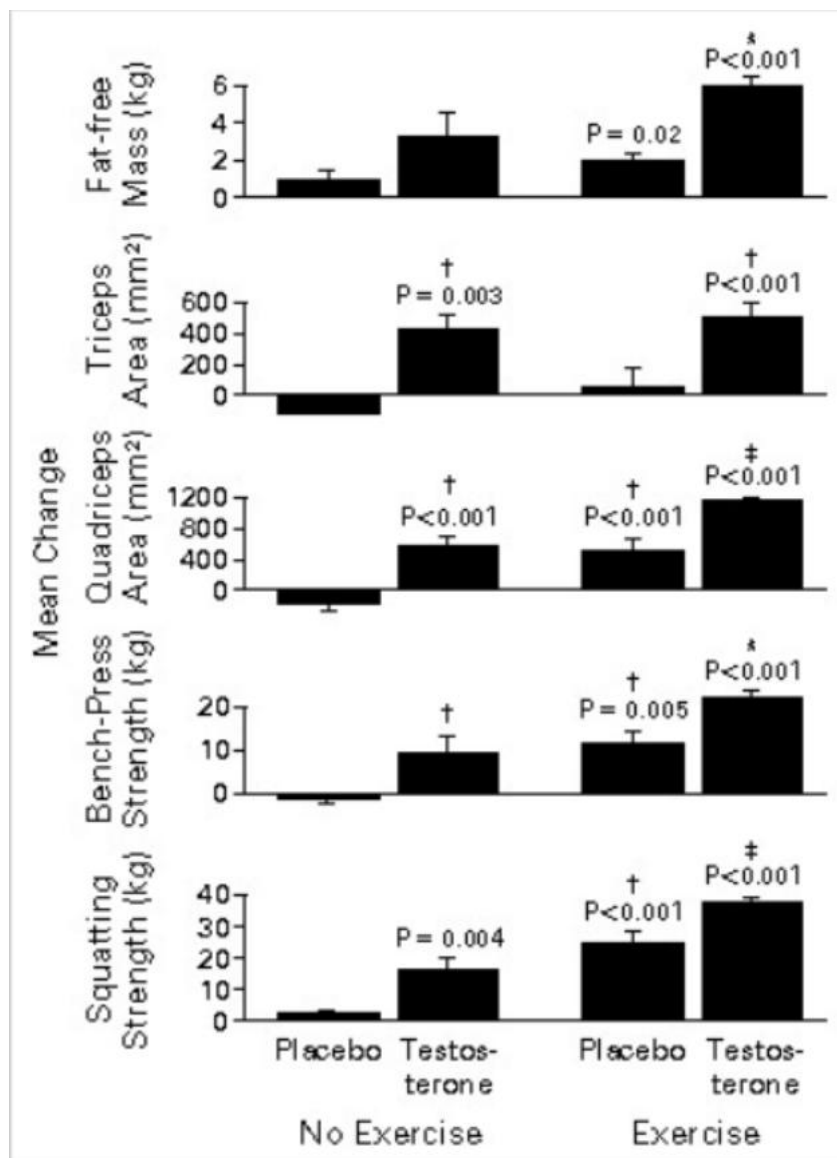


Figure 2. Changes from base line in mean (\pm SE) fat-free mass, triceps and quadriceps cross-sectional areas, and muscle strength in the bench press and squatting exercises over the 10 weeks of treatment.

What is interesting to note, as well, is that Forbes discovered that there exists a logarithmic relationship between the total dose of anabolic steroids and increases in lean body mass.¹³ Basically, small dosages elicit only a small hypertrophic response. The greater the dosage, the more pronounced is the increase in both lean body mass and strength levels.¹⁴

Any Side Effects That I Should Be Aware Of?

For the sake of completeness, it should be pointed out that in addition to their obvious strength and muscle enhancing attributes, AAS also come with a fair share of risks and adverse effects.

Again, my intention is not to tell anybody what they should be doing or passing moral judgment on their actions. I'm merely laying out physiological facts so you can make intelligent decisions based on sound knowledge, not on unsubstantiated information and make-believe thinking.

In males, the most frequently reported side effects include increased or decreased libido, aggressiveness, muscle spasms and gynecomastia (breast development in males). Users of AAS frequently may experience testicular atrophy and decreased sperm production. Cases of male-pattern baldness and exacerbated acne have also been reported.^{15,16}

Moreover, liver function disturbances and diseases - such as tumors and hepatitis - have been attributed to orally administered doses of AAS.^{11,15}

In females, continued steroid use has been shown to cause a general masculinization response, including the development of a male physique, increased body hair, failure to ovulate (menstrual irregularities) and deepening of the voice.¹⁷

How Prevalent Is Steroid Usage Anyway?

Now that we have quantified the effects of anabolic steroids on humans, let's take a look at how widespread the utilization of these substances is.

Yesalis and colleagues discovered a 55% rate of anabolic-androgenic use in powerlifters at a national level.¹⁸ Based on the findings of a study by Wagman and others, 66% of elite level U.S. powerlifters admitted to using AAS at the World Championships between 1986 and 1991.¹⁹

Tricker et al. reported that 54% of male bodybuilders at a regional competition were AAS users.²⁰ Hackett and others reported that 76% of male bodybuilders at the amateur level use AAS.²¹

So, a bunch of competitive strength athletes and bodybuilders are using performance-enhancing drugs. Hardly anything new there.

Worth noting, however, is that Kersey found that 15% of trainees in the regular health club/gym environment have used or are currently using AAS.²² Other studies estimate this figure to be much higher, ranging from 38% all the way up to 90%.^{23,24,25}

For many people, the news that steroid usage is much more widespread than they believe comes as a surprise because most people associate this rampant practice with pro sports. But when we look at the facts, it becomes evident that recreational usage of AAS is a common convention among the regular Joes looking to get buff, and definitely not reserved only for the higher levels of athletic competition where they are utilized in the hopes of enhancing athletic performance.

... And Should I Even Care?

The practical ramifications this information presents to us is that the guy with the perfect physique on a magazine cover, some athlete you saw hoisting huge weights on Youtube or the jacked guy you ask for advice at the gym who are enjoying the clearly favorable assistance of anabolic drugs may not really know that much about designing effective training programs for the non-assisted folk.

Consequently, many times what allows these individuals to successfully get away with in their workouts - splitting the body in parts and training them with low frequency, training with excessive volume performing 27 sets per body part per workout, workouts lasting two hours or more - will simply produce less than optimal results for others.

As such, you should not take every piece of information you read in a fitness magazine or online, or hear around the locker room as the Almighty Rules of Strength Training. Instead, I encourage you to dig up the facts on your own, separating the verifiable truth from gymlore, which is exactly what we'll be doing in Part II.

CHAPTER 4: REALITY CHECK, PLEASE

Much like what magazines such as Cosmopolitan have been doing to females for the longest time, raising anxiety about their body and sexual prowess by displaying heavily airbrushed celebrities on the cover as the measuring stick of how a woman is "supposed to" look, fitness and bodybuilding publications are doing the same thing to men.

What they fail to tell you is that those cover models don't look like that around the clock 365 days of the year. And how could they, when you take into account all the little things that go into setting up a successful photo shoot?

First, the model goes on a special diet and training program prior to the shoot, which often includes manipulation of carbohydrate, water and sodium levels in the body.

Second, various measures are taken at the set to ensure that the model's body appears more appealing to the eye of the viewer. Physique enhancement is all about illusion, so why not use every trick in the book? Body hair is removed, a fake tan and/or baby oil is applied on the model's body, and the lighting at the shoot is (of course) arranged so that the model's body can be portrayed in the most visually attractive way possible. A professional cameraman who knows how to work the angles can put the finishing "WOW" effect on an already impressive physique.

Finally, before the pictures taken at the shoot go to print, they are photoshopped for 110% perfection. Nasty scars, pimples and blemishes are digitally removed, already muscular physiques are inflated out of proportion with a few clicks of the mouse and behold! We're looking at The Perfect Man.

So when Larry Lifter goes to pick up a copy of Men's Fitness at the magazine stand, marveling at the incredible physique of the cover model, what he fails to realize is that he's looking at a carefully constructed illusion, not unlike one that a master magician would use in tricking his audience when performing on stage.

Male Image - What Is Realistic?

This may surprise you but weight training is not exactly a recent phenomenon.

The origins of strength training can be traced from Greek strongmen (the most popular being Milo of Croton) all the way back to ancient Egyptians some 5000 years ago²⁶, but for our purposes we'll narrow the historical point of view down to the past 100 or so years.



In the late 19th and early 20th century, professional strongmen toured through Europe and North America, entertaining large crowds in the biggest cities of the world. Their feats of strength, muscular development and showmanship drove them to great fame. Ordinary men wanted to be like them, women wanted to be with them.

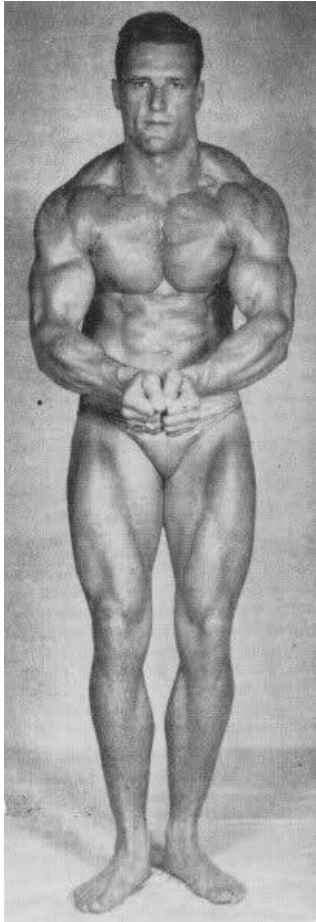
Popular names from that era include men like Arthur Saxon, Louis Cyr, Eugen Sandow, Maxick and George Hackenschmidt.



Eugen Sandow

Later on, around the 1940's and 1950's, when bodybuilding became more mainstream but before anabolic steroids hit the scene, guys like Steve Reeves, Clarence Ross, Reg Park and John Grimek portrayed the pinnacle of human muscularity.

For curiosity's sake, let's compare how two top bodybuilders of their respective eras looked. Below on the left is Clarence Ross (AAU Mr. America 1945, Mr. USA 1949) and on the right Mr. Olympia 2012, Phil Heath.



In essence, we can take one of the most accomplished bodybuilders in the world in the 1940's, have Doc Brown put him inside a plutonium-powered DeLorean time machine, travel 70 years into the future, and deduce that the guy looks like never having set foot inside a gym when we put him next to a modern day professional bodybuilder weighing in at 250 pounds, shredded to the bone, on stage. You can't explain away that big of a discrepancy with improved scientific breakthroughs that have assisted in creating more effective training programs and methods, or better supplements during the past few decades.

In fact, according to Casey Butt, who analyzed the anthropometric measurements of some 300 advanced bodybuilders and muscularly large strength athletes (including many drug-free class winning and overall title winning athletes) from 1947 to 2007, there are no apparent significant differences in the absolute levels of lean body mass between top bodybuilders from the pre-drug era of the 1940's and the top drug-free competitors of today, although the elite competitors nowadays carry lower levels of body fat on stage.²⁷

The problem these days is that most guy's idea of what "big" or "lean" means on a man of average height and frame is completely skewed.

To give you an understanding of how far off people's expectations are from reality, natural bodybuilding champion Dave Goodin clocks in at 5'7" (170 cm) and 170 pounds (77 kg) in contest shape, and it took him 20 years of dedicated training to put on 30 pounds (~14 kg) of muscle.^{28,29}

Arthur Saxon, who was considered one of the strongest and physically most well-developed males in the early 20th century, weighed 200 pounds (91 kg) at 5'10" (1.78 m), and had biceps that were slightly over 17" in circumference. At his best, he was able to hoist 371 pounds overhead with only one hand and clean & jerked 342 pounds.³⁰

Arnold Schwarzenegger possessed arguably one of the greatest male physiques of all time, yet according to him he weighed about 235 pounds (107 kg) at 9% body fat in contest shape at 6'1" (185 cm).

Yet you've got regular dudes claiming to be a lean 220 pounds or to walk around "at about 5-6% body fat" just like that, which is quite a remarkable feat taking into account that 3-5% body fat is considered essential for life in males^{31,32}, and approximately the range most steroid-using bodybuilders reach at their very leanest condition after weeks of dieting for a show. According to Casey Butt's research, most elite drug-free bodybuilders compete at slightly higher body fat levels, typically between 6.8% and 9.9%. Moreover, routine claims by bodybuilders of body fat percentages under 4%, although not impossible, should be viewed with skepticism.

In light of all this evidence, we still have got guys on internet forums claiming to be 230 pounds at 2.5% body fat ALL NATURAL.

Riiightt...

CHAPTER 5: GOING BACK TO THE ROOTS OF PHYSICAL CULTURE



“It is a well-known fact that the majority of men today are relatively weak.”

—George Hackenschmidt, *The Way to Live*, 1908

Not very many people know this but back in the day nobody was doing body part splits. If you study the strongest individuals throughout history, you’ll notice that it was always either full body or upper/lower training.

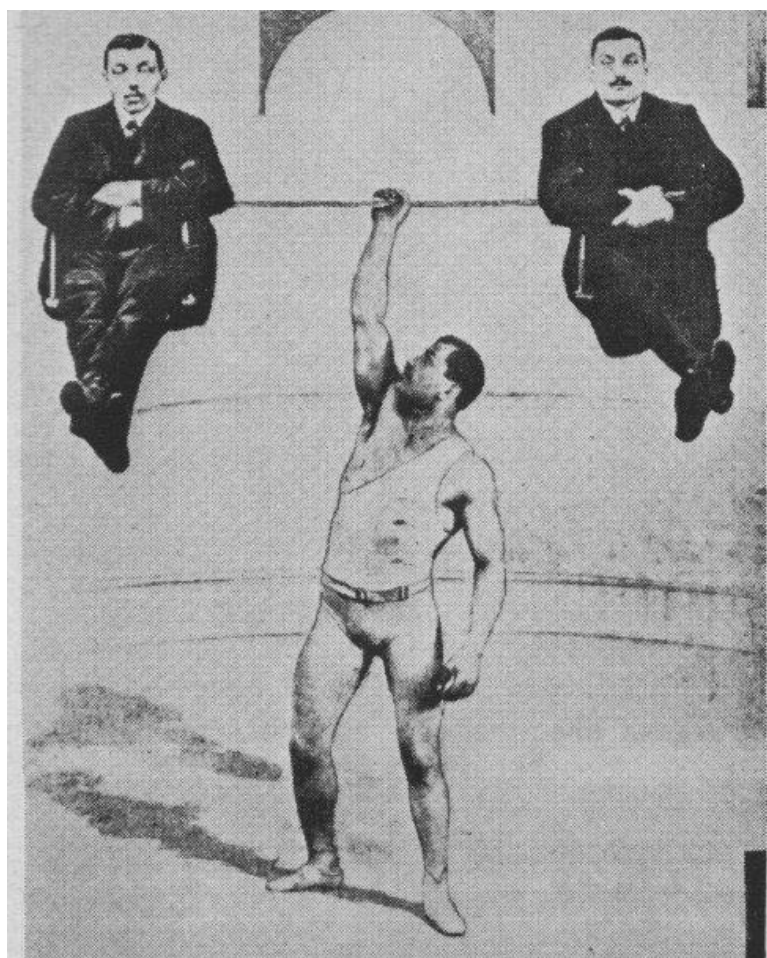
A century ago, every established strongman starting with Saxon, Hackenschmidt or Görner practiced a handful of barbell lifts with a high frequency, almost every day. These guys were rock stars at the turn of the 20th century, amassing huge crowds of spectators when performing their feats of strength live. They also taught their methods to hundreds, even thousands of men and women who were able to transform their bodies for the better and lead healthier lives in general.

Why am I belaboring the point and telling about the training methods of old-time geezers, whom you’ve probably never heard of before?

I believe it’s worthy of mentioning that some of the most bizarre feats of strength the human race has ever witnessed were performed way before our time, in the first half of the 20th century. So whatever the old school lifters were doing, it obviously worked.

Below are a few examples of lifts that have never been duplicated by the modern man even with all the advancements in medicine, nutrition and sports science.

- Hermann Görner pulled a one-handed deadlift of 727 lbs (330 kg) in 1920.
- Charles Rigoulot performed a 1 arm snatch of 261 lb (118 kg) at a bodyweight of 181 lbs (82 kg).
- Arthur Saxon possessed inhuman strength, examples of which include a world record 371 lbs (168 kg) bent press and pressing two grown men overhead with one arm as depicted in the picture below.



So how come these guys developed into brutal beasts the likes of which this world hasn't seen ever since?

I bet it had a ton to do with how old-timers just viewed lifting heavy weights around for 52 weeks every year as a passion, as a manifestation of their inner being in the physical world, knowing they were in this for the long haul while being able to banish all promises of a magic pill

so excessively ingrained in our current MTV/ADD generation and growing to love the journey, thus getting freakishly proficient at their trade.

In the pre-Internet era people understood the concept of putting in hard labor in exchange for consistent gains over an extended period of time.

These days you can't find a guy willing to stick to a program for longer than 6 weeks before he goes on an Internet message board seeking a new, better, gimme-my-gains-quicker program or quitting altogether because "it's just too hard".

Without willpower and consistency there can be no greatness. Only mediocrity can thrive under said circumstances. And believe me when I say that mediocrity is slowly but painstakingly taking charge in this world where people settle for less and less each and every day. It's a disgrace how every passing generation gets weaker and suckier in general even with all the technological "advancements" thrust upon us which are supposed to make our lives a helluva lot easier than a century ago.

Nowadays the heritage of the early days of Physical Culture has long been buried six feet under.

Anywhere you look, people are unnecessarily complicating this whole fitness thing. We're consuming 43 different brands of supplements, buying expensive but worthless gadgets, jumping from one training system to another every two months all in the hopes of stumbling upon THE SECRET when we should be sticking to the time-tested basics over a long period of time. That's how every strong man in the history of mankind got that way.

As an interesting, yet perhaps not so surprising side note, many of the muscular vaudeville strongmen of the yesteryears resorted to selling expensive pieces of fitness equipment through mail-order. Equipment that had nothing to do with how they achieved their muscular frame and fantastic strength levels in the first place.

I guess that even a century ago, selling barbells, dumbbells and the idea of consistent, hard work to the masses proved to be a bad business decision, which would explain why these savvy entrepreneurial minds pursued monetary profits through the sale of exercise machines.

All You Ever Wanted to Know About Strength Training, Your Grand-Grand-Grand-Father Already Did

You'd think that in 2013, with all the breakthroughs in modern medicine, health care and exercise science, we'd be at the pinnacle of human health.

Not so.

At no point before in the history of humankind have we witnessed such increase in obesity rates and veered off the path in the pursuit of physical fitness as we have today.

If you wind the clocks back a century - give or take - you'll quickly realize guys already had all the stuff that mattered figured out.

A legendary pioneer of Physical Culture, strongman and wrestler George Hackenschmidt was among the strongest AND wisest lifters back in the day, as the following quotes demonstrate:

• “Health can never be divorced from Strength. The second is an inevitable sequel to the first. A man can only fortify himself against disease by strengthening his body in such manner as will enable it to defy the attacks of any malady.”

[...]

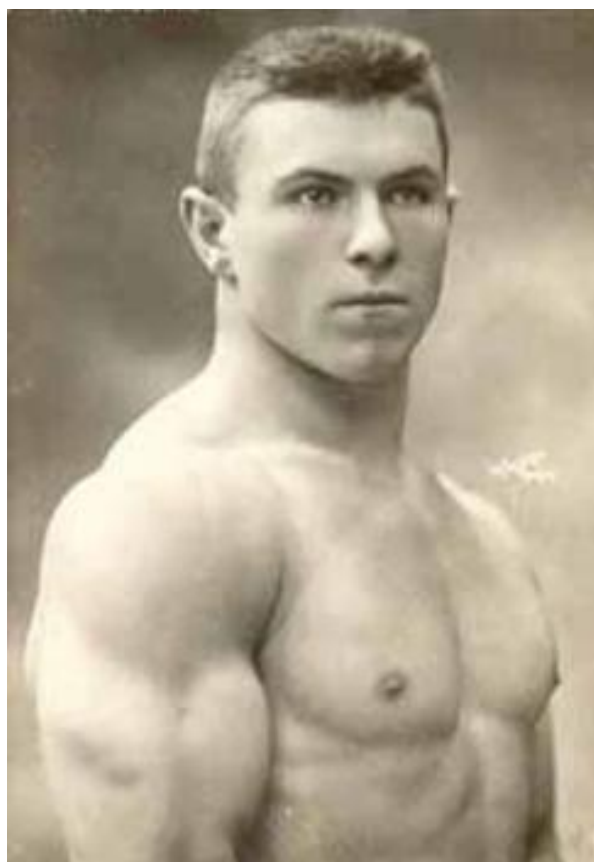
• “Now, apart from extraordinary causes, there is absolutely no reason why any man should ever be ill, as long as he keeps his body so physically fit as to safeguard it against any breakdown. Fifteen or twenty minutes' daily exercise will be all sufficient for this purpose. Surely no very heavy price to pay for such a valuable result.”³³

• “[T]here is always some time available every day which can be devoted to physical exercises and the care of the body. If you wish to become strong as well, you must attend to this, just as you

must find time for eating. And, again, if you do not find time to become and remain healthy, you will be obliged to find time to be ill. Surely some of the hours wasted on banal and often harmful pleasures might be devoted to physical exercise. ””³⁴

• ”” For it is only by exercising with heavy weights that any man can hope to develop really great strength. He should of course combine these exercises with skipping, running, jumping and gymnastics of every description in order to develop his activity and agility, but unless he sedulously carries out the bar-bell and dumb-bell exercises as well, he can never acquire really great physical powers. ””³⁵

What old George was saying is that being weak and ill is a choice as much as it is a choice to become strong and healthy, and you'd better ditch the excessive high-rep routines, move some heavy iron around, and work on your conditioning so you don't end up a fat-ass who's only good for moving big weights in the gym but can't run up a hill without suffering a heart attack.



Homeboy Hackenschmidt built a great physique with a barbell back in ca. 1905

And what kind of a progression plan did Hackenschmidt follow back in the day?

I'm glad you asked.

He advised beginning with a weight you can do 5 times and sticking with it until you can do it 10 times. Then you add 5 pounds to the bar and start over.

Pretty smart and simple, if you ask me.

For many young lads of the younger generations, their introduction to training with weights was seeing Arnold Schwarzenegger's incredible physique in Pumping Iron or later in the Terminator movies. Out of that random virtual encounter grew the desire to start lifting weights in order to one day waking up looking like him. What rarely anybody seems to be aware of, however, is that before Arnold moved to America, he was a competitive powerlifter and weightlifter in Europe. He became international and German powerlifting champion as well as Austrian Olympic lifting champ in the 60's.

After his last powerlifting competition his numbers apparently were:

- Squat 215kg
- Bench 200kg
- Deadlift 310kg³⁶

Why am I telling you all this?

When you go pick up a copy of a fitness magazine, you'll notice that rarely do you find information on how to get stronger even though it's one of the most important concepts of training with weights. (More on this in Chapter 7)

Look at the biggest guys at your gym and how they train. Most of the time, they're also among the strongest dudes in the place. Even though there's more to building muscle than simply lifting the maximum amount of weight on any given lift - and I'll be talking about this more in Part II of the book - a key element rarely anybody these days talks about is that **you can't separate performance from appearance.**

Male gymnasts and Olympic weightlifters in the lighter classes arguably possess the greatest physiques of any athletes today, and they train full body every day.

Hackenschmidt, Sandow and co. were the strongest men on Earth and also had the most well-developed physiques a century ago.

Not so surprisingly, when you look at old pictures of Arnold, Franco and other successful bodybuilders of the 60's and 70's, you'll see they were always moving big weights on the squat and deadlift.

Human physiology is not exactly a new concept to anyone, and no one is going to be reinventing it anytime soon.

Compare that with the fitness industry that promotes all the latest bells and whistles and whose message is that you need this and that gadget or supplement if you ever wish to gain an iota of strength or an ounce of muscle.

People want to use gimmicky bullshit to sell ideas or toys or methodologies when the truth is, nothing has changed in the strength training world in 100+ years. There are no secrets and the only tried and true shortcuts are anabolics.

What I'm proposing here is a change in the way we think, feel, act.

Let's go back to a time when being old school ruled.

When training for strength was a worthy pursuit, not something people scoffed at.

When guys practiced their lifts seeking mastery, not instant gratification.

When common sense trumped ridiculous hype.

When Iron and Wisdom prevailed.

PART II:

THE ANSWERS BECOME CLEAR

CHAPTER 6: CHOOSING FACT OVER FICTION



“Absorb what is useful. Discard what is not. Add what is uniquely your own.”

—Bruce Lee

If you got the idea that gaining a huge amount of strength or creating an impressive physique is impossible without resorting to steroid use after reading through Part I, then that was not my intention.

The truth is, you will never achieve the levels of muscular strength and size without drugs than you could by using them. Rather than let that upset you and give you permission to dive headfirst into a bag of donuts to alleviate the feelings of sorrow, you should embrace the fact as a cue to train harder and *smarter*.

A common trend with many gym-goers is to adopt and embrace the training practices of highly successful or well-known bodybuilders that can be found in muscle magazines or various online training forums. Although this strategy may be effective for a few, most trainees would be better served by constructing their own training regimen based on a good working knowledge of sound training principles and an understanding of their own physical limitations and needs.

Fact is, when you can't rely on great genetics or pharmaceutical assistance, you'll need to spend some time figuring out this whole "lifting weights" stuff to take you the extra mile.

Have you ever thought about what it takes to make a muscle bigger and stronger? Yeah, you go to the gym and lift a barbell or a pair of dumbbells - *duh!*

That's not what I mean.

What I'm asking here is, why do you do the things the way you do them?

I'm talking about why you did three sets of ten reps on the bench press in your last workout?

Why do you train a muscle group only once per week?

Why do you mostly train in the 10-15 rep range? How come you rarely (if ever) venture below 6 reps on a given exercise?

Why do you spend more time curling a dumbbell than exercising in or near the power rack?

Why do you go to the gym two hours at a time, five days per week?

Who said you can't get great results without annihilating your body, finishing the workout in a pool of your own sweat, blood and puke? And more importantly, why are you following their advice?

If you answered any one of those questions with "because so-and-so says...", then that's just not good enough.

Blindly following what other people claim makes you a clueless sheep.

When was the last time you looked over your training with a critical or downright scientific eye?

Likely on the seventh Sunday of Never. Yet you're basing all your training efforts on hearsay and anecdote, whether you got that information from a fitness magazine or a "fitness expert".

What I'm getting at here is that while strength training is not rocket science, it *is* a science. If you doubt that statement, I highly encourage you to familiarize yourself with the endless amount of strength training research available on PubMed or through various research journals. Or better yet, read a book by notable exercise scientists such as Siff, Kraemer, Zatsiorsky or Verkhoshansky.

All too often, the process of exercise and nutrition prescription in the fitness/strength training realm falls victim to myths, fads, zealous philosophies, marketing science, appeal to authority, ulterior monetary motives, emotional opinion and a massive quantity of misinformation stemming from lack of a fundamental understanding of the underlying principles (structural and nervous system adaptations, hormonal responses, etc.) that govern human physiology and performance.

When put under scrutiny by utilizing a scientific approach, many of the common exercise/dieting recommendations being circulated (or should I say, parroted) in the mainstream media turn out to be nothing more than myths or make-belief advice with very little substance to support these claims. Basically, when it comes to fitness information aimed at the general public, recommendations based on "gym science" trump real science.

Some of the most blatant examples of this moronic tripe are claims like "eating egg yolks clogs your arteries", "squatting deep destroys your knees" or that "machine training is safer than training with free weights".

What a load of unverifiable BS!

I could go on a rather long-winded rant about what is wrong with the current state of affairs regarding common training recommendations in the lay press but let's reserve that discussion for another day, shall we?

My point, in case I wasn't obvious enough, is this... **There has to be a framework in place that describes what constitutes conducive and effective strength training, and within which we're going to operate.** And that framework needs to be based on sound, scientific principles, not just the gut-feeling of an "authority".

The problem with the fitness industry is that most "experts" and "gurus" will tout their methods as being superior to all others. Everyone claims to have THE MAGIC FORMULA™ that will turn you into a hulking specimen in the blink of an eye. However, when you look past a mere 12-week training program and compare their underlying philosophies on lifting, you'll notice that they think along the same lines 90-95% of the time - at least those who carry any respect among their peers in the industry. The wackos and those who clearly make up their own stuff, well, their ideas of what

quality training looks like are so over the top that we will disregard them in the context I'm discussing now.

You can bet the farm that any respectable strength coach worth listening to will tell you this:

- Lift, drag, carry, push, pull heavy objects.
- Get stronger on the basic lifts.
- Eat "quality foods" most of the time.
- Work on your conditioning and stay in shape.

You'd think that'd be it, right? It doesn't get any simpler than that. But boy, do people - especially on the Internet - love to get into heated arguments over stuff that matters very little in the long run.

High bar or low bar squat, which is better? Depends.

Which is a "healthier" choice for dinner, an omelet and vegetables or tuna and rice? Depends.

Should you use kettlebells or hill sprints or sandbag carries or bodyweight circuits to bring up your conditioning? Depends.

There's no one best way that suits the training and nutrition needs of every single individual on this planet. Nevertheless, what we can do is create a foundation of solid ground based on certain core principles by sifting through the information that is available to us, critically review said information and organize it into an applicable model with which to start our journey towards better health and performance.

At this stage, I'm quoting Jamie Hale again...

“ [D]on't be afraid to question authority and conduct your own research. Realize that the only true authority in science is science itself. Approach fitness and nutrition with an open mind and realize that the majority of information you have probably been exposed to is misleading, and in some cases, deceitful.

Keep up to date with the current research.

Don't be afraid to debate your beliefs.

Never judge an individual's exercise and nutrition knowledge by his or her degrees, certificates, physique, or athletic ability, but by his or her passion, ability to explain, and willingness to debate beliefs and proclamations. Not many of the so-called fitness experts are willing to debate their statements when challenged. If you are not willing to debate your statements with formidable opponents, you shouldn't be making those statements. 🗨️³⁷

On the flip side of the coin, unfortunately, is the fact that studies can be spun to back up or refute basically any individual claim or opinion. People love to argue over minutia, and it's not all too uncommon to witness them resorting to cherry picking hard facts in the middle of a heated debate, citing irrelevant data and ignoring significant findings in an attempt to further cement their own position.

Thus, I've gotta emphasize that although extremely valuable, scientific studies are not the end-all, be-all source of training information because often theories that sound reasonable on the flipchart of a lab coat wearing science geek fall apart with real people in a real world setting. Most research that the mainstream media uses as "unshakable proof" in their articles is conducted on non-athletes, or even worse, on the sedentary population. As such, logic would tell us that the training and nutrition recommendations aimed at an obese desk jockey that we see in these publications are hardly optimal for an athlete looking to maximize his physical abilities and performance in his sport.

Someone (I can't remember where I heard this) once stated quite fittingly that "mainstream media is 5 years behind research studies... research studies are 10 years behind what people are already doing for health and results."

Not everything that is in a textbook or medical journal is automatically the ultimate, non-negotiable truth.

What I'm getting at is that we must look to science for answers but we also can't disregard a method that clearly *works* on the basis that its efficacy hasn't been verified via a controlled study in a lab setting.

Some of the strongest and most ripped guys on the planet probably have never heard about the two-factor theory of training, de novo lipogenesis, the Golgi tendon organ, fiber hyperplasia, Compensatory Acceleration Training, the mTOR pathway or even the Pythagorean theorem, and they're likely to care about that stuff as much as Donald Trump cares about spending an afternoon at the hair salon.

Consequently, to paraphrase the famous quote by Bruce Lee, we want to absorb what is useful, discard what is not, and add what is uniquely our own.

For this chapter, I've pored over the research and done my very best to present a working model for strength and muscle gains based on what science today has to say on the topic, what some of the most respectable strength coaches in the field have discovered, and my own experiences. Many, many questions are still left unanswered (and some may stay that way forever), but after you've read through this part of the book, I guarantee you will view your current training methods in a completely different light.

Lofty statement? For sure.

Before we get there, I want you to remember one thing as it pertains to the quest of getting stronger and building muscle...

All you can ever do is strive to maximize your own genetic potential. Forget about trying to "look like a white Alistair Overeem" or whatever it is that you use as a measuring stick. I guarantee that that very road is paved with endless frustrations and discontent. You can never be truly happy with yourself if you're trying to live up to other people's standards.

The one question you should repeatedly be asking yourself is this:

"Am I doing everything in my power, *right now*, to maximize the likelihood of reaching the goals I've set for myself?"

If you answered no, you probably already know what you need to fix. So get to it ASAP. If you're lacking guidance, I hope that by the end of this book you will have a firm idea of what needs to be done.

If you answered yes, then there really is no point in fretting about anything. Just trust the process and enjoy the journey. It may take you a long time (or forever) to get to your destination, but what else is there to do?

See how damn simple it all really is?

Now that we've got that out of the way, it's time to find the answer to the question that keeps every young male awake at night...

"Just how do I get to tap Brandy Bubblebutt, that voluptuous little minx who sits across from me in Marketing 101?"

No..?

Oh well, maybe it's just me.

I guess what you really wanted to know is...

How should a drug-free, genetically average guy train for strength and muscle gain?

Overview

Before we seek answers to that question, we first need to define a few strength training concepts to ensure we're on the same page, speaking the same language.

Volume, frequency and intensity are all interdependent elements in designing progressive strength training programs.

Let's kick things off by defining these concepts.

- Volume = how much total work you're doing in a given session, week, month or training cycle
 - rep-volume (sets x reps)
 - load-volume (sets x reps x weight)
- Intensity = relation to your 1RM (1 repetition maximum) on any given lift in percentage (i.e. 90% of 1RM)
- Frequency = how often a lift is practiced or a specific muscle group is being trained
- Intensiveness = how hard the trainee perceives the training to be (i.e. rate of perceived exertion or RPE)

Now, when I say these elements are intertwined, it means that alterations in any one of them determines what the others will end up looking like. Similar to a complex math assignment, you can't randomly change one variable without taking the other variables into account, and expect to solve the equation correctly.

The manipulation of training variables (intensity, volume, frequency, exercise order, rest periods, etc.) is determined by the goals of the program and the needs of the individual.

Entire books have been written on the topic of programming these variables for elite athletes. Some of those lay out detailed instructions for an entire Olympic cycle (4 years).

For our purposes, though, it's enough to understand that every element influences the other and that there generally is an inverse relationship between the elements. For instance, when volume goes up (you do more sets, reps and/or total weight), frequency (how often you train) and intensity (% of your 1RM) need to be adjusted accordingly, so that your body is allowed enough time to recover from the increased muscular and neural stress that added training volume places on you.

Disclaimer

First off, let me unhesitatingly state that some of what I say on the following pages may resonate with you and some of it won't. **There are times when I'm right and – despite my best efforts to double- or even triple-check my sources – sometimes I will be wrong.** That's life.

What I thought was the truth yesterday might be something else tomorrow. **My theories and practices will evolve as a result of the accumulation and application of new knowledge combined with the information I've already gathered.**

Thus, the following guidelines are simply MY interpretation of current strength training research, and real-world applications for a drug-free trainee with average (or below average) genetics. Hence, these principles work extremely well for at least 80% of the population.

But you shouldn't trust me blindly - or anyone else for that matter. I could be wrong.

As I've always said, **the best thing anyone can do is learn to decipher research journals, seek out guys who have actually gotten results for their clients (you'd be surprised if you knew how many "experts" out there are clueless posers), think for yourself and not fall for inaccurate, ridiculous claims, experiment like crazy on your own and draw your conclusions based on all of those.**

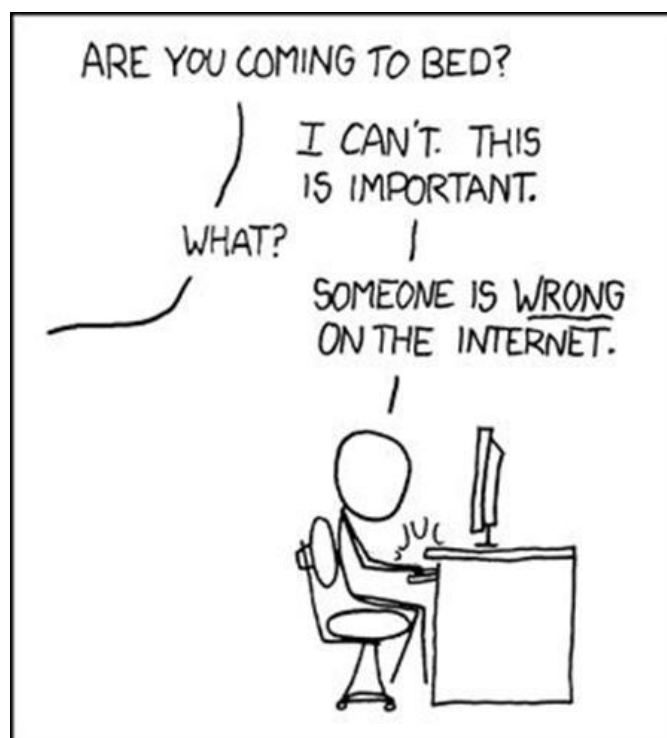
I felt this needed to be emphasized since it's a rare breed of human beings who are inclined to have an intelligent discussion on anything that has got to do with any aspect of physical fitness. People will rather argue just for the sake of arguing, which anyone who has ever visited an online training forum can readily attest to.

How many times have you heard someone counter your arguments with "Ok, I get your point but I disagree and here is why..." and generate some intelligent discussion on a message board or even face-to-face?

Practically never. Why?

Because the majority of people aren't out to obtain wisdom or generate intelligent discussion with an open mind. Nobody wants their deeply held beliefs challenged. What they really are after is having other people validate their opinions, and tell you how wrong you are because it runs counter to what they think. Nothing feels better than proving others wrong and having your ego stroked.

Some guys have their self-worth rooted in how they look on the outside, not in what they contribute to the world around them. Many others enjoy starting flame wars on the Internet without the tiniest intent to hear what the other guy has to say, even if his opinions carry a ton of merit. Faceless know-it-alls hiding behind cutesy usernames clinging to old dogma, spreading antiquated training and nutrition myths, doing everything in their power to prove they're right and somebody else is wrong...



On a more personal note, I can't tell you how many times I've had someone ask me for my opinion on what they should do with their training and nutrition, only to find out that they never had any real desire to follow my recommendations in the first place. They had already made up their mind on what they were going to do long before getting in touch with me, and were now simply looking for outside validation for their predetermined intentions.

"Yeah, I hear what you're saying about me needing to squat and deadlift heavy. But I already play soccer and ride a bike several times every week. So I don't think I need to train my legs any more than that, they're already pretty strong. But thanks anyway."

Yup.

Somehow this fitness stuff makes fools out of all of us.

CHAPTER 7: PROGRESSIVE OVERLOADING - THE MOST OVERLOOKED FACTOR IN STRENGTH TRAINING



“Anyone can make someone tired. Not everyone can make someone better.”

—Martin Rooney

The single biggest reason why people don't see remarkable changes in their strength levels or physique is because they don't adhere to the principle of progressive resistance training - a.k.a. Law of Progressive Overloading.

To bring about positive changes in an individual's state, an exercise overload must be applied. A training adaptation takes place only if the magnitude of the training load is above the habitual level.

During the training process, there are two ways to induce an adaptation. One is to increase the training load (intensity, volume) while continuing to employ the same drill (for example, the back squat). The other is to change the drill (i.e. from back squats to front squats), provided that the exercise is new and the individual is not accustomed to it.

If a trainee uses a standard exercise with the same training load over a very long time, there will be no additional adaptations and the level of physical fitness will not substantially change.³⁸

Instinctively, this would make sense. I mean, think about it... If you did the same workout with the same resistance and same amount of repetitions (while keeping rest periods identical) today that you did three months ago, why should your body have gotten any stronger or your muscles bigger?

You have failed to provide the body with a sufficient stimulus to overcome its current level of physical fitness, and consequently it has had no reason to undergo any further adaptations.

Now, most gym-goers may be ignorant when it comes to exercise science but they're not completely stupid. When they notice that what they're doing is not giving them the results they're seeking, they realize they've got to change something in their training.

So what do they do next?

They increase the *quantity*, not quality, of exercise.

More exercises.

More sets.

More reps.

And yes, all of these present the body with a new stimulus it's not accustomed to, so that may work for a while.

But what happens when you hit another plateau?

Do you introduce *even more* exercises, sets and reps into your regimen?

You can't keep increasing volume forever. There definitely is a point of diminishing returns when it comes to increasing the amount of work you do in a given training session, beyond which any additional gains are pretty much non-existent. (More on this in Chapter 9)

It appears that once a given "optimal" volume is reached, a further increase in training volume does not yield more gains and can even lead to reduced performance. Unfortunately, the optimal volume

stimulus for the development of strength and the effectiveness of stimuli within the training process have not been satisfactorily solved as of this writing.³⁹

Besides, we need to factor in the time commitment that a high-volume plan requires of you. You don't want to spend all of your free time inside gym walls. Life is too short for that.

We want to have *enough* volume to ensure that sufficient work has been done to incite further positive strength and size adaptations, but not at the cost of training intensity.⁴⁰

Thus, what it really boils down to is upping the intensity, and cutting out all the unnecessary junk and clutter in your program that has practically zero effect on your strength levels.

I've noticed a strange tendency among clients when they first come to me. For many of them, the effectiveness of their current training plan is measured by how many buckets they can fill with their sweat during a training session or how much pain they're experiencing when they wake up the morning after it.

You can do all the drop sets, partials, slow negatives, cluster sets and forced reps in the world without getting anywhere unless and until you're getting stronger.

“ One of the most commonly held beliefs by trainees is that if you aren't sore after your workout, it wasn't a good workout.

Let me say this for the millionth time.

Soreness isn't an indicator of a conducive workout. Trainers and coaches who thrive on making athletes sore or getting them to puke need to find a new job.

It doesn't take much knowledge to design a workout that induces fatigue or creates severe discomfort. If fatigue and discomfort were the only requirements for a successful training regimen, you wouldn't need anything more than intense calisthenics (burpees, mountain climbers, star jumps, etc). ”

[...]

“ If soreness was an indicator of quality workouts, some high level athletes would be sore all the time. This would detract from their sports skill training. There is no evidence that muscle soreness (or even the pump or transient fatigue) is necessary to induce hypertrophy or maximal strength.

Feeling tired and sore all the time is one of the biggest reasons why newbie trainees drop out of their workout regimens. Most of the time their friend or trainer told them that if they weren't feeling the pain, they weren't doing anything. Following this advice, trainees may push themselves too hard or too long. Exercise is supposed to make you feel better, not tired and beat down all of the time. When exercise starts negatively affecting all of your other life activities, it's time to reevaluate your program. Sometimes you'll feel tired and beat and this isn't necessarily bad on occasion, but it shouldn't be a chronic condition. ”⁴¹

Word.

Recently, Schoenfeld and Contreras reviewed the applicability of DOMS (Delayed Onset Muscle Soreness) in assessing workout quality in detail and concluded that it is "inherently limited, and it therefore should not be used as a definitive gauge of results".⁴² Furthermore, they noted that "chasing" soreness is not only unnecessary but counterproductive, and high muscle damage can compromise strength gains due to excessively long times needed for full recovery.⁴³

Research has generally demonstrated significant reductions in strength/power parameters associated with DOMS.⁴⁴ Excessive training volume and the soreness following it adversely affects strength and power production, which consequently leads to decreases in an athlete's ability to express these qualities in a competitive setting, such as performing the vertical jump in the midst of a basketball or volleyball match.

Any idiot can give you a program that'll leave you puking into a waste basket but it doesn't mean you made any real progress following it, nor does it guarantee any improvement in the athletic qualities you're hoping to boost through resistance training.

A typical client case I encounter looks like this... A guy has been going to the gym for a long time (often several years) without having made any significant progress in a while. Previously, he has been doing too many sets and reps, and usually training too often and for too long at a time, so when we cut the volume and increase intensity (by having him add weight to the bar as often as possible), he begins making progress lightning fast and thinks it's some sort of a miracle that he has achieved better results in a span of a few months than training on his own for the longest time.

The reality - while my ego certainly would prefer me being called a miracle worker - is not that simple. We simply had the client focus on chasing strength related goals instead of a pump, high heart rate or burning 6000 calories in an hour for the time being, and the most effective way for a beginner to get there is via progressive overloading on a handful of exercises.

Back in 1981, a fellow named John Atha published a research paper called "Strengthening Muscle", which outlined strength training guidelines based on available scientific data up until that point in time.

Matthew Perryman summarized Atha's findings in his excellent e-book, *Maximum Muscle*, from which the following quotations are taken...

“ [W]hat he [John Atha] found from all that data is that the weight on the bar is more important than anything else. It's the magnitude of the work – the intensity, or weight on the bar, that matters. If you're not handling heavy weights, or at least heavy-enough weights, you're not working in the most effective zone. ”

[...]

“ The implication here is that you need to be using weights that are heavy and challenging. You also need to work to get stronger, simply so you can handle heavier weights later on. Atha's review reached the conclusion that it wasn't necessarily the heaviest weight, your one-rep maximum (1RM), that caused the best growth, but rather an optimal weight that was somewhat less than your best. ”

Your body's response to a given weight forms a *dose-response curve*. On one end, you get weights that are too light; they can't cause the required mechanical stress. If you go too heavy, you'll cause stress, but you won't be able to do enough of it to matter. Moderate weights that lie in the middle ground, between 70% and 90% of the 1RM, end up being most productive. 🗨️⁴⁵

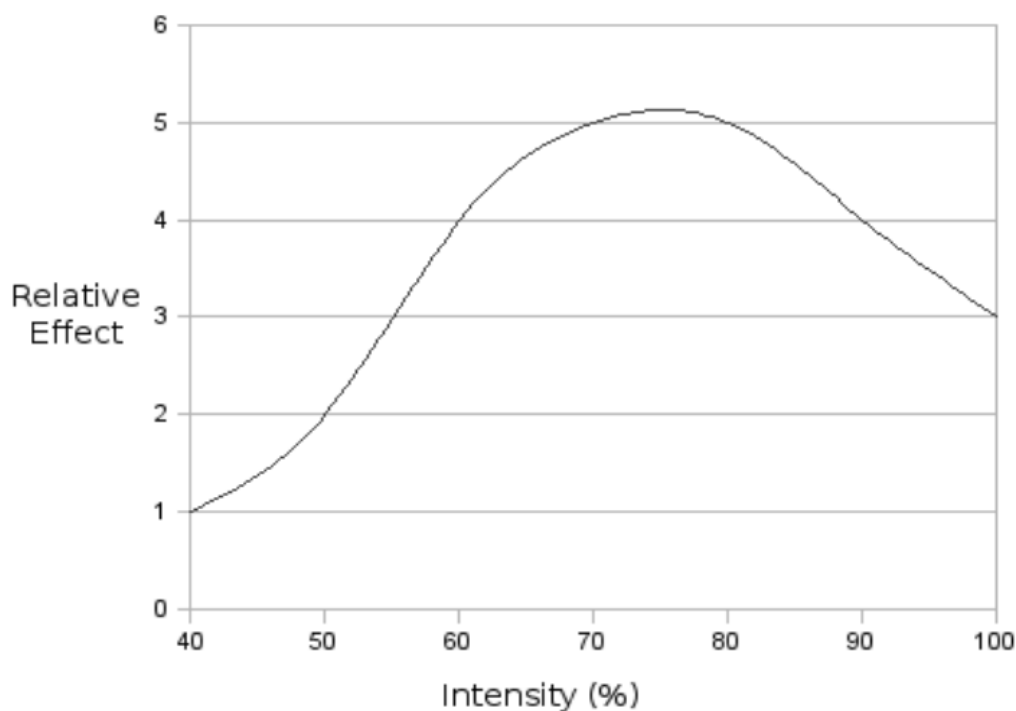


Figure 3. *Dose-response curve of intensity to relative effect.*

I will be discussing intensity and volume for individuals at different phases of their training career in Chapters 10 and 11. For now, the key takeaway is that at some point (and hopefully sooner than later), you need to lift more weight to gain more strength and size.

That is the essence of strength training.

Before we wrap this section up, I want to address a question that I often hear from people who have been training for a while and have already experienced their "newbie gains".

"What if I'm already happy with the strength levels I've obtained?"

Personally, there's nothing more exhilarating in training than beating a previous best. So I can't

imagine any genuinely ambitious person ever being truly content with what they've achieved. Especially considering that there are athletes out there with multi-million dollar contracts in their back pockets who keep on honing their craft day in, day out, striving to be the best at what they do by a long shot.

Usain Bolt has his eyes set on breaking his surreal world record of 9.58 in the 100-meter dash.

Sidney Crosby once spent an entire summer working on his face-off and shooting skills, two areas he was merely average in, after having won the Hart Trophy as the best player in the NHL. Now he's a reliable face-off taker and has a "Rocket" Richard Trophy under his belt as the best goal scorer in the league.

The day you think you've "made it" is the day you stop getting better.

Complacency breeds failure.

But so that you know, the volume of training required for maintenance of strength is much less than that required achieving a given strength level, although intensity in a maintenance program must still remain sufficiently high.⁴⁶ Regarding frequency, 1-2 training sessions per week are sufficient to maintain a given level of strength.⁴⁷

If you merely desire to keep the strength levels you've achieved so far, you don't need to perform much work in terms of quantity (volume) or frequency but the quality (intensity) still needs to be present in your workouts.

Bottom Line

Effective training in its simplest form is applying a new stress to the body that it is not used to or prepared for, which forces adaptation when the body has recovered from this new stimulus.

The variable we manipulate for effective barbell training is not the number of exercises – it's the load. Increasing your strength by increasing the load is what makes you strong, and the process of getting strong enough to need to grow is what makes you bigger.⁴⁸

Rather than judge a training session by the amount of sweat your body produces in an hour or how sore you feel the day after, you want your training to be productive and the way we measure productivity in training is by looking at the weight on the bar and the numbers in your training journal. If they're going up, you're on the right track.

CHAPTER 8: HOW OFTEN SHOULD I TRAIN?

Training frequency is one of the most heavily debated aspects in the world of strength training today.

If you were to believe the fitness magazines, a 4- or 5-way split is the way to go for everybody.

And no, I'm not talking about you and multiple scantily clad females in a Girls Gone Wild flick. If only... if... only...

In a split program you split the body into several muscle groups and typically train them with a high-volume, low-frequency approach, so that every muscle group receives a training stimulus only once per week. Below is a sample of what this way of structuring your workouts often looks like:

Day 1 - Legs

Day 2 - Chest

Day 3 - Back

Day 4 - Rest

Day 5 - Shoulders & Traps

Day 6 - Arms & Abs

Day 7 - Rest

Furthermore, some people believe that lifting weights any more than three times per week will quickly lead to overtraining. Clearly this erroneous way of thinking has gained a steady foothold in the minds of many gym-goers, because I often feel like Bill Murray in Groundhog Day when answering questions on why low frequency training is not a very effective method of gaining strength for beginners over and over again. Though what separates Bill and me is that his waking hours are filled with rock star moments, trying to get into young Andie MacDowell's panties and coming up with endless ways to kill himself just for kicks, whereas I spend a considerable amount

of time reading research papers on strength training, an activity right up there with geocaching and participating in LAN parties as a tell-tale sign of incurable nerd-dom.

Then, at the other end of the lifting spectrum, you've got proponents of high frequency methods (especially Olympic lifters implementing the Bulgarian method), who perform full-body workouts every day, multiple times per day - such as followers of Olympic lifting coach John Broz.

"John believes that everyone can and should train every day. He starts lifters off right away with daily heavy squatting and broomstick or empty barbell Olympic technique work.

Over the course of a year, lifters gradually work their way up to 13 training sessions per week – twice a day Monday through Saturday, and once on Sunday. Morning sessions last between 45 and 120 minutes; evening sessions between three and four hours for a total of approximately five hours of lifting per day.

*The Broz Olympic Method involves only six exercises: the snatch, clean & jerk, power snatch, power clean, back squat, and front squat. **Each of the 13 sessions includes heavy squatting, either back squats or front squats.**"⁴⁹*

As is often the case, what is optimal for a natural guy with average genetics and limited time falls somewhere in the middle of both of these extremes. Since you're reading this book I'm going to assume that you're neither a competitive bodybuilder or weightlifter (or looking to become one), willing to devote hours every day honing his craft, but a regular dude with a full-time job or studies looking for ways to get more hunky in the process of lifting weights.

Strength Is a Skill

For all intents and purposes, there are three essential scientific facets you need to understand about training for strength. Everything else is secondary and beyond the scope of this book. If you're interested in learning about scientific reasons and applications behind strength training that run much deeper than what we cover here, check out the resources section at the end of this book.

1. Strength is proportional to the cross-sectional area of a muscle, so that **larger muscles have the potential to develop greater strength than smaller muscles.**⁵⁰

2. Muscular strength is determined not only by the quantity of involved muscle mass but also by **the extent to which individual fibers in a muscle are activated** (by intramuscular coordination).⁵¹

3. Training adaptations are highly specific. This principle dictates that **the results you get from training are specific to the type of exercise you perform and only those muscles exposed to a training stimulus will increase in strength.**^{52,53} The specific movement pattern used in training is where most strength improvement will occur, even when different exercises involve identical muscle groups. Consequently, if you wanted to improve your 1RM on barbell squats, your time would be better spent on doing a lot of barbell squats to proper depth rather than nonspecific exercises such as leg extensions, leg presses or half-squats.

As a certain famous Finnish hockey coach - when he's not too busy boasting of his previous accomplishments or explaining how hockey is a momentum game - is fond of saying: *"You spend a lot of time sitting in a bus, you'll become great at sitting in a bus. Spend a lot of time playing hockey and you'll become a great hockey player."*

I'm sure you get the point.

Boiling it all down, there are two ways to get stronger. One way is through hypertrophy (gaining muscle mass) and the other is through becoming neurally more efficient.

These two factors combined with the principle of training specificity, which states that to improve in a particular area you must emphasize that area in training, allow us to understand why some "small" guys can be just as strong as a "big" guy - and often times much stronger than him.

Strength improvements tend to be maximized with a limited number of exercises because **maximal strength is highly dependent on neuromuscular factors involving the connection between the brain, nervous system and muscles.**⁵⁴

When you have a guy repeatedly exposed to progressively heavier and/or more challenging exercise variations, especially in the lower (1-5) rep ranges, the nervous system and muscles become exceptionally adept at producing strength without an accompanying increase (relatively speaking) in muscle mass - especially when keeping volume moderate.

That's the reason why male gymnasts, Olympic lifters in lower weight classes or the guys who train in a ghetto and can perform 23 muscle-ups in a row on YouTube can become so extremely strong and perform ridiculous feats of strength in spite of not being humongous when compared with bodybuilding standards.

They simply constantly coax (not force!) their nervous system and muscles to become more efficient by always finding ways to further challenge themselves in training either by utilizing heavier loads when using a barbell or moving on to progressively more demanding exercise progressions and variations when using their own body weight as resistance.

Now, what does this all mean in terms of training frequency?

Simply put, if you want to get good at barbell squats/chin-ups/power cleans/L-sits/pistol squats/whatever, your time would be best spent learning these movements with a high frequency. If we took two twins with a similar training history and initial strength levels, while keeping their diet, recovery etc. identical, which one of them would learn those movements faster - the guy who trains the movements every day (or as often as recovery permits) or the one who trains only once per week?

The answer is obvious.

High frequency training trumps all other approaches when the goal is learning a skill (a movement) in the shortest amount of time possible.

So does this mean you should train with weights every day?

Stress

The biggest limiting factor to a high-frequency training plan is your ability to recover from the previous workout. Every time you lift weights, you're placing stress on your muscles and the nervous system.

A lot of people are obsessed with figuring out the right training stimulus (how many reps, sets or training sessions they need), yet they neglect the other side of the coin - recovery.

Remember that optimal progress (gaining muscle and strength on a weekly or monthly basis) will only be achieved through optimal recovery from a training stimulus.

Whether you train a muscle group once per week bodybuilder style or conduct multiple strength training sessions a day like a weightlifter, much more important than how often you lift is that you're actually getting somewhere with your training.

There's no point going to the gym if you're not there to make progress.

Sure, there are times when a lighter deload week or even a longer restorative period is warranted - especially if the previous cycle was physically and mentally a very demanding one. Pro level athletes take a break from heavy training after the competitive season to allow for sufficient recovery.

But subsequently, when they return back to the gym, it's again all about spurring new progress. And the only way to continuously move ahead is to maximize your capacity to recover, which in turn will translate into strength and hypertrophy gains when coupled with a sufficient training stimulus.

Moreover, many people believe that they only need to factor in the stimulus of a weight training session as a potential stressor.

Not true.

Life, in and of itself, is a huge source of stress. A jerk for a boss, repeated fights with your spouse, colleagues who never can get their duties done, idiots in traffic, that goddamn piece of shit TV that shut down for good in the middle of your favorite team's game... together they all take a toll on you mentally as well as physically.

Consequently, all of this affects your training and ability to recover from it in a negative way.

On the other hand, if you've got no obligations in life (working for money, attending school or taking care of family) besides eating, sleeping, lifting weights and banging some quality trim on the side, you'll very likely be able to train more often.

So, to the question "How often should I train?", my answer is:

As often as possible.

Which, stated a bit more comprehensively, means that **you should train as often as possible while making quantifiable progress.**

Does this mean YOU need to go to the gym 6 times per week?

No.

As I hope has been made clear in this chapter, optimal training frequency is highly individual and related to factors beyond what goes on in the weight room.

There are, however, certain time-tested guidelines that work extremely well for someone relatively new to proper strength training who has got a life outside of the gym.

McLester and others witnessed greater strength and muscle gains in trained subjects who worked out with a higher frequency of 3 weekly training sessions as opposed to 1x/week, even though training volume was equal for both protocols.⁵⁵

Data from Wernbom and co-workers suggests that 2-3 training sessions per muscle group/week for novice to moderately trained individuals maximizes the hypertrophic response.⁵⁶

According to a meta-analysis of Rhea and colleagues, untrained participants experience maximal gains by training each muscle group 3x/week and trained individuals 2x/week.⁵⁷

Consequently, a beginner is generally best served with 3 or 4 strength training sessions a week from both a mental and physical standpoint.

Many people, when beginning a new training plan from scratch believe that more is always better. You know how the line of thinking goes: "Starting Monday morning, I'm gonna wake up at 6 a.m. to run five miles on an empty stomach, hit the weights for two hours after work and repeat this Monday through Saturday until I'm ripped. EASY!"

Nonsense. Too often people visualize plans of glory in their minds that ultimately prove to be impossible when additional circumstances such as work life, family stuff and other stress factors need to be taken into account.

What we're looking for in the beginning, first and foremost, is **adherence to a solid training plan over a longer time frame**. Every January thousands of new members give a financial boost to local gyms by acquiring expensive yearly memberships, only to have seemingly vanished from the face of the Earth for good in less than two months.

It's better to start out conservatively than it is to go balls to wall from the get-go, eventually burning out and quitting altogether on week 7 because your expectations were too inflated. People need to realize that it takes a while to get lasting results, and that training is not something you do for a limited period of time. The goal is to turn exercising, eating healthy and improving your own physical and mental strength into a LIFESTYLE that you enjoy doing without any outside pressure being put onto you.

Lest you think it's necessary to go hard and heavy every day, I assure you it's not.

Even some of the biggest names in strength sports have trained successfully with only 3-4 times per week. Kirk Karwoski trained 4 times per week on an upper/lower split.⁵⁸ If the name doesn't ring a bell, go check out his ridiculous 1000 pounds for 2 reps squatting performance on YouTube.

On the other side of the coin, we have people who have been brainwashed into thinking that getting results should require minimal effort and zero dedication. Everybody wants to achieve amazing results by training a minute a day, two times per year.

Personally, I'm sick and tired of seeing commercials of gimmicks that promise extraordinary results with just 8 minutes of exercise every other day.

Really?! I don't know anybody strong and lean who spends so little time on training. I train at a powerlifting gym with some big and strong dudes and I can tell you first-hand, they all go there several times per week for an hour or so at a time.

Whoever is claiming that you can get great results without putting in a considerable amount of time and effort, is trying to make excuses or sell you something, and should not be listened to.

Bottom Line

Optimal training frequency is dependent on your ability to recover from the previous training session - and other stressors in your life. If you're not constantly making progress in the gym, you're either under-recovering or waiting too long between workouts.

Generally, training 3 days per week on a full-body routine or 4 days per week on an upper/lower split produces the best results in novice to intermediate lifters.

For the more genetically gifted, training basic lifts with a higher frequency (Olympic lifter style), or splitting their training efforts based on movements (push/pull/legs) or body parts (chest & shoulders/legs & back/arms & abs, etc.) can be a productive way to arrange their workouts beyond the beginner stage.

CHAPTER 9: WHICH EXERCISES SHOULD I BE DOING?

The biggest fitness fallacy is that beginners need a lot of variety in terms of exercise selection. No, they don't. What they need is a handful of big, compound movements – pulls, presses, chins, rows, squats and deads – and training them with a (relatively) high frequency, perfect form and progressive overloading.

Ironically, those are also the exercises that nobody wants to do. I mean, they require a lot of effort and are potentially dangerous, right?

Strength is developed by exercises that use lots of joints and lots of muscles moving lots of weight over a long range of motion. Fundamental strength exercises like the squat, the press, the deadlift, and the bench press, along with power exercises like the clean and the snatch, always form the basis of any strength and conditioning that is actually useful to an athlete, irrespective of the level of training advancement.⁵⁹

In the beginning, you'll want to limit the amount of exercises you perform to just the basic barbell lifts, and bodyweight and dumbbell "assistance work". By focusing all your efforts into mastering these select few lifts instead of performing 137 different exercises in the span of four weeks, you'll not only be able to clearly track the efficacy of what you're doing but also master proper form much faster.

Training the same lifts with a higher frequency hardwires neuromuscular patterns, thus enhancing both intra- and inter-muscular coordination. Because strength gains highly depend on neuromuscular efficiency, strength is best maximized by performing the same basic movements on a regular basis.⁶⁰

As a result, this will allow you to make the fastest strength gains you'll ever make in your entire life.

A guy who goes from squatting 60 kg for 10 reps will be a bigger and stronger version of himself when he can squat 120 kg x10. And the only way to do that as quickly as possible is to SQUAT OFTEN. No amount of leg presses, leg extensions or leg curls will provide the same type of training stimulus (remember that training adaptations are specific to the type of exercise you perform).

Main and Assistance Exercises

Below is a short list of main and assistance exercises for illustration purposes.

- Main Exercises:

- Squat
 - Deadlift
 - Bench Press
 - Overhead Press
- (and their variations)

- Assistance Exercises:

- Chin-Up
 - Dip
 - Push-Up
 - DB Split Squat
 - Hip Thrust
 - DB Bench Press
 - Ab Wheel
- etc.

Assistance work is designed to...

- prevent strength imbalances
- build muscle
- strengthen weak areas and
- assist the basic lifts (squat, bench press, overhead press, and deadlift; or whatever lifts you deem important in your training)

What about isolation exercises?

While many people these days in the strength & conditioning realm of fitness shun training body parts as "non-functional", the truth remains that there is also a place for isolation movements in a properly designed strength training program.

Isolation exercises "fill in the gaps", so to speak. The fact of the matter remains that you need direct isolation work for smaller muscle groups if you want to maximize your muscular potential. Yes, there are guys who can get insanely big and strong with merely the basic lifts but exceptions don't make the rule.

Besides, who of us wouldn't want bigger arms? Training for strength and hypertrophy always bears a certain vanity factor. Ain't nothing wrong with that. Pumping iron beats Pizza Night in front of the telly every time in my books.

A lot of it is mental, as well. I've literally had guys get bored out of their minds with their training routines by prohibiting direct arm work in the beginning, so that they would focus all their efforts into getting stronger on the main exercises. It's not that these isolation sets make that big of a difference physically when you're just starting out⁶¹ but guys love to train arms. So I let them get the pump going *after* their more productive sets are done. I'm nice like that.

Exercise Order

Typically, what you do first in a workout is that which ranks highest in importance.⁶² While for many guys bench pressing and curls fit that description and are performed before any other exercises, there's a better way to organize resistance exercises for optimal results.

The most demanding neural work should be done first, meaning that high velocity work and/or low rep work should be done first in the workout. Because power exercises - such as the snatch, hang clean, power clean, and push jerk - require the highest level of skill and concentration of all the exercises and are most affected by fatigue, they should be performed first in a training session, followed by other non-power main exercises, and then assistance exercises. Some people also refer

to this arrangement as "multi-joint exercises and then single-joint exercises", or "large muscle areas and then small muscle areas".⁶³

In other words, power cleans would be done before squats, since acceleration is critical in the performance of a power clean, and the nervous system has to be more fresh to perform a heavy set of power cleans than a heavy set of squats.⁶⁴

Another thing to keep in mind is that executing exercises involving large muscle groups before smaller muscle groups in a training session will maximize the total amount of weight lifted and repetitions completed during that session.⁶⁵ Performing an upper body assistance exercise - such as triceps extensions - prior to a barbell bench press will negatively affect your performance on the main lift since the triceps are already in a fatigued state from the triceps extension exercise.

Interestingly, switching the exercises around and performing the bench press exercise prior to the isolation exercise for the triceps will not have any adverse effects on your ability to perform the latter due to the fact that smaller muscles will be well challenged and overloaded during a heavy resistance training session whether done first or last.⁶⁶

When it comes to specific skill work, such as pistol squat or handstand progressions, that should be scheduled at the beginning of a workout while you're still fresh. You can implement those movements either as a part of your warm-up, as the first or second exercise right before or after a power exercise (depending on which training aspect you deem most important), or in a completely separate training session on off days.

Below you can see what this would look like in a sample lower body workout.

- | | | |
|---------------------------|----|---------------------------------------|
| 1. Pistol Squat | -> | Skill work |
| 2. Power Clean | -> | High velocity (power) exercise |
| 3. Front Squat | -> | Low rep strength exercise |
| 4a. Bulgarian Split Squat | -> | Lower body assistance exercise |
| 4b. Hip Thrust | -> | Lower body assistance exercise |
| 5a. Ab Wheel | -> | Isolation exercise (abdominals) |
| 5b. Back Extension | -> | Isolation exercise (erectors, glutes) |

There are other ways to structure exercises as well. For example, various advanced pre- and post-exhaustion techniques are often used in bodybuilding circles for hypertrophy-specific training. In this book, however, we will not be utilizing those special techniques.

Bottom Line

Train big, compound barbell exercises often.

Do the most important and/or most demanding exercises first.

Lift heavy.

Get more volume in with "assistance" exercises.

Do some pump work.

Go home.

CHAPTER 10: HOW MANY SETS?

Common sense would dictate to us that to get better at something (strength is a skill, remember?), you'd need to practice more of it. Whether it's playing the guitar, learning a new language or collecting rare stamps, the more time and effort you invest into mastering a task, the greater your ability to perform that specific task will become over time.

Nobody ever got better at something by doing *less* of it. Remember that.

As we've already discussed, training volume, intensity and frequency are all interdependent factors. Generally speaking, the lower your training intensity, the more volume you need in order to reap rewards and vice versa. Likewise, when frequency is high (i.e. daily training or multiple training sessions per day), intensity and volume can't remain high for long periods of time as this will compromise the body's ability to recover, leading to plateaued or even diminished strength levels and possibly overtraining.

Following along the previously established guidelines of training each muscle group 3x/week or 2x/week (beginners and intermediates, respectively), the question then arises:

"How many sets should I perform for a combination of strength and size?"

Single vs. Multiple Sets - The Ongoing Debate

Regarding training for strength and size, some people audaciously claim that one single set (often taken to the point of failure) is all that is needed for producing maximum strength and muscle gains.^{67,68,69,70,71} The vast body of evidence in the scientific literature does not support this notion.

In fact, in the light of current research on the whole single vs. multiple set discussion, multiple-set protocols are clearly in the lead.^{72,73,74,75}

Kramer and colleagues noted that multiple sets not performed to failure yield superior gains in 1RM squat strength compared to one set to failure in moderately trained subjects.⁷⁶

Rhea and others demonstrated that when intensity is kept equal, multiple sets produce greater strength gains in both the upper and lower body than one set in a periodized training program.⁷⁷

Wolfe et al. located and retrieved 16 studies conducted between 1962-2002 that addressed the single vs. multiple set discussion in resistance training. Their findings indicate that single-set programs result in similar strength gains as multiple-set programs for an initial short training period in *untrained* individuals. However, as progression occurs and higher gains are desired, **multiple-set programs are more effective for trained individuals**. Thus, for programs with an extended duration, multiple sets are superior to single sets for gaining strength.⁷⁸

Moreover, Krieger and colleagues found that **2 to 3 sets per exercise are associated with 46% greater strength gains than 1 set** in both trained and untrained subjects.⁷⁹

For muscle hypertrophy, 2-3 sets per exercise are more effective than 1 set (40% greater size gains with multiple vs. single set) in both trained and untrained subjects.⁸⁰

Now here's where things get really interesting... and I apologize in advance if your eyes are glazing over already. Feel free to come back to this part at a later time (or never).

According to the research papers by Krieger quoted above, there appears to be no significant difference between 2-3 sets per exercise and 4-6 sets per exercise in terms of strength gains, although there may be a corresponding increase in hypertrophy in relation to a higher number (≥ 4) of sets performed. However, whether 2-3 sets and 4-6 sets per exercise actually do produce different rates of hypertrophy was still inconclusive at the time the research papers were published, as the author of the papers also noted.

A more recent study did indeed find a difference. Researchers from Down Under compared the effect of 1, 4 and 8 sets of squats performed at 80% of 1RM twice a week on strength and

hypertrophy on trained individuals. What they found is that the high-volume protocol (8 sets) was superior to 1 and 4 sets both in terms of squatting strength and lean mass increases.⁸¹

After all of this massive theory-wanking, it's evident that multiple sets are more effective than single sets as clearly stated by research.

Or are they?

When you pore over the research papers, you'll quickly notice that the proponents of single-set protocols are able to rip apart pretty much any research paper that is pro multiple-set training, pointing out inconsistencies and flaws in study design. On the other hand, multiple-set advocates accuse the single-set crowd of misinterpreting the data on purpose. Just because a difference didn't reach statistical significance doesn't mean no meaningful effect was observed, which is often the case in this debate - a study demonstrates that multiple set protocols cause greater positive changes in strength and hypertrophy, but that difference is not "statistically significant" so the result is interpreted as proof for no difference between single and multiple set training programs.

Who's Right, Who's Wrong?

You could literally review the current research out there and all it would do is make your head hurt like the time Charlie Sheen woke up in a hospital following a what must have been a stupendously glorious night of binging on a briefcase full of cocaine off random strippers' backs.

Both sides of the single vs. multiple set debate present logical arguments (at least on the surface) and defend their stance with the tenacity of the Grove Street Families gearing up for a turf war with The Ballas somewhere in East Los Santos.

Here's where we stumble upon the limitations of research. Remember when I said earlier that you can use scientific studies to help back up or refute pretty much any point of view? Well, what we've got here is a bunch of inconclusive studies and it's not likely a consensus will be reached on the matter among scientists too busy swinging virtual dicks and shooting holes through the opposition's

claims any time soon. What we're left with is casting our views on the blatantly obvious empirical evidence, which is hardly inconclusive and too obvious to be ignored.

You'll be hard-pressed trying to find a world-class powerlifter, Olympic lifter or strongman who uses and excels on single-set routines.

The training programs and experiences of most strength/power athletes indicate that multiple sets produce superior results. Likewise, the vast majority of respectable strength & conditioning coaches favor multiple sets when designing programs for their clients.

Let's stop for a moment and think about the practical implications of the 1 set is enough theory. If - and this is a huge assumption - a single set of a given exercise was enough to maximize hypertrophy and strength gains, it would mean that the human body functioned in a switch on/switch off manner. You go to the gym, perform a moderately heavy set of squats, and you now have milked the potential gains to a full 100%, meaning that all subsequent sets will be useless.

Contrary to that point of view, proponents of the multiple-set theory state that gains are produced in a dose-response manner, which, at least for me, makes much more sense. The first set will have the biggest overall effect, yes, but the following sets will have an impact as well. Even though this effect is smaller (relatively speaking) for each and every set you perform for that same exercise (and at some point one additional set will cease to provide a desired effect), they still do yield an effect that should not be neglected.

“ The dose-response is a training principle that states that a given stress or dose will result in a certain response with higher doses eliciting a greater response up to a certain point. After this point of maximal effectiveness, benefits of increased dosages begin to diminish and an overdose is observed.

In the pharmaceutical world, the principle of the dose-response is a very familiar and important concept. Physicians must know the degree of impact that a specific dose of a drug will have in order to prescribe the correct amount. Too little dose will fail to achieve the needed change in health or condition while an overdose may carry severe adverse effects. Similar to pharmaceutical drug prescriptions, exercise professionals prescribe resistance training programs

(of varying doses) to elicit the needed or desired degree of strength development. Prescribing too little work will result in a failure to achieve the desired or needed strength gains while too much work could result in overtraining.

The principle of progression states that once an individual has become accustomed to a stimulus, they must add additional stress in order to stimulate continued responses. In other words, the dose must be progressively increased to result in continued adaptation. These principles have been developed through years of research and practice and have continually been supported by such work. 🏃‍♂️⁸²

Is There an Optimal Volume for Strength and Hypertrophy?

Short answer: no.

Volume is a highly individual thing. Some people thrive on high volume, whereas others can and do see great gains with only one or two work sets.

How someone responds to a high-volume training plan depends on multiple factors such as age, training age, injury history, ability to recover, external stressors in life, etc. Another thing we need to take into account is that you can't increase volume forever. If 8 sets of squats is better than 4 sets, then surely 16 would be even better? And when 16 sets cease to produce further gains (as all training protocols at some point will) why not go up to 32 sets? Or 100?

Once again, we can merely establish guidelines and go from there...

Peterson and colleagues summarized their findings in the following manner:

- **For untrained individuals**, maximal strength gains are elicited at an average training intensity of 60% of 1RM, 3 days per week, and with an average training volume of 4 sets per muscle group.
- **Recreationally trained non-athletes** exhibit maximal strength gains with an average training intensity of 80% of 1RM, 2 days per week, and an average volume of 4 sets per muscle group.

• **For advanced athletic populations**, maximal strength gains are seen at an average training intensity of 85% of 1RM, 2 days per week, and with an average training volume of 8 sets per muscle group (16 total sets per week per muscle group).⁸³

A study by Wernbom et al. established similar specifications, suggesting that hypertrophy in novice to intermediate lifters can be maximized with up to 3-6 sets per muscle group, performed 2-3 times per week (6-18 total sets per week per muscle group). The researchers also noted that advanced lifters probably need even higher volumes to elicit further gains in size.⁵⁶

Bottom Line

Can you gain muscle by performing only a single set of a given exercise?

Yes.

Can you build strength with a single-set training program?

Absolutely, as long as the principle of progressive overloading is adhered to.

For people interested in general fitness and/or lacking in time, motivation or intestinal fortitude to undergo a more rigorous training plan, a single set is suitable.

Three sets per exercise is an appropriate starting point for someone looking for maximal strength and muscle gains. Adjustments can and should be made from these starting points based on how a trainee responds to a given training protocol.⁸⁴ In other words, let your progress or lack of it guide you with training-related decisions; only make changes when what you're doing no longer works.

In practice, **the sweet spot for optimal strength and hypertrophy both from a results-oriented and time management standpoint appears to lie somewhere between 2-6 sets per exercise per training session**, and a minimum of 2-3 sets per exercise is required to elicit significant gains. Advanced athletic trainees generally need to perform more volume than beginner or intermediate lifters to cause additional training adaptations.

CHAPTER 11: HOW MANY REPS?

Ever since the first barbell was hoisted in the air 100-something years ago, people have been engaging in heated arguments about which rep range is best suited for building muscle and strength.

Although I reckon that those debates at the turn of the 20th century weren't anywhere as heated as they are these days on various fitness message boards where LegCurlLarry and BicepsBob123 verbally demolish their opponents via the powerful clickety-clack of their keyboards, "How many reps should I perform?" is still one of the premier questions a healthy male will ask a fellow trainee inside gym walls in the Western world along with "Whaddaya bench?" and "Dude, where's my car?"



Err, I'm not so sure about that last one, though.

Undoubtedly you have heard the old maxim that low reps only build strength, high reps are great for losing fat and enhancing muscle tone (which is BS), and that the growth zone is 8-12 reps (that's why you always see 3x10 as the most usual set and rep combination in training programs in the magazines).

An estimated ~ 25% of the hypertrophic response in human skeletal muscle following resistance training is determined by the loading.

As such, loading is one of the most (if not *the* most) important factors when designing strength training programs, both if the prime goal is increased muscle mass or if it's gaining strength with as little increase in muscle mass as possible, the latter being a viable training objective for many athletes competing in sports involving weight classes, such as boxers, wrestlers or weightlifters.⁸⁵

That said, let's consult the repetition maximum continuum for answers in light of our training goals - increased strength, power and muscular size.

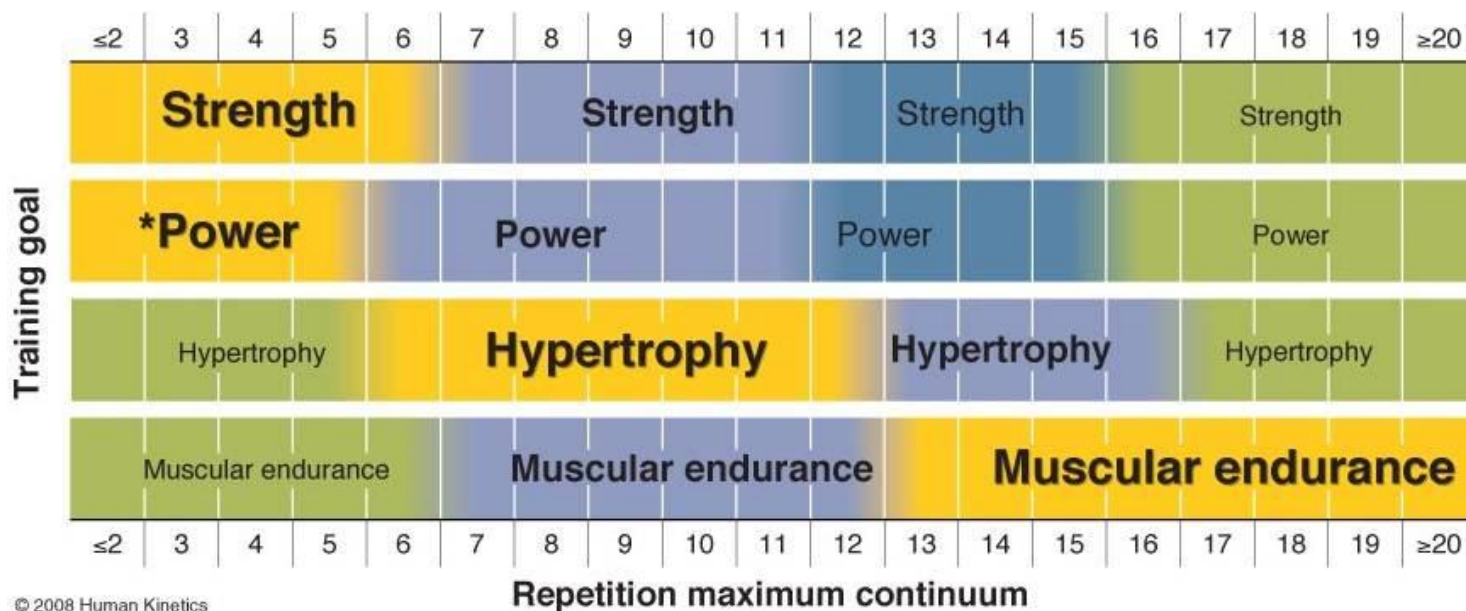


Figure 4. This continuum shows how RM ranges are associated with various training goals.⁸⁶

As far as the number of reps per set for optimal hypertrophy is concerned, biggest gains will typically occur when performing 6-12 reps on a given exercise (yellow area in the picture above).

Scientific evidence appears to support this notion. While still far from 100% conclusive, current research indicates that training with loads at 70-85% of 1RM (approximately 6-12 reps per set) is best for maximizing muscle growth.⁵⁶

Furthermore, when observing the repetition continuum, it becomes evident that performing lower reps (1-5) emphasizes more strength than hypertrophy gains. And before you quip in with how Olympic weightlifters only perform low reps and still get jacked, realize that their training frequency and volume far exceeds those of the typical gym rat... not to mention the pharmaceutical assistance many pro level athletes nowadays receive.

The Bulgarians, for instance, trained every day of the week, often several times per day (with up to 15 training sessions per week) under the watchful eye of head coach Ivan Abadjiev.⁸⁷

If you're a guy with no regular working hours, don't experience much stress in life, have the time and energy to devote hours every day to lifting weights, and have spent several months or years working up to and getting accustomed to a high-volume, high-frequency training stimulus, that type of training can be very effective for adding weight to the bar and size to your frame. But understand that most people have lives outside of the gym and possess no inclination to ever training like a full-time weightlifter.

On the other hand, higher reps (12+) focus more on muscular endurance, somewhat on hypertrophy and less on strength, although there's a time and place for them as well (which I will address in a minute).

All in all, 5-12 reps per set seems to hit the sweet spot for both strength and size gains.

And I would even go a step further, claiming that 5-8 reps is where the magic happens for the drug-free, genetically average guy (at least in the beginning).

There are two reasons for this.

1. A beginner needs a large amount of repetitions to learn correct technique and timing with the big barbell lifts. The rule of 10 000 states that in order to achieve a high level of proficiency, you need to get 10 000 repetitions with a given lift under your belt.

Good reps, that is. Shitty ones don't count.

But the real caveat lies in the fact that those 10 000 reps need to be in the correct rep range (for the most part). There's a difference between doing sets of 5 and sets of 15. While performing sets of 15 reps will undoubtedly allow you to reach 10 000 reps faster than sets of 5, I don't recommend going above 10-12 reps when you're first starting out. With lower body lifts such as squats and deadlifts, I never have my clients go above 8 reps in the beginning.

I can see you shaking your head right now while reading that line above. The fitness magazines you have been perusing clearly state that beginners should keep their reps at the higher end of the continuum for fear of injury. Undoubtedly you've heard personal trainers at your local big box gym parroting this same stuff as well.

It's a good thing you brought it up because it's yet another myth which we better dispose of right now.

Look, what many of these so-called experts have failed to comprehend is that doing a set of 5 reps (or any low rep set) does NOT mean it's by default a slow, grinding max effort set that snaps your spine in half.

According to Siff, loads as small as 40% of 1RM can significantly enhance the strength of a beginner (but have no strengthening effect on an elite athlete).⁸⁸

Furthermore, according to Rhea et al., 60% of 1RM is the optimum amount to be used to spur strength gains in a novice (those with less than 1 year of consistent training).⁵⁷ Even though I don't completely agree with that notion (in my opinion, slightly higher intensities work better for most people I design and have designed programs for past the raw newbie stage), these findings demonstrate that **a beginner doesn't need to use extremely heavy weights to elicit a training response and gain strength.**

While the idea of higher reps for beginners appears good in theory, what really happens when a novice performs, say, 12+ reps (even with light weights) on a compound barbell exercise like the squat, is that their smaller and weaker stabilizer muscles (abs, lower back) give out before the stronger muscles of the legs (quads, glutes, hamstrings). His form starts crumbling due to big relative strength imbalances between muscle groups so that he'll try to complete the lifts by

overcompensating with the aid of stronger muscle groups when the weaker muscles are too tired to maintain solid technique any longer.

This is why you often see a newbie turn a set of proper back squats into good mornings when fatigue sets in towards the end of a high(er) rep set. Or in the case of deadlifts, the lower back starts rounding a bit more on every subsequent repetition. Or they start bouncing the bar off the chest on the bench press. All this does is teach the trainee bad habits and increase the risk of injury.

According to Berger, practicing while fatigued not only reduces the quality of performance but also negatively affects the learning of relatively complex total body movements.⁸⁹ So not only do we compromise form in the short term but also ingrain false movement patterns that we'll need to fix later down the line.

Whammy!

As a parallel example from the world of track & field, the late, great sprint coach Charlie Francis never hesitated to end a training session abruptly if a trainee started compromising on his form during neurally demanding speed work.⁹⁰ Letting him continue would have meant ingraining false movement patterns that would eventually increase the risk of injury and lead to poor performance in competition.

Does this mean you should never train under fatigue?

Surely not. That would run counter to any real-life situation that you would face in basketball, hockey, tennis or any other type of sport that has an anaerobic component to it.

Eventually, when good form has become second nature, we can and should utilize higher-rep sets in our training, for example 20RM squats. But in the beginning we want to lay a foundation for proper learning and solid execution of the basic exercises. And we do that by keeping the loads fairly low and reps low to moderate.

Starting light allows us to master technique quickly while being able to continuously add weight to the bar without fear of injury or hitting a wall in three weeks.

It's not uncommon for clients - especially if they're female or otherwise on the weaker side - to begin with just the barbell weighing a whopping 20 kilograms, perfecting their technique with low to moderate reps while simultaneously adding 2,5-5 kg per session to the bar, and continuously getting stronger. Eventually, three to six months down the line, they will have surpassed in strength levels many gym rats who still perform strictly high reps.

2. As we have already established, progressive overloading is the name of the game. You will be hard-pressed to find a guy who looks strong but trains with puny weights (barring an injury).

You need to surpass the numbers written in your training journal if you ever expect to get anywhere with your training. It's much easier to beat your previous records from week to week with low to moderate reps (5-8) than it is with 10, 15 or 20 reps per set.

As an anecdote (yes, this is purely anecdotal, shoot me), it's also how I added over 100 kg to my deadlift within the first 12 months of practicing the lift. I simply pulled in the 5-8 rep range with different stances (conventional, sumo) and at a different height (off the floor, off pins/blocks), and tried to beat my training journal every time I stepped inside the gym.

Had I listened to what the "experts" were saying about sticking to higher reps, I doubt I would have progressed as fast.

If it worked for me, it'll work for you.

Now, once you get proficient at the barbell lifts and become more experienced, training at lower intensities will no longer cut it. While beginners can improve their strength using virtually any type of resistance training involving loads greater than 40% of 1RM, continued strength gains require further increases in training load to 70% of 1RM and above (all the way to 90-100% in more advanced lifters).⁹¹

Bottom Line

To me this whole debate about low reps vs. high reps is silly.

You should get stronger in all rep ranges that are conducive to your training goals.

Since you still haven't put this book down, I know you want to gain strength and muscle. Your training should reflect that. So we won't be programming 100 rep bench press sets into our workouts.

What we will do is train across the entire repetition spectrum - 1-20 reps. Main lifts are generally performed in the 1-8 rep range, with Olympic lifts in the 1-5 rep range. Assistance exercises typically run between 6-15 reps per set for the upper and 8-20 reps per set for the lower body.

However, there's no rule stating that you can never go higher than that. Especially on certain lower body lifts - such as squats, hack squats or leg presses - 20+ reps can spur greater hypertrophy if you've reached a plateau in training. But I would refrain from very high reps until you can be considered a somewhat strong guy. And by "strong guy", I mean when people in your gym will literally stop what they're doing and stare at you while lifting. For the record, squatting two plates is not strong (unless you're a 50 kg female).

Why don't I recommend high reps for novices?

First of all, you need to master perfect technique so that you don't crumble under the tremendous fatigue you'll be experiencing with high reps. Second, with a 1RM of 60 kg on the squat, your wheels won't be growing too much with 20 rep squats performed with just the bar in comparison to having added 100 kg to your squat 1RM a year or two down the line. So save the high reps for the time in your training career when you actually do get something out of them.

When you're first starting out, drop the ego, start light and keep the volume and intensity moderate. Beginners don't need to perform ball-busting training sessions with high volume and intensity to witness strength increases. Focus on learning proper lifting form and try to add weight to the bar as often as possible.

Past the novice stage (~ 1-2 years of progressive strength training), the following guidelines apply:

- Lower volumes (1–3 sets) and intensities (50–70% 1RM) cause minimal strength improvements among experienced athletes.⁹²
- For athletes with more than one year of strength training experience, the intensity of 80% of 1RM is close to optimal.^{57,93}
- Generally, if gaining strength is your main objective in the gym, most of your work sets should be done in the 70-85% of 1RM range, which amounts to approximately 6-12 reps per set.

Combine that with lifting loads above 85% of 1RM (1-5 reps per set) every now and then, and you've got your bases covered. Occasionally performing low reps is great for producing additional strength gains primarily via neural adaptations, and should not be completely neglected as a training tool.

- If you're more after hypertrophy, the traditional "bodybuilding" approach of higher volume, moderate intensity at 60-80% with multiple sets and multiple exercises per body part is very effective.^{94,95}

Although even then, you shouldn't neglect "strength work" at slightly higher intensities because increasing your strength also raises your potential for muscle gains. You'll often hear guys say "I don't care about being strong, I simply want to build muscle" but this is simply limited thinking.

Let's say we had an intermediate guy squatting 140 kg for 3 reps. If he spent some time focusing on pushing up his low-rep maxes and ended up squatting 180 kg for those same 3 reps, would he not have bigger legs even though 3 reps is not considered to be in the "growth zone"?

Still not convinced?

Well, what about taking his newly-gained strength on low reps and transferring it back to higher reps? Whereas previously he was able to do 15 reps with 100 kg, he's now performing 15 reps with 130 kg. Surely this increase in performance will elicit a noticeable hypertrophic response.

- Regarding **total reps per muscle group per workout**, greater gains in muscle mass are noted initially with increasing volume (or duration) of work, but with diminishing returns as the volume increases further. Overall, moderate volumes (~ 30–60 repetitions per muscle group per session) appear to yield the largest responses.⁵⁶

CHAPTER 12: WHAT ABOUT REST PERIODS?

A typical gym rat will rarely ponder about the time interval that's lapsing between his working sets, which, to tell you the truth, doesn't really surprise me at all.

Why?

Because he has no goals!

Well, apart from benching a ton of weight, telling his buddies about all the tail he was getting at a house party last weekend, and ogling fit babes while they're squatting, that is...

Consequently, rest periods drag on for as little or as long as it takes him to read an article in the latest issue of Men's Health that somebody left in front of the pec deck machine. Though, whenever the Swimsuit Issue of Sports Illustrated is lying around, rest periods magically increase by ca. a tenfold in duration...

All kidding aside, my point is that resting too short or too long will negatively affect your results. But how do you know how long you should be resting?

Your rest periods depend entirely on your training related goals.

And since you're still reading this book, I'm willing to bet my legs, my arms and my entire hockey fight tape collection that your goal is to build strength and gain muscle.

The amount of rest between sets is strongly related to the intensity (% of 1RM) of the exercise. The higher the intensity and the heavier the loads lifted, the longer the rest periods between sets need to be to allow for sufficient recuperation. Furthermore, the more muscle groups a given exercise is simultaneously targeting, the longer the rest interval required.

Hence, a heavy squat for a triple is much more demanding than a 12-rep set of dumbbell curls, and requires a longer rest interval to recover from.

When training for maximum strength, longer rest periods (≥ 3 minutes) are generally more effective than shorter ones (30-120 seconds), since it takes the body about three minutes to fully regain your strength on a given exercise.^{96,97,98,99,100}

Then again, anyone who has ever performed a brutal 20RM set of breathing squats will tell you that after three minutes you're slowly beginning to scrape yourself off the floor and maybe, just *maybe* are capable of standing up without your legs turning into cooked noodles... Even the thought of another set has you reaching quickly for a bucket to puke into.

In accordance to the previous point about strength being regained after approximately three minutes, longer rest periods also allow a lifter to perform a higher volume of training with a given load than do 1- or 2-minute rest intervals, which appears to be important in stimulating greater strength and hypertrophy adaptations.^{101,102,103,104}

Based on that information, wouldn't it make sense to, I dunno, rest for 10 minutes between sets? Surely that'll spur even greater gains..?

The practical aspects of longer rest intervals (> 5 minutes) must also be considered, since you don't want to drag your workouts for too long. Besides, there is definitely a point of diminishing returns when it comes to extending rest periods, where a longer rest interval yields no additional volume or strength gains. Although that specific point has yet to be exactly determined, suffice it to say that you will rarely - if ever - need to rest longer than 5 minutes between sets.

Regarding hypertrophy, metabolic stress and achieving a huge pump seem to be pretty important.^{105,106,107} In contrast to exercises that involve larger muscle groups, which are generally suited for hoisting big weights and require relatively long rest periods, isolation movements are usually intended for moving lighter weights for higher reps, keeping rest periods relatively short, and getting the biggest pump possible in the intended muscle(s).

This seems to fall in line with scientific research as well, which indicates that moderate rest periods of 30-120 seconds produce the best results regarding hypertrophy.^{100,108,109}

When constructing a productive strength training program, it makes sense to rest longer on basic multi-joint exercises that hit the biggest muscle groups and are physiologically the most demanding to perform and recover from.

For submaximal lifts (less than 90% of 1RM), 3–5 minutes rest should be prescribed between sets to allow for consistency in repetitions without large reductions in training intensity^{110,111}, whereas 0.5 to 2 minutes are optimal for accessory work from a muscle-building standpoint.

Bottom Line

When trying to combine the best of both worlds in terms of strength and muscle gain, we want to allot longer rest intervals for the heavy barbell lifts (squat, bench, etc). With assistance work, in general, rest periods should be kept short. You're not supposed to be doing pulldowns, DB rows, curls, flyes, etc. with very heavy weights or low reps, so there's no need to drag breaks between sets.

Most of the time you're best served keeping rest periods on assistance work to 45-60 seconds for the upper body, especially if you're super-setting two or more exercises after one other.

Training legs is more demanding than training the upper body, so you may want to bump the rest interval up to 90-120 seconds on lower body assistance exercises.

CHAPTER 13: TO FAIL OR NOT TO FAIL? THAT IS THE QUESTION



“Stimulate, don't annihilate. Treat training like practice, as Arthur Saxon advised over 100 years ago. Work hard but don't kill yourself. You'll see better long term progress that way.”

—Jason Ferruggia

If there is one topic that gets people in the fitness community hot under the collar, is the age old "training vs. not training to failure" adage.

Can you gain strength and size without ever taking a set to failure? Absolutely.

Powerlifters and weightlifters rarely train to failure, yet possess impressive levels of strength and muscular body weight. For example, powerlifting legend Ed Coan reportedly never missed a rep in training, always saving his best lifts for the platform.

Do you see powerlifters and weightlifters miss reps in training? Sure. But understand that what they do is truly sport-specific training since they're judged on competition day based on the amount of weight they can hoist for one single rep, and they never fail a lift in practice just for failing's sake.

Male gymnasts also never train to failure on purpose. Intentionally failing in the middle of an iron cross hold or a handstand on the rings would beat the whole purpose of the sport, which grades

athletes based on degree of difficulty of movements, fluency in executing their routines and overall presentation skills.

They may be tiny in comparison to heavyweight barbell athletes, but one look at the upper body development of Yuri van Gelder or Brandon Wynn is enough to help you comprehend why I'm a huge fan of advanced bodyweight movements (which is to say those guys are jacked, Jack!).

Then again, training to failure is a staple in bodybuilding circles, and bodybuilders generally carry more muscle mass (but not necessarily equal amounts of strength) than power- or weightlifters.

Before we attempt to ascertain whether training to failure is a viable tactic and who would benefit from it, let's shortly define the concept of "training to failure".

'Failure'

Concentric failure is the point in a set where a full repetition cannot be completed during the concentric (positive, or muscle-shortening) phase of the rep without assistance from outside means (such as cheating or assistance from a training partner).¹¹²

Simply put, if you get stapled by the barbell on the last rep during a 10-rep-set of bench presses and need the hand of a spotter to help rack the bar, that last (10th) rep is the point when you've reached concentric failure.

Two other subtypes of failure training exist as well, namely *isometric* and *eccentric failure*. We will not delve deeper into those two subtypes in this chapter, since they play only a minor role in training for strength and hypertrophy.

'Clean Failure' and 'Leaving a Rep in the Tank'

Keeping the previous bench press example in mind, if you stopped the set after rep number 9, that would constitute "clean failure" or "technical failure". In other words, it would not have been possible to perform even one more extra repetition with good form on your own after the ninth rep.

Likewise, stopping the set at rep number 8 or 7 would be described as leaving a rep or two (respectively) in the tank.

If you're wondering where I'm going with this, just keep on reading. I promise it will all make sense in a minute.

Practical Applications

The very first thing we need to look at before devising a training program is the individual's goals, training status and previous experience. For a novice, the immediate goal is to ingrain proper form on the basic barbell exercises, and thus training to failure is not an important concept.

As we already discussed in Chapter 11, loads should be kept light in the beginning to establish solid movement patterns and habits. Taking sloppy form to fatigue encourages bad lifting habits and increases the risk of injury. Only when good form can be maintained at high intensities, should training to failure be considered as a viable method to spice up one's training.

One thing I need to address for further clarification is that once good technique has been learned, you need to go to failure sooner or later if for no other reason than to understand what happens when muscular fatigue prevents you from completing a set on your own (just make sure you get a reliable spotter when you do this).

If you've never experienced what true failure feels like, how can you learn how to stop a set just shy of it? Well, you can't. So, if they've never trained to failure before, and I tell someone to train to

"clean failure" or "leave a rep or two in the tank", how are they supposed to pile on enough weight on the bar and still finish the set at the correct point?

For all I know, they could be coasting through the workout for fear of straining themselves, stopping five reps shy of failure, which would make me very, very mad.

Not training to failure is not a recommendation to train like a pussy.

Capische? (In my best Tony Soprano voice)

Good.

Should you train to failure past the newbie stage?

Again, this depends on your goals.

Stone and others argue that *training intensity* is much more important in inducing a training effect for strength and power gains (sound familiar?), especially in experienced trainees, than training to failure.¹¹³

Izquierdo and colleagues demonstrated that **not training to failure was more beneficial for power production, whereas both training and not training to failure resulted in similar improvements in maximal strength.** However, training leading to repetition failure seemed more beneficial for enhancing upper body local muscular endurance.¹¹⁴ This notion supports anecdotal bodybuilder evidence that taking a set to failure is advantageous for maximal hypertrophy, since more reps performed at a given % of 1RM in a hypertrophy rep range lead to better muscle gains.

As stated by a review of current research by Peterson and co-workers, **training to failure does not elicit greater strength gains than not training to failure.** This is true even when comparing protocols that utilize multiple sets taken to failure vs. multiple sets not to failure.⁸³

According to another study conducted on advanced athletes, it appears that training to failure on a constant basis (i.e. frequently taking all or a majority of working sets to failure) is not as conducive for building strength and power as cutting the set before failure is reached.¹¹⁵

So, in essence, if your main goal is strength and power, training to failure is not necessary or even recommended on heavy compound movements. Especially for power production it's downright detrimental, since practicing an explosive lift such as a power clean or dumbbell snatch in a fatigued state will lead to breakdowns in technique and decreased power production.

Should you want to focus your training efforts more on muscle growth, training to failure can be an effective training technique to spur more hypertrophy. Because muscular hypertrophy is a major contributor to long-term increases in maximal strength, advanced lifters should consider training to failure occasionally.¹¹⁶

For this purpose, it is suggested that reaching failure might be prescribed only on the last set of a given exercise or series of exercises that address similar muscle groups or movement patterns.^{117,118}

What about forced reps, then?

Drinkwater and colleagues discovered that for moderately trained athletes, there is no additional benefit to strength or power development when training repeated sets of forced repetitions compared with ceasing training sets once the point of repetition failure has been reached, even when higher volumes of both successful and failed repetitions are completed.¹¹⁹

This means that **once concentric failure has been reached, forced or partner-assisted reps don't produce any additional strength or power gains.**

Are there any limitations to failure training?

One thing we need to stress over and over again regarding training to failure is that it places a heavier burden on the nervous system and is harder to recover from. Constantly grinding out reps at near-maximal intensities really takes a toll on the body by overtaxing your neuromuscular system and overstressing your joints.⁶⁰

Therefore, when utilizing heavy, multi-joint barbell lifts that target large muscle groups (squats, bench presses, and so on), and training for maximal strength, failure training should be avoided for the most part, since it's very exhausting for the nervous and hormonal system, so that recovery from it takes longer and overreaching/overtraining is more likely to occur.

Furthermore, training to failure should not be practiced repeatedly over long periods due to the potential for decreases in growth-promoting hormones and increases in overuse injuries.¹²⁰ **The over-prescription of failure sets may result in decreased resting levels of testosterone and increased resting levels of cortisol, which are counterproductive to hypertrophy.**¹¹⁷

Another thing we need to keep in mind is the effect of failure training on your athletic capabilities if you actively participate in a sport (i.e. play hoops, flag football or soccer a few times every week). When you regularly tax the muscles and nervous system via training to failure, your performance on the field is likely to suffer due to your body's limited capacity to recover from strenuous exercise.

Lifting weights 3-4x/week while training to failure and playing your sport another 3+ times per week on top of that places a tremendous amount of stress on the entire nervous system. As a result, this could potentially lead to a plateau or even decrease in strength levels, and rarely feeling "fresh" in the gym or on the field.

Finally, training to failure is not recommended when training skill-based exercises or exercises that could potentially put you in a dangerous position, such as handstand push-ups. Letting gravity do its thing and landing on your forehead or neck while you're standing upside down on your hands is not a very smart pastime, as far as I'm concerned. Luckily, nature has a tendency to weed out idiots who engage in such activities from the gene pool for good...

The jury is still out there as to what is the most optimal way to implement failure training to a well-rounded strength training regimen. Everybody has got their own opinions and biases on this subject. Nevertheless, I believe this chart below sums things up rather nicely.

	STRENGTH TRAINING	MUSCLE HYPERTROPHY	MUSCLE POWER	LOCAL MUSCULAR ENDURANCE	MOTOR PERFORMANCE	OLDER ADULTS
NOVICE	Do not apply	Do not apply	Do not apply	Do not apply	Do not apply	Do not apply
INTERMEDIATE	Do not apply	Ability to use as a stimulus different (<3 weeks)	Do not apply	Possibility to apply included in the planning	Do not apply	Do not apply
ADVANCED	Apply if there is plateau (≤ 7 weeks) and different stimuli.	Apply if there is plateau (≤ 7 weeks) and different stimuli.	Do not apply	Possibility to apply (≤ 7 weeks) included in the planning	Do not apply	Do not apply

Figure 5. *Inclusion to muscular failure at the various stages of training status according to the ACSM.*¹¹⁸

Bottom Line

Note: These guidelines apply only to non-beginners, meaning that you are able to perform the basic lifts with picture-perfect form. Raw beginners should not train to failure on purpose!

- Training Goal: Power

Stay far away from failure. Bar speed should always be fast and technique spot-on when training for power and explosiveness.

- Training Goal: Strength

Push it hard and train to "clean failure" most of the time. You stop your set right before your form starts breaking down or before you start grinding those slow, ugly death-set reps that take you 5 seconds to complete. You also need to hold it back at times (when starting a new training cycle, coming back after a longer layoff or feeling burnt out) and leave a rep or two in the tank.

- Training Goal: Hypertrophy

Train to "clean failure" on heavy strength exercises with free weights. On isolation exercises that target smaller muscle groups (curls, lateral raises, flyes, pushdowns, etc.) you can and probably should train to concentric failure every now and then to maximize the body's hypertrophic response.

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NEXT LEVEL

**STRENGTH
TRAINING**

PART III:
THE TRAINING PROGRAMS

“ Programming for the novice is the most important task a coach will encounter, and the most important task an athlete can undertake. Done correctly, it sets the stage for a lifetime of proper training habits, long-term progress, and athletic achievement far above what would be possible without it. Insufficient attention to detail, and to the trainee's response to training during this phase, can cost valuable progress that may not be recoverable later.

In one very important respect training novices is easy: virtually anything that makes a novice work harder than bed rest will produce positive results. As a result, many people have an erroneous impression of the quality of their training system. Single sets, multiple sets, high volume, high intensity, super slow, supersets, giant sets, gnarlmonster sets - quite literally anything resembling a training program of this simple fact has produced profound confusion among both academics and coaches in the strength and conditioning profession, with many coaches believing that research conducted on untrained eighteen-year-old males is relevant to all population, including athletes.”

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I have noticed that the program design skills of personal trainers/fitness coaches are often severely lacking, which isn't really that big of a surprise considering that many get their workout ideas from Men's Health.

I've seen numerous workout programs written in various publications, both online and in print, and can honestly say that 90% of them are not even worth the paper they've been printed on. The reason for this lack of program designing skill is first and foremost a lack of knowledge and understanding of the scientific principles that govern human physiology and performance. Not to mention how many of these people base their exercise recommendations on what they see working in novice trainees.

Newsflash: *everything* works for a beginner.

While I was working on this book a favorite pastime of mine was visiting a nearby bookstore and exploring the fitness/training section to see what the general public reads. I found a wide range of manuals on how you should train, some of them written by researchers and doctors, others by fitness trainers and physique competitors. One book's marketing tag line was that a total of 12 minutes of training per week is enough to provide a significant training stimulus and the authors

claimed to back this up by science. Well, I've plowed through the research out there and nowhere did I find support for this or the many other questionable statements made in these publications.

One thing nearly all of these mainstream training books had in common was that there was very little reasoning behind the workouts and how to have the trainee gradually progress through various stages over a longer time frame as he adapts to the current training stimulus and as his strength levels increase. Their recommendations seemed lumped together out of random bits and pieces, just like the undeniably fashionable carved wooden pencil box I had assembled in arts and crafts class and gave my Dad as a birthday gift when I was in second grade.

It's a one-size-fits-all approach to training based on individual opinion, hearsay and pseudoscience, but what you seldom learn from these books is how to modify exercise variables to support your training goals.

See, all that theory-wanking we went through in Part II did have a purpose!

Now, it's time to spin theory into a proven, practical training program.

First things first. It's very difficult to give specific recommendations for all types of trainees when the specific stats - age, training experience, current strength levels, injury history, and so forth - of an individual are not known.

Second, the following programs were not created by Soviet researchers in a top secret performance lab for the Spetsnaz. Nor do they use elaborate supplement protocols and nutrient timing to harness the body's anabolic signaling. And if you fall for such marketing crap... well, shame on you.

What I will guarantee, though, is that these programs work. And having read this far, you'll understand *why* they work, which certainly is much more valuable than any training plan on its own. Accordingly, what follows are merely examples that serve as a starting point to help you develop your own programs which meet your own training needs as you get more advanced.

PHASE 1

“ Novice trainees, by definition, have little or no weight training experience. Having been a member of a health spa, using the machines at the Y, or curling with the plastic-coated weights in the garage doesn't count.

Novices lack the motor skills to perform the basic barbell exercises that form the core of the program, and they must learn proper and safe exercise execution. The novice is also unexposed to systemic exercise stress and has not developed the ability to respond to the demands of exercises that cause whole-body adaptation. Since the trainee is both inefficient and unadapted, only a few basic exercises should be used and they should be repeated frequently to establish the basic motor pathways and basic strength.

The squat, deadlift, press and bench press should be learned first, with the power clean and the power snatch introduced as skill and ability permit. These core strength and power exercises develop the foundation of strength, flexibility, and motor control that will allow for the later inclusion of more demanding exercises, because they utilize all the muscle in the same coordinated fashion that more advanced exercises do. ”¹²²

Many guys will think that they are advanced when they have been going to the gym for a few years. However, this rarely has any relation to how advanced they are when it comes to the basic lifts.

It's not so much the years spent inside a gym but *what you've been doing while in there* that counts.

The harsh truth is that these guys often have neglected their legs while heavily emphasizing the "show muscles" (chest, abs & bi's, anyone?) in training, and can't even squat 100 kg.

After all, hot chicks dig abs and a pumped chest, you dig hot chicks, and your legs are hidden under a table while you're pulling your moves on her in a nightclub, so why bother training them, anyway? As the cool cats in the streets say: "Gotta keep it fresh, yo!"

A more commonly used way of classifying one's training status is how strong he is on the basic barbell lifts (squat, bench press, deadlift, military press), indicated as strength-to-bodyweight ratio.

A fairly common reference goal for males to be considered athletic is to have a 2.5xBW deadlift, a 2xBW squat, a 1.5xBW bench and a 1xBW military press. While nowhere near the strength levels of world-class athletes, reaching those numbers will put you in the top 10% among all trainees at your local big box gym.

However, the problem with giving an arbitrary number in relation to bodyweight is that someone with great talent and leverages will completely skew the calculations. Andy Bolton, the first man to deadlift over 1000 pounds, reportedly pulled 600 pounds the first time he practiced the lift. Does the fact that he lifted more weight on his first try than most people ever will make him less of a beginner? Surely not.

For all intents and purposes, my definition of a "beginner" is someone who still has the potential to gain strength rapidly through a linear progression model. Generally, you'd belong to this group if you had less than 6 months of steady, progressive strength training under your belt.

You could have been going to the gym for a decade, toying around with foo-foo exercises, trying every fancy training method or exercise under the sun, not having gained an iota of strength in five years, and still be outlifted by someone who has been going at it for a year if you had done things all wrong... like the majority of people at commercial gyms.

That's not advanced.

That's stupid.

But the good news is that even a strong case of ignorance can be cured.

In fact, it's not uncommon to have a guy (or girl) who has been led astray by hyped up marketing messages promising a quick fix start with a linear progression model, focusing on adding more weight to the bar as often as possible, and 3 months down the line they've blasted through and beyond their previous PR's. Such is the power of utilizing a basic, proven strength training program.

Sets Across vs. Ramping Sets vs. Back-Off Sets

Sets across means that you keep the same weight for every work set.

An example of the sets across approach is...

Set 1 - 90 kg x 5

Set 2 - 90 kg x 5

Set 3 - 90 kg x 5

Set 4 - 90 kg x 5

You'll notice that the first and second set are relatively light, whereas the last set is likely to be very demanding due to the accumulated fatigue over the previous sets despite no changes in weight on the bar. Once you've completed all sets for the required amount of reps, that's your cue to increase resistance for the next workout session.

With ramping sets you increase resistance for every set, which could look like this...

Set 1 - 70 kg x 5

Set 2 - 80 kg x 5

Set 3 - 90 kg x 5

Set 4 - 100 kg x 5

The last set is the toughest, while sets leading up to it range from fairly easy (set 1) to challenging (set 3). You increase resistance, when you can perform the last set for the prescribed amount of reps.

Back-off sets involve one top set followed by one or more sets at slightly lower intensities.

An example of back-off sets could be...

Set 1 - 100 kg x 5

Set 2 - 95 kg x 5

Set 3 - 90 kg x 5

Here the first set is the toughest, although the following back-off sets will also be hard as a result of the fatigue accumulated over the previous sets. Increase resistance when you can perform the first set for the prescribed amount of reps.

Out of the three approaches, I prefer the sets across method for rank novices who require plenty of reps with correct technique but not necessarily at a very high intensity, as established in Chapter 11. The sets across method builds the basis for the training program in Phase 1.

After a while, multiple sets across become obsolete for further strength gains on the basic barbell exercises. At that point, I favor one top set followed by a few back-off sets (as depicted in Phase 2 and later phases of the training program).

Day 1	Sets & Reps	Rest (sec.)
1) Squat	4 x 5	180
2) Bench Press	4 x 5	120
3a) Chin-Up	3 x 8-10	90
3b) Dip	3 x 8-12	90
4a) DB Curl	3 x 10-12	60
4b) DB French Press	3 x 10-12	60
Day 2		
1) Rack Deadlift	4 x 5	180
2) Military Press	4 x 5	120
3) Squat	4 x 5	180
4a) Ab Wheel	3 x 8-12	60
4b) 45° Back Extension	3 x 10-12	60
Day 3		
1) Squat	4 x 5	180
2) Bench Press	4 x 5	120
3a) Chin-Up	3 x 6-8	90
3b) Push-Up	3 x 8-12	90
4a) Cable Curl	3 x 10-12	60
4b) Cable Pushdown	3 x 10-12	60

Instructions - Phase 1

“ For the novice, the law is: learn first, and then load. There will be plenty of time to put weight on the bar later; the first task is to learn the movement pattern without having to worry about how heavy it is. *Heavy* always competes with *correct*, and at this point *correct* is more important. ”¹²³

- Train three days per week on non-consecutive days. The traditional Monday-Wednesday-Friday schedule works well. You can use any three days, though.
- Every training day begins with the most physically demanding exercise - squat or deadlift.
- Do sets across on the basic barbell exercises, meaning that you'll keep the same weight for all working sets. Every time you complete all sets for the targeted reps, add 2,5 kg to the bar.

The deadlift is an exception. Bump up the weight by 5 kg per week on rack pulls. When this no longer is doable, go up in 2,5 kg increments.

- In the novice phase of this program, deadlifts are performed off pins in a power rack or off blocks just below knee level. The reason for this is that beginners to lifting weights have often difficulty grasping what the body is supposed to be doing when deadlifting off the floor.

Without somebody by their side to check their form, they often lift with their lower back excessively rounded or otherwise develop bad lifting habits like pulling with bent arms or shrugging the shoulders at the top. Pulling off pins or blocks limits the ROM, and allows people plenty of time to learn smooth execution of the movement before moving on to pulling from the floor.

- **Your most important goal is to add more weight to the bar or perform more reps with a given weight than last time** - with good form, of course. Continuously beating the numbers written in your training journal is where the game's played.

• I would recommend using only the bar the first time around for honing your technique and getting accustomed to the lifts if you have little or no previous experience with barbell lifting. This is not a sprint, it's a marathon. The patient ones will always trump those seeking quick fixes. Starting light never hurt anyone. And you'll be reaping the rewards far longer down the line if you don't let your ego get in the way.

Again, the deadlift is an exception here. Simply pick a weight that is somewhat challenging but not all too hard to lift. That's your starting weight.

• **You lift weights to build muscle, get stronger and faster.** This can never be stated often enough. Burning fat (if that is your goal) will be accomplished through a smart, balanced diet and cardio. Your strength training sessions will vary very little whether the objective is to gain or cut weight.

• Once you can do the targeted amount of reps with perfect form on the bodyweight exercises, start adding extra weight as you would with the barbell lifts or move on to a harder progression.

• **You should be in and out of the gym in about an hour.** The goal is to complete the main session of the workout in 60 minutes or less, regardless of the total number of sets prescribed. Doing this builds in an anaerobic conditioning effect during strength training sessions, which will help increase the athlete's work capacity.¹²⁴

• **Stick at it for the 3-6 months or so it'll take you to complete this phase and stay true to it to make the biggest gains.** Do not, however, make alterations unless you have a very, very good reason to do so (injury). There is no reason whatsoever to be incorporating isolation exercises like triceps kickbacks or DB flyes into this.

Don't become yet another program raping douchebag or impatient idiot with program jumping ADD.

There's way too many of those already.

What to do on rest days?

Go for a walk, play a sport, run up a hill or rest.

Troubleshooting

- There will come a time when you're no longer able to add weight to the bar from one week to the next. The weights get tough and your performance hits a plateau, so that you're moving the same weights for the same or less reps than what you previously were capable of. At this point, you'll perform a "reset" where you just reduce the weights by 10-15% off your best numbers.

As an example, if you hit 100 kg for 5 reps as your best performance but can't get past that barrier during the following two weeks, you'll drop the weights to 85-90 kg, and start climbing back up over the next few weeks.

- Generally, you'll be able to successfully reset 2-3 times before that strategy ceases working as well.

At this juncture, it's time to drop the sets across method and move on to performing just a single top set of 5 reps with the ramping up method. You'll be able to milk out more strength gains for another while, especially when utilizing the reset method after a plateau. However, this, too, is merely delaying the inevitable, meaning that you're at the end of your "newbie gains" brought about by the sets across method, and variations in the lifting protocol need to be introduced for additional strength gains.

Off Weeks vs. Deloads

If you started light, followed the instructions (especially under "troubleshooting") and put your heart and balls into following the program, then you should have been able to make continuous strength improvements for at least 12-16 weeks before moving on to the next training phase.

After an intense training period guys typically feel a little burnt out from lifting weights, and require a short break to allow for mental and physical recuperation. You want to be hungry for hitting the weights, and time off will restore that hunger if you've felt physically fatigued or experienced any decline in motivation.

I prefer taking a complete week off from the gym to a deload week (where you still train but reduce training volume and intensity) for beginner guys. The main reason for this is that the male ego is a

curious thing, and many times people decide to test their 1 rep maxes during a structured deload phase. So essentially, they're inducing further stress on the body at a time when they're supposed to be recovering and setting themselves up for success in the next training cycle. Then at the beginning of that new cycle they notice that the weights feel heavy and their performance is suffering.

Not very smart if you ask me.

As you become more advanced as a lifter and know your body better, a deload is a viable (although not necessarily any better) option to skipping an entire week from the gym.

Just remember that deload weeks are phases when you take weight OFF the bar. Don't turn them into a lifting contest and undermine your future training efforts by letting your ego take over.

PHASE 2

As discussed above, there will come a time when improving every workout even with one top set is no longer possible. At that point we're going to switch things up a little by introducing a concept called Reverse Pyramid Training that'll allow us to make further strength gains while still training full-body 3x/week.

You'll also notice that we're adding a little more variety into the workouts in terms of exercise selection. Whereas Phase 1 was designed mainly around barbell exercises, we're now adding in more dumbbell work as well as a conditioning component (farmer's walks) on Day 1 and 3 in Phase 2.

Day 1	Sets & Reps	Rest (sec.)
1) Squat	1 x 6-8; 1 x AMAP @90%; 1 x AMAP @80%	180
2) Bench Press	1 x 5-8; 1 x AMAP @90%; 1 x AMAP @80%	120-150
3a) 1 Arm DB Row	2 x 10-12; 1 x 15-20	60
3b) 1 Arm DB Military Press	3 x 8-12	60
4a) Barbell Curl*	3 x 12-15	45
4b) Close Grip Push-Up	3 x 10-12	45
5) Farmer's Walk	3 x MAX**	60

* Use a fat bar or Fat Gripz if available. A thicker bar makes a straight bar curl easier on the joints.

** For distance or time.

Day 2

1) Rack Deadlift	1 x 5-8; 1 x AMAP @90%; 1 x AMAP @80%	180
2) Push Press	1 x 5-8; 1 x AMAP @90%; 1 x AMAP @80%	120-150
3) Pause Squat*	3 x 3 @60% of Top Set on Day 1	180
4a) 1/2 Kneeling Pallof Press	3 x 6 per side	60
4b) Back Extension	3 x 12-15	60

* Focus on explosiveness out of the hole (bottom position of the squat).

Day 3

1) Squat	1 x 3-5; 1 x AMAP @90%; 1 x AMAP @80%	180
2a) 15-30° Incline DB Bench Press	1 x 6-8; 1 x 8-10; 1 x 10-12	120
2b) Close Grip Chin-Up	3 x 6-8	120
3a) DB Romanian Deadlift	3 x 10-12	60
3b) Power Shrug	3 x 8-12	60
4) Single Side Farmer's Walk	3 x MAX*	30

* For distance or time.

Instructions - Phase 2

- Same as Phase 1, train three days per week on non-consecutive days.
- Big barbell lifts (squat, bench, deadlift and press) are performed reverse pyramid style. After the warm-up, the first set you perform will be in the 5-8 rep range (except for squats which are for 6-8 reps on **Day 1** and 3-5 reps on **Day 3**) and is the heaviest of the day on that lift. After the first set, you'll strip off 10% of the weight and perform another set, striving to hit as many reps as possible (AMAP). For the third set, again decrease the weights by 10% and go AMAP.

Note that you should be able to perform approximately the same amount of reps for each of the three sets, if the first set was VERY hard (i.e. 7-7-7). If, however, the first set felt light and you feel like you left a few reps in the tank, you'll want to push the reps up on the back-off sets (i.e. 8-10-12).

Here's what this would look like in a sample workout with squats and 100 kg on the bar.

Set 1 - 100 kg x 8
Set 2 - 90 kg x 8 (90% of Set 1)
Set 3 - 80 kg x 9 (90% of Set 2)

Since 90% of 90 kg is 81 kg, you'll want to round the number up or down to the closest 2.5 kg increment, which in this case is 80 kg.

- When you reach the upper end of the rep range (i.e. 8 reps) with a given weight, add more weight to the bar next time.
- **Go for PR's on both the first set as well as the back-off sets whenever you can.**
- For pause squats on **Day 2**, you're going to pick a weight that is 60% of the weight that you squatted with on the first set of Day 1. So, if you performed 100 kg for 6-8 reps on Day 1, you'll go with 60 kg on the pause squats. Descend under control as usual, pause for a 1-2-3 count at the bottom and explode up.

The key here is to accelerate the bar as fast as possible out of the bottom position. Give it everything you've got and try to launch yourself through the gym roof into outer space (while keeping your feet firmly rooted to the ground and the bar on your traps).

This lighter squatting day allows you to recover, reinforce solid technique and work on bottom position strength and speed between the two heavier squat workouts.

- With the farmer's walks at the end of **Day 1** and **Day 3**, you've got to work with the setup of the gym you're attending.

If you're lucky enough to be training in a strength gym, you'll probably have access to farmer's walk implements and maybe even a 40 yard turf. In a setting like this, you'd load up the weights, choose a set distance (for instance, 3 times to and fro), and try to beat that result over time either by extending the distance you've covered or going up in weights.

Then again, in a public gym you probably won't have access to special strength training equipment or even have too much extra space to walk over long distances (all those cardio machines take up a ton of space). Pick up a pair of kettlebells or dumbbells, try to find enough ground where you can cover at least 10 meters in one direction, and simply walk back and forth with the weights. You'll soon discover that having to turn around or change direction while carrying brutally heavy weights in your hands is an excellent core exercise.

PHASE 3

Once you've gotten proficient at the big barbell lifts and have milked out the gains from linear progression with the full-body workouts from the beginner section (Phase 1 & 2), it's time to switch things up a bit.

A typical modification at this point is having clients move on to an upper/lower body split with four training sessions per week which looks like this on paper:

Mon - Upper Body 1

Tue - Lower Body 1

Thu - Upper Body 2

Sat - Lower Body 2

Again, the actual days of the week you train are quite irrelevant. Make the sessions fit your schedule, and try to organize your life so that you don't end up training more than three days in a row when following this upper/lower plan.

Something I learned from Jay Ferruggia is that an awesome template for a strength training session goes like this:

- 1. Explosive/power exercise**
- 2. Big barbell strength exercise for upper and/or lower body**
- 3. Dumbbell or bodyweight exercises for assistance**
- 4. Strongman finisher**

You'll discover that all of the intermediate upper/lower workouts in this manual follow this structure (except for the strongman finisher, which I've replaced with direct arm and core work due to the fact that most people don't have access to the equipment required for that stuff... but if you do, then feel free to finish your training sessions with a strongman exercise like sandbag carries, log clean & presses, keg tosses, Prowler pushes or sled drags). The beauty of it all is that you

could literally run this model for an eternity and keep getting stronger, so long as you keep a few things in mind...

First, you'll want to rotate the main strength movements in and out from one training cycle to the next. Mind you, this doesn't mean you jump from one exercise to another every two weeks to "keep your muscles guessing" or whatever the magazines tell you. You want to switch things up to overcome plateaus, keep things mentally refreshing and prevent overuse injuries.

An exception to this would be if you were training for a powerlifting competition. In that case you really have no option but to consistently squat, bench and deadlift from the floor leading up to the competition because those are the lifts you'll be judged upon. Nobody cares what you floor pressed two weeks prior to the meet if you get stapled to the bench by the weight under meet conditions.

Another exception would be if you're getting stronger on a constant basis, have no injuries or minor aches to tend to, and feel awesome every time you enter the gym. Should you fit the description perfectly, then by all means, don't deviate from what you're doing.

Second, you also want to change the loading protocol from time to time. So during one cycle you may train mainly in the 4-6 rep range, whereas in the next you may want to bump the reps up to 8-10.

Third, the exercises you select should be big, compound exercises. You will track them and consistently aim to set new rep PR's. If your programming is smart (as it will be if you follow the instructions presented in this book), you will be able to make rapid strength gains during one 8-12 week training block that you would then follow up with either a complete week off or a deload week, when you cut the volume and intensity back to allow for recovery. After the deload you will then start the next cycle with slightly lighter weights, which will allow you to gain momentum, and ramp back up to and beyond your previous bests over time.

When you get more advanced and/or more beat up from heavy training, you may want to implement a short deload every 4-8 weeks.

How to plug exercises into an upper/lower training template?

You're simply going to pick a corresponding exercise for each category, and plug it into the template laid above.

Some exercises and their categories have been listed below.

Explosive/power exercise:

Power Clean, Snatch Grip High Pull from Hang, Medicine Ball Throw, Box Jump, Vertical Jump

Upper Body Horizontal Pushing Exercise:

Bench Press, Incline Bench Press, Floor Press

Upper Body Vertical Pushing Exercise:

Military Press, Push Press, Behind the Neck Push Press

Lower Body Strength Exercise (Quad-Dominant):

Squat, Front Squat, Pause Squat

Lower Body Strength Exercise (Hip-Dominant):

Deadlift, Sumo Deadlift, Deadlift off Blocks

On paper, two sample days could look like this:

Day 1 - Upper Body

1. Snatch Grip High Pull from Hang
2. Bench Press
- 3a. Ring Chin-Up
- 3b. 1 Arm DB Push Press
4. Farmer's Walk

Day 2 - Lower Body

1. Power Clean
2. Front Squat
- 3a. DB Split Squat
- 3b. Hip Thrust
4. Sled Drag

As you'll notice by looking at the upper/lower training programs on the next few pages, every session is built around a power exercise followed by a big barbell strength exercise (bench, squat, military, deadlift) with an equal amount of pressing and pulling.

Dumbbell and bodyweight assistance work is designed to prevent strength imbalances, build muscle, strengthen weak areas and assist the basic lifts. Thus, assistance exercises allow us to implement more volume for additional strength and hypertrophy gains while giving the joints a break from heavy loading. As icing on the cake, add isolation exercises and body part specialization (arms, calves, back, neck & trap work, etc.) to the template as you see fit, and congrats! You've got yourself a helluva training plan.

Why do we first need to build a strength base in Phase 1 & 2 before implementing power exercises?

According to Zatsiorsky, **maximal strength is regarded as a pre-requisite for high movement speed**. It's impossible for athletes to generate a large force in a fast movement if they can't develop similar or even greater force values in a slow motion.¹²⁵

The simple act of increasing strength for the novice lifter will increase his power, since power depends on strength¹²⁶ and strength improves rapidly for a novice. For the more advanced trainee, training for power requires the use of exercises on which heavy loads are moved quickly, such as the Olympic lifts - the snatch and the clean & jerk and their derivatives - which can't be done slowly.¹²⁷

So, when you have a novice guy with something like a 1RM of 60 kg on the back squat, he's not strong enough to be generating a lot of explosive force required to perform a power exercise such as a hang clean or vertical jump. The fastest way to increase his potential for a heavier hang clean or a higher vertical jump is to increase his relative strength (strength-to-bodyweight ratio), since maximum strength markedly contributes to power and explosiveness at light and heavy loads.¹²⁸

Additionally, research supports the notion that increasing your relative strength is also beneficial for enhanced sprinting speed^{129,130,131,132} and change-of-direction ability¹³³ but further discussion on this topic is beyond the scope of this book.

For a real-life example of how this translates into athletic performance, suppose our exemplary novice 60 kg squatter is a soccer player. Doubling his squat to 120 kg as soon as possible will result in improved vertical leap and linear speed, which will allow him to excel on the playing field. A guy who is faster and can jump higher will be able to win more ball possession for his team than a weaker and slower version of himself simply because getting stronger enhances acceleration, change of direction, running economy and decreases fatigue from repeated sprint efforts.

What if I can't train four times a week?

Sometimes life gets in the way of your training, so the last thing you should do is stress over workouts. Just commit to three training days per week, which would look like this over a four week period:

Week 1

Mon - Upper Body 1

Wed - Lower Body 1

Fri - Upper Body 2

Week 2

Mon - Lower Body 2

Wed - Upper Body 1

Fri - Lower Body 1

Week 3

Mon - Upper Body 2

Wed - Lower Body 2

Fri - Upper Body 1

Week 4

Mon - Lower Body 1

Wed - Upper Body 2

Fri - Lower Body 2

Day 1 - Lower Body 1

Sets & Reps

Rest (sec.)

1) Power Clean from Hang	5 x 3	120
2) Squat	1 x 4-6; 1 x AMAP @90%; 1 x 20	180
3a) Hip Thrust	3 x 8-12	60
3b) BB Romanian Deadlift	3 x 10-12	60
4a) EZ Bar Curl	2 x 10-12; 1 x 15-20	45
4b) EZ Bar Lying Triceps Extension	2 x 10-12; 1 x 15-20	45

Day 2 - Upper Body 1

1) Snatch Pull from Hang*	6 x 5	90
2) Military Press	1 x 4-6; 1 x AMAP @90%; 1 x AMAP @80%	120
3a) Hammer Strength Row	3 x 10-12	60
3b) DB Bench Press	1 x 8-12; 1 x AMAP @90%; 1 x AMAP @80%	60
4a) Lat Pulldown	1 x 10-12; 1 x 12-15; 1 x 15-20	45
4b) Weighted Push-Up	1 x 10-12; 1 x 12-15; 1 x 15-20	45

* Focus on achieving powerful hip extension.

Day 3 - Lower Body 2

1) Power Clean from Hang	4 x 5	120
2) Deadlift*	1 x 4-6; 1 x AMAP @90%; 1 x AMAP @80%	180
3a) DB Bulgarian Split Squat	3 x 8-12	60
3b) DB Shrug	3 x 10-12	60
4a) KB 1/2 Turkish Get-Up	3 x 6-10	60
4b) Glute Ham Raise	3 x 6-10	60

* Off floor, pins or blocks.

Day 4 - Upper Body 2

1) 1 Arm DB Snatch	6 x 4	90
2a) 15-30° Incline Bench Press	1 x 4-6; 1 x AMAP @90%; 1 x AMAP@80%	120
2b) Chin-Up	1 x 6-8; 1 x 8-10; 1 x 10-12	120
3a) Dip	1 x 8-10; 1 x 10-12; 1 x 12-15	60
3b) Seated Cable Row	3 x 10-12	60
4a) Seated Lateral Raise	5 x 20	10
4b) Band Pushdown	5 x 20	60

Instructions - Phase 3

- Train three to four days per week.
- Volume is slightly higher now that we've moved from full-body workouts to a 2-way split. This allows us to perform more repetitions in a given training session - and thus cause greater strength and hypertrophy gains - without hampering recovery.
- Power cleans from the hang position are trained twice per week (**Day 1 & Day 3**) as opposed to once a week in order to learn correct technique faster.
- Power exercises on **Day 2 & Day 4** (snatch pull from hang and 1 arm DB snatch) are fairly easy movements to execute, so they don't necessitate a higher training frequency.
- Main exercises are performed reverse pyramid style similar to the previous phase with one main set and two back-off sets in the 4-6 rep range, except for Squats on **Day 1**, when the second back-off set is a grueling high-rep set for 20 reps. Prepare to be sucking wind hard after that.

PHASE 4

If you started all the way back with the beginner template in Phase 1, you should have had a very productive first 8+ months of solid weight training so far.

Phase 4 is the culmination of this training program. Reps and overall volume are again bumped up slightly from the previous phase, and we've included more isolation work for arms and shoulders.

The goal in this cycle, as always, is to get stronger on the big, compound lifts. However, the added volume coupled with relatively short rest periods on assistance exercises are designed to increase work capacity and toleration for fatigue, which are important for causing a hypertrophic response.

Day 1 - Lower Body 1

Sets & Reps

Rest (sec.)

1) Snatch High Pull from Hang	6 x 3	90
2) Front Squat	1 x 6-8; 1 x AMAP @90%; 1 x AMAP @80%	180
3a) Split-Stance BB RDL	2 x 8-12; 1 x 12-15	60
3b) 1 Leg Box Squat	3 x 6-10	60
4a) Close Grip Chin-Up	4 x 6-8	30
4b) DB Hammer Curl	4 x 12-15	60

Day 2 - Upper Body 1

1) Power Clean & Push Press	3 x 5	120
2a) 1 Arm DB Row	3 x 15-20	60
2b) Ring Push-Up	3 x 6-10	60
3a) L-Sit	3 x MAX	60
3b) DB Front Raise	3 x 12	0
3c) DB Lateral Raise	3 x AMAP	60

Day 3 - Lower Body 2

1) Clean Pull from Hang	6 x 6	90
2) Sumo Deadlift off Blocks	1 x 8-10; 1 x AMAP @90%; 1 x AMAP @80%	180
3a) Hack Squat	5 x 8-12	45
3b) Power Shrug	5 x 12-15	45
3c) Leg Press	5 x 15-20	90
4a) 1 Arm DB Scott Curl	1 x 8-10; 1 x 10-12; 1 x 12-15	0
4b) 1 Arm Cable Pushdown	1 x 8-10; 1 x 10-12; 1 x 12-15	60

Day 4 - Upper Body 2

1) Power Clean & Push Press	6 x 2	
2a) Floor Press	1 x 8-10; 1 x AMAP @90%; 1 x AMAP@80%	120
2b) T-Bar Row	1 x 8-10; 1 x 10-12; 1 x 12-15	120
3a) Dip	100 total reps	90
3b) Neutral Grip Chin-Up	50 total reps	90
4a) Hanging Leg Raise	3 x 10-12	30
4b) Farmer's Walk	3 x MAX	60

Instructions - Phase 4

- Same as Phase 3, train three to four days per week.
- Power clean & push presses are trained twice per week (**Day 2** & **Day 4**) as opposed to once a week in order to learn correct technique faster. You can do these from the hang position, off blocks below knee level or off the floor, if your form is good.

On **Day 2** you perform 3 sets of 5's across and on **Day 4** your work up to 1-2 sets of heavier weights, then back off slightly and focus on explosiveness with the lighter weights.

- Power exercises on **Day 1** & **Day 3** (snatch high pull and clean pull) are fairly easy movements to execute, so they don't necessitate a higher training frequency.
- Perform the L-sit exercise on **Day 2** on parallettes or dip station bars and move on to gymnastic rings when you can hold the position for 15-20 seconds in a row. If you can't maintain correct position with straight legs, keep them tucked.
- The giant set consisting of hack squats, power shrugs and leg presses on **Day 3** is a man-maker. Higher rep training for legs is painful but excellent for added size.

APPENDIX

RECOMMENDED LITERATURE

Nothing makes me happier than being able to point a friend or client in the right direction, so that they too can seek the TRUTH amidst all the dogmatic ideas revolving around nutrition, training systems and methods, what equipment to use etc.

Below are a few resources I urge you to check out. Read through and your knowledge of training and nutrition will be miles ahead of 98% of the entire population.

I have included a few more scientific resources as well, in case you want to dig deeper into the "why's" of fitness.

Training and Nutrition

- Aragon, Alan - **Alan Aragon Research Review**
- Contreras, Bret - **Advanced Techniques in Glutei Maximi Strengthening**
- Contreras, Bret and Chris Beardsley - **Strength & Conditioning Research Review**
- Cressey, Eric - **Maximum Strength**
- Everett, Greg - **Olympic Weightlifting for Sports**
- Hale, Jamie - **Knowledge and Nonsense: The Science of Nutrition and Exercise**
- Hale, Jamie - **Should I Eat the Yolk?**
- Low, Steven - **Overcoming Gravity**
- Pilon, Brad - **Eat. Stop. Eat**
- Rippetoe, Mark - **Starting Strength 3rd ed.**
- Siff, Mel - **Facts and Fallacies of Fitness**
- Siff, Mel - **Supertraining**
- Starr, Bill - **The Strongest Shall Survive**
- Venuto, Tom - **Burn the Fat, Feed the Muscle**
- Wendler, Jim - **5/3/1**
- Zatsiorsky, Vladimir - **Science and Practice of Strength Training**

RECOMMENDED TRAINING EQUIPMENT

The following is a list of training equipment I use myself and highly recommend to all friends and clients.

I am not affiliated with the companies selling these products, and will not be compensated in any way whatsoever for recommending a certain piece of equipment.

If I don't use it I WILL NOT recommend it.

Squat Shoes - Nike Romaleos 2

Hit a deeper squat with better form and eliminate butt tucking in the blink of an eye.

Friends don't let friends squat without a pair of proper weightlifting shoes.

Foam Roller & Lacrosse Ball by Rogue Fitness

As Eric Cressey says, foam rolling and lacrosse/tennis ball work are like having the world's cheapest massage therapist available to you 24/7.

Spud Straps by Spud Inc.

The hallmark yellow straps from Spud will be the only pair you'll ever need for securing your grip on heavy rows and pulls.

Captains of Crush Grippers by IronMind

It's never a bad idea to improve grip strength. But ease into it. Excessive amounts of grip work can lead to elbow problems.

Fat Gripz

These bad boys build the forearms and grip strength by turning a standard bar or dumbbell into a fat bar. The added thickness also makes it easier on the joints with exercises that can really bang up your wrists and elbows - such as the straight barbell curl.

Disclosure

As I have already stated, I only recommend and provide links to buy products or services that I wholeheartedly recommend and use myself. However, to make sure I cover my ass, please assume that for every recommendation or link in this manual I'm receiving monetary compensation, sex, swag, and champagne. Lots and lots of champagne.

THE LAST WORD

I don't know your goals or experience level, but I hope that this book has been useful to you. That it will help you in getting where you want to be more quickly, and with less of the hassles and obstacles that so often get in the way.

If you have any questions, suggestions, comments, cheers, jeers or simply want to say hello, by all means drop me a line. Tell me what you liked about the book, what could have been better, how you benefited from it and what you would like to see in a (possible) future revision.

If you learned something new, got stronger or otherwise improved your life in any shape or form whatsoever by implementing a tip in the book, I DEFINITELY WANT to hear from you. After all, I'm human and really do appreciate supportive e-mails from clients and readers.

You can contact me at: yunus@next-level-athletics.com.

Now that we've come to the end of this book, here's what to do next...

1. Don't keep this good stuff a secret. **Share the book with your friends on Facebook, Twitter** or whichever online avenue you frequently visit by directing them to the book's download page at <http://www.next-level-athletics.com>

2. Help a bro out and **hit the LIKE button on our Facebook page:**
<https://www.facebook.com/NextLevelStrengthConditioning>

3. Head back to the blog and **join the conversation** by clicking **HERE:**
<http://www.next-level-athletics.com/blog>

I'll be talking to you soon, my friend.

- Yunus

ABOUT THE AUTHOR

Yunus Barisik, CSCS, is the owner and head trainer at Next Level Athletics in Helsinki, Finland. He has worked with hundreds of clients from all walks of life - from business owners and office workers to junior and high school hockey players all the way to the collegiate and pro levels.

Combining old school training methods with the latest research, Yunus helps his clients get stronger, faster, leaner and more awesome in general as fast as humanly possible through proper strength training and nutrition prescription.

For more information, please visit www.next-level-athletics.com or you can e-mail Yunus anytime at yunus@next-level-athletics.com.

REFERENCES

-
- ¹ Hale, Jamie. *Knowledge and Nonsense: The Science of Nutrition and Exercise*. MaxCondition Publishing, 2007: 363.
- ² Contreras, Bret, and Chris Beardsley. *Strength & Conditioning Research*. Mar 2011: 2.
- ³ "Tea and Crumpets with Glenn Pendlay!" *Bodybuilding.com*. May 5, 2005. 5 Nov 2013. http://www.bodybuilding.com/fun/core_march_1.htm
- ⁴ "Talking Shop With Mike Robertson". *TonyGentilcore.com*. December 8, 2009. 5 Nov 2013. <http://www.tonygentilcore.com/blog/talking-shop-with-mike-robertson/>
- ⁵ Baechle, T. R., and Roger W. Earle. *Essentials of Strength and Conditioning*. 3rd Ed. National Strength and Conditioning Association, 2008: 191.
- ⁶ Baechle, T. R., and Roger W. Earle. *Essentials of Strength and Conditioning*. 3rd Ed. National Strength and Conditioning Association, 2008: 180.
- ⁷ Schaff, Rick. *Misled*. Rick Schaff Productions, 2008: 53-57.
- ⁸ Pilon, Brad. *Eat Stop Eat*. 5th Ed. Strength Works, 2012: 13-14.
- ⁹ Shaw, Bud. "18 Athlete Explanations for Failed Drug Tests". *Mentalfloss.com*. March 26, 2012. 14 Jul 2013. <http://mentalfloss.com/article/30300/18-athlete-explanations-failed-drug-tests>
- ¹⁰ "Melky Cabrera eyed for failed plot?" *ESPN.com*. August 21, 2012. 14 Jul 2013. http://espn.go.com/mlb/story/_/id/8282185/san-francisco-giants-melky-cabrera-launched-fake-website-ruse-report-says
- ¹¹ Hartgens, F. et al. Effects of Androgenic-Anabolic Steroids in Athletes. *Sports Medicine*. 2004 Jul; 34(8):513-554.
- ¹² Bhasin, S. et al. The Effects of Supraphysiologic Doses of Testosterone on Muscle Size and Strength in Men. *The New England Journal of Medicine*. 1996 Jul; 335(1):1-7.
- ¹³ Forbes, GB. The effect of anabolic steroids on lean body mass: The dose-response curve. *Metabolism*. 1985 Jun; 34(6):571-573.
- ¹⁴ Bhasin, S. et al. Testosterone dose-response relationships in healthy young men. *American Journal of Physiology - Endocrinology and Metabolism*. 2001 Dec; 281:E1172-E1181.
- ¹⁵ Bomze, JP. et al. Anabolic Steroids: A historical and clinical perspective. *Strength and Conditioning Journal*. 1991 Oct;13(5):42-46.
- ¹⁶ Tokish, JM. et al. Ergogenic Aids: A Review of Basic Science, Performance, Side Effects, and Status in Sports. *The American Journal of Sports Medicine*. 2004 Sep; 32(6):1543-1553.

-
- ¹⁷ NSCA's Performance Enhancing Substances Abuse Committee. Steroid Education: What the coach, athlete and parent need to know about anabolic drugs: A fact sheet. *Strength and Conditioning Journal*. 1989 Dec; 11(6):10-13.
- ¹⁸ Yesalis, CE. et al. Self-reported use of anabolic-androgenic steroids by elite power lifters. *Physician and Sportsmedicine*. 1988 Dec; 16(12):91-100.
- ¹⁹ Wagman, D. F., et al. An Investigation Into Anabolic Androgenic Steroid Use by Elite U.S. Powerlifters. *The Journal of Strength and Conditioning Research*. 1995 Aug; 9(3):149-154.
- ²⁰ Tricker, R. et al. The incidence of anabolic steroid use among competitive bodybuilders. *Journal of Drug Education*. 1989; 19(4):313-325.
- ²¹ Hackett, DA. et al. Training Practices and Ergogenic Aids Used by Male Bodybuilders. *The Journal of Strength and Conditioning Research*. 2013 Jun; 27(6):1609-1617.
- ²² Kersey, RD. Anabolic-Androgenic Steroid Use by Private Health Club/Gym Athletes. *The Journal of Strength and Conditioning Research*. 1993 May; 7(2):118-126.
- ²³ Perry, HM. et al. Dying to be big: a review of anabolic steroid use. *British Journal of Sports Medicine*. 1992 Dec; 26(4):259-261.
- ²⁴ Frankle, MA. et al. Use of Androgenic Anabolic Steroids by Athletes. *The Journal of the American Medical Association*. 1984 Jul; 252(4):482.
- ²⁵ Taylor, WN et al. Pervasive anabolic steroid use among health club athletes. *Annals of Sports Medicine*. 1987; 3(3):155-159.
- ²⁶ Kraemer, William J. *Strength Training for Sport*. Blackwell Science, 2002: 1.
- ²⁷ Butt, Casey. *Your Muscular Potential: How to Predict Your Maximum Muscular Bodyweight and Measurements*. 4th ed. Myogenic Enterprises, 2009: 49.
- ²⁸ "IFBB Pro Dave Goodin Talks With Fitoverfat.com". *Fitoverfat.com*. April 1, 2011. 5 Nov 2013. <http://www.fitoverfat.com/dave-goodin-interview/>
- ²⁹ "Inside the Life of a Natural Pro, Episode #18: Meet Dave Goodin!" March 12, 2008. 5 Nov 2013. *Bodybuilding.com*. <http://www.bodybuilding.com/fun/insidethelife18.htm>
- ³⁰ Saxon, Arthur. *The Development of Physical Power*. O'Faolain Patriot, 1906: 102.
- ³¹ McDonald, Lyle. *The Stubborn Fat Solution*. Lyle McDonald Publishing, 2008: 14.
- ³² Butt, Casey. *Your Muscular Potential: How to Predict Your Maximum Muscular Bodyweight and Measurements*. 4th ed. Myogenic Enterprises, 2009: 19.
- ³³ Hackenschmidt, George. *The Way to Live*. O'Faolain Patriot, 1908: 8-10.
- ³⁴ Hackenschmidt, George. *The Way to Live*. O'Faolain Patriot, 1908: 49.
- ³⁵ Hackenschmidt, George. *The Way to Live*. O'Faolain Patriot, 1908: 12.

-
- ³⁶ New, David C. "Notes on Arnold Schwarzenegger's competitive weightlifting and powerlifting history 1963 - 1968". *GMV.com*. January 29, 2005. 5 Nov 2013. <http://www.gmv.com.au/default.asp?pageid=home&template=content&sid=283>
- ³⁷ Hale, Jamie. *Knowledge and Nonsense: The Science of Nutrition and Exercise*. MaxCondition Publishing, 2007: 428.
- ³⁸ Zatsiorsky, Vladimir. *Science and Practice of Strength Training*. 2nd Ed. Human Kinetics, 2006: 4.
- ³⁹ González-Badillo, JJ. et al. Moderate Resistance Training Volume Produces More Favorable Strength Gains Than High or Low Volumes During a Short-Term Training Cycle. *The Journal of Strength and Conditioning Research*. 2005 Aug; 19(3):689-697.
- ⁴⁰ González-Badillo JJ. et al. Moderate Volume of High Relative Training Intensity Produces Greater Strength Gains Compared With Low and High Volumes in Competitive Weightlifters. *The Journal of Strength and Conditioning Research*. 2006 Feb; 20(1):73-81.
- ⁴¹ Hale, Jamie. *Knowledge and Nonsense: The Science of Nutrition and Exercise*. MaxCondition Publishing, 2007: 379-380.
- ⁴² Schoenfeld, BJ. et al. Is Postexercise Muscle Soreness a Valid Indicator of Muscular Adaptations? *Strength and Conditioning Journal*. 2013 Oct; 35(5):16-21.
- ⁴³ Contreras, Bret, and Chris Beardsley. *Strength & Conditioning Research*. Nov 2013: 5.
- ⁴⁴ Smith, LL. Causes of Delayed Onset Muscle Soreness and the Impact on Athletic Performance: A Review. *The Journal of Applied Sport Science Research*. 1992 Aug; 6(3):135-141.
- ⁴⁵ Perryman, Matthew. *Maximum Muscle: The Science of Intelligent Physique Development*. 2009: 73-74.
- ⁴⁶ Kraemer, William J. *Strength Training for Sport*. Blackwell Science, 2002: 16.
- ⁴⁷ Tan, B. Manipulating Resistance Training Program Variables to Optimize Maximum Strength in Men: A Review. *The Journal of Strength and Conditioning Research*. 1999 Aug; 13(3):289-304.
- ⁴⁸ Rippetoe, Mark. "Who Wants to Be a Novice? You Do". *T-Nation.com*. December 13, 2010. 6 Jul 2013. http://www.t-nation.com/free_online_article/most_recent/who_wants_to_be_a_novice_you_do
- ⁴⁹ Contreras, Bret. "Max Out on Squats Every Day". *T-Nation.com*. June 28, 2011. 6 Jul 2013. http://www.t-nation.com/free_online_article/most_recent/max_out_on_squats_every_day
- ⁵⁰ Siff, Mel. *Supertraining*. 6th Ed. Supertraining Institute, 2003: 33.
- ⁵¹ Zatsiorsky, Vladimir. *Science and Practice of Strength Training*. 2nd Ed. Human Kinetics, 2006: 60.
- ⁵² DeLorme, TL. Restoration of muscle power by heavy-resistance exercises. *The Journal of Bone & Joint Surgery*. 1945 Oct; 27(4):645-667.
- ⁵³ Weiss, LW. The Obtuse Nature of Muscular Strength: The Contribution of Rest to its Development and Expression. *The Journal of Applied Sport Science Research*. 1991; 5(4):219-227.

-
- ⁵⁴ Schoenfeld, Brad. *The MAX Muscle Plan*. Human Kinetics, 2013: 22.
- ⁵⁵ McLester, JR. et al. Comparison of 1 Day and 3 Days Per Week of Equal-Volume Resistance Training in Experienced Subjects. *The Journal of Strength and Conditioning Research*. 2000 Aug; 14(3):273–281.
- ⁵⁶ Wernbom, M. et al. The Influence of Frequency, Intensity, Volume and Mode of Strength Training on Whole Muscle Cross-Sectional Area in Humans. *Sports Medicine*. 2007 Mar;37(3):225-264.
- ⁵⁷ Rhea, MR. et al. A Meta-analysis to Determine the Dose Response for Strength Development. *Medicine & Science in Sports & Exercise*. 2003 Mar; 35(3):456-464.
- ⁵⁸ Gallagher, Marty. *The Purposeful Primitive*. Dragon Door Publications, 2008: 89-91.
- ⁵⁹ Rippetoe, Mark, and Lon Kilgore. *Practical Programming for Strength Training*. 2nd Ed. The Aasgaard Company, 2009: 49.
- ⁶⁰ Schoenfeld, Brad. *The MAX Muscle Plan*. Human Kinetics, 2013: 153.
- ⁶¹ Gentil, P. et al. Effect of adding single-joint exercises to a multi-joint exercise resistance-training program on strength and hypertrophy in untrained subjects. *Applied Physiology, Nutrition, and Metabolism*. 2013 Mar; 38(3):341-344.
- ⁶² Spinetti, J. et al. Influence of Exercise Order on Maximum Strength and Muscle Volume in Nonlinear Periodized Resistance Training. *The Journal of Strength and Conditioning Research*. 2010 Nov; 24(11):2962-2969.
- ⁶³ Baechle, T. R., and Roger W. Earle. *Essentials of Strength and Conditioning*. 3rd Ed. National Strength and Conditioning Association, 2008: 391.
- ⁶⁴ Brink, Will. *Bodybuilding Revealed*. Will Brink & Internet Publications: 531.
- ⁶⁵ Spreuwenberg, LPB. et al. Influence of Exercise Order in a Resistance-Training Exercise Session. *The Journal of Strength and Conditioning Research*. 2006 Feb; 20(1):141–144.
- ⁶⁶ Sforzo, GA. et al. Manipulating Exercise Order Affects Muscular Performance During a Resistance Exercise Training Session. *The Journal of Strength and Conditioning Research*. 1996 Feb; 10(1):20-24.
- ⁶⁷ Otto, RM. et al. A critical analysis of the single versus multiple set debate. *Journal of Exercise Physiology-online*. 2006 Feb; 9(1):32–57.
- ⁶⁸ Carpinelli, RN. et al. Strength Training: Single Versus Multiple Sets. *Sports Medicine*. 1998 Aug; 26(2):73-84.
- ⁶⁹ Carpinelli, RN. et al. Strength Training: Single Versus Multiple Sets [Reply]. *Sports Medicine*. 1999 Jun; 27(6):409-416.
- ⁷⁰ Winett, RA. Meta-Analyses Do Not Support Performance of Multiple Sets or High Volume Resistance Training. *Journal of Exercise Physiology-online*. 2004 Oct; 7(5):10-20.
- ⁷¹ Hass, CJ. et al. Single versus multiple sets in long-term recreational weightlifters. *Medicine & Science in Sports & Exercise*. 2000 Jan; 32(1):235-242.

- ⁷² Humburg, H. et al. 1-Set Vs. 3-Set Resistance Training: A Crossover Study. *The Journal of Strength and Conditioning Research*. 2007 May; 21(2):578–582.
- ⁷³ Galvao, DA. et al. Single- Vs. Multiple-Set Resistance Training: Recent Developments in the Controversy. *The Journal of Strength and Conditioning Research*. 2004 Aug; 18(3):660–667
- ⁷⁴ Stone, MH. et al. Athletic Performance Development: Volume Load -1 Set vs. Multiple Sets, Training Velocity and Training Variation. *Strength and Conditioning Journal*. 1998 Dec; 20(6):22-31.
- ⁷⁵ Byrd, R. et al. Strength Training: Single Versus Multiple Sets [Reply]. *Sports Medicine*. 1999 Jun; 27(6):409-416.
- ⁷⁶ Kramer, JB. et al. Effects of Single vs. Multiple Sets of Weight Training: Impact of Volume, Intensity, and Variation. *The Journal of Strength and Conditioning Research*. 1997 Aug; 11(3):143-147.
- ⁷⁷ Rhea, MR. et al. Three Sets of Weight Training Superior to 1 Set With Equal Intensity for Eliciting Strength. *The Journal of Strength and Conditioning Research*. 2002 Nov; 16(4):525-529.
- ⁷⁸ Wolfe, B. et al. Quantitative Analysis of Single- Vs. Multiple-Set Programs in Resistance Training. *The Journal of Strength and Conditioning Research*. 2004 Feb; 18(1):35-47.
- ⁷⁹ Krieger, JW. Single Versus Multiple Sets of Resistance Exercise: A Meta-Regression. *The Journal of Strength and Conditioning Research*. 2009 Sep; 23(6):1890-1901.
- ⁸⁰ Krieger, JW. Single vs. Multiple Sets of Resistance Exercise for Muscle Hypertrophy: A Meta-Analysis. *The Journal of Strength and Conditioning Research*. 2010 Apr; 24(4):1150-1159.
- ⁸¹ Marshall, PW. et al. Strength and neuromuscular adaptation following one, four, and eight sets of high intensity resistance exercise in trained males. *European Journal of Applied Physiology*. 2011 Dec; 111(12):3007-3016.
- ⁸² Rhea, MR. Resolving the Single-Versus Multiple-Set Strength Training Debate. *NSCA Hot Topic Series*. [no date]
- ⁸³ Peterson, MD. et al. Applications of the Dose-Response for Muscular Strength Development: A Review of Meta-Analytic Efficacy and Reliability for Designing Training Prescription. *The Journal of Strength and Conditioning Research*. 2005 Nov; 19(4):950-958.
- ⁸⁴ Krieger, J. Determining Appropriate Set Volume for Resistance Exercise. *Strength and Conditioning Journal*. 2010 Jun; 32(3):30-32.
- ⁸⁵ Cardinale, Marco, Robert Newton and Kazunori Nosaka. *Strength and Conditioning: Biological Principles and Practical Applications*. Wiley-Blackwell, 2011: 127.
- ⁸⁶ Baechle, T. R., and Roger W. Earle. *Essentials of Strength and Conditioning*. 3rd Ed. National Strength and Conditioning Association, 2008: 401.
- ⁸⁷ Komi, Paavo. *Strength and Power in Sport: Volume III of the Encyclopaedia of Sports Medicine*. 2nd Ed. Blackwell Science, 2002: 510-511.
- ⁸⁸ Siff, Mel. *Supertraining*. 6th Ed. Supertraining Institute, 2003: 12.

-
- ⁸⁹ Berger, RA. et al. Effects of Fatigue on Performance and Learning of a Gross Motor Task. *The Journal of Applied Sport Science Research*. 1991 Aug; 5(3):155-161.
- ⁹⁰ Francis, Charlie. *The Charlie Francis Training System*. 2012: 43,95.
- ⁹¹ Cressey, Eric. *Maximum Strength*. Da Capo Press, 2008: 15.
- ⁹² Peterson, M. et al. Maximizing Strength Development in Athletes: A Meta-Analysis to Determine the Dose-Response Relationship. *The Journal of Strength and Conditioning Research*. 2004 May; 18(2):377-382.
- ⁹³ Zatsiorsky, Vladimir. *Science and Practice of Strength Training*. 2nd Ed. Human Kinetics, 2006: 80.
- ⁹⁴ Hedrick, A. Training for Hypertrophy. *Strength and Conditioning Journal*. 1995 Jun; 17(3):22-29.
- ⁹⁵ Ahtiainen, Juha. *Neuromuscular, Hormonal and Molecular Responses to Heavy Resistance Training in Strength Trained Men*. (Doctoral dissertation). University of Jyväskylä, Jyväskylä, 2006: 14.
- ⁹⁶ Robinson, JM. et al. Effects of Different Weight Training Exercise/Rest Intervals on Strength, Power, and High Intensity Exercise Endurance. *The Journal of Strength and Conditioning Research*. 1995 Nov; 9(4):216-221.
- ⁹⁷ Willardson, JM. et al. The Effect of Rest Interval Length on Bench Press Performance With Heavy Vs. Light Loads. *The Journal of Strength and Conditioning Research*. 2006 May; 20(2):396-399.
- ⁹⁸ Scudese, E. et al. The Effect of Rest Interval Length on Repetition Consistency and Perceived Exertion During Near Maximal Loaded Bench Press Sets. *The Journal of Strength and Conditioning Research*. 2013 Sep. Published Ahead of Print.
- ⁹⁹ de Salles, BF. et al. Upper And Lower Body Strength Increases Consequent To Different Inter-Set Rest Intervals In Trained Men. *The Journal of Strength and Conditioning Research*. 2010 Jan; 24:1 (Supplement 1).
- ¹⁰⁰ Schoenfeld, Brad. *The MAX Muscle Plan*. Human Kinetics, 2013: 14-15.
- ¹⁰¹ Willardson, JM. et al. A Comparison of 3 Different Rest Intervals on the Exercise Volume Completed During a Workout. *Journal of Strength and Conditioning Research*. 2005 Feb; 19(1):23-26.
- ¹⁰² Rahimi, R. Effect of Different Rest Intervals on the Exercise Volume Completed During Squat Bouts. *Journal of Sports Science and Medicine*. 2005 Dec; 4(4):361-366.
- ¹⁰³ Rahimi, R. et al. The Effect of Different Rest Intervals Between Sets on the Training Volume of Male Athletes. *Facta Universitatis: Series Physical Education and Sport*. 2007; 5(1):37-46.
- ¹⁰⁴ Senna, G. et al. Influence of two different rest interval lengths in resistance training sessions for upper and lower body. *Journal of Sports Science and Medicine*. 2009 Jun; 8(2):197-202.
- ¹⁰⁵ Goto, K. et al. The Impact of Metabolic Stress on Hormonal Responses and Muscular Adaptations. *Medicine & Science in Sports & Exercise*. 2005 Jun; 37(6):955-963.
- ¹⁰⁶ Schoenfeld, BJ. Potential Mechanisms for a Role of Metabolic Stress in Hypertrophic Adaptations to Resistance Training. *Sports Medicine*. 2013 Mar; 43(3):179-194.

- ¹⁰⁷ Schoenfeld, BJ. The Mechanisms of Muscle Hypertrophy and Their application to Resistance Training. *The Journal of Strength and Conditioning Research*. 2010 Oct; 24(10):2857-2872.
- ¹⁰⁸ Baechle, T. R., and Roger W. Earle. *Essentials of Strength and Conditioning*. 3rd Ed. National Strength and Conditioning Association, 2008: 408.
- ¹⁰⁹ Bird, PS. et al. Designing Resistance Training Programmes to Enhance Muscular Fitness. *Sports Medicine*. 2005 Oct; 35(10):841-851
- ¹¹⁰ Willardson, J. M. A brief review: factors affecting the length of the rest interval between resistance exercise sets. *The Journal of Strength and Conditioning Research*. 2006 Nov; 20(4):978-984.
- ¹¹¹ De Salles, BF. et al. Rest Interval between Sets in Strength Training. *Sports Medicine*. 2009 Sep; 39(9):765-777.
- ¹¹² Aragon, Alan. *Research Review*. Mar 2009: 3.
- ¹¹³ Stone, MH. et al. Training to Muscular Failure: Is It Necessary? *Strength and Conditioning Journal*. 1996 Jun; 18(3):44-48.
- ¹¹⁴ Izquierdo, M. et al. Differential Effects of Strength Training Leading to Failure Versus Not to Failure on Hormonal Responses, Strength, and Muscle Power Gains. *Journal of Applied Physiology*. 2006 May; 100(5):1647-1656.
- ¹¹⁵ Izquierdo-Gabarren, M., et al. Concurrent Endurance and Strength Training Not to Failure Optimizes Performance Gains. *Medicine & Science in Sports & Exercise*. 2010 Jun; 42(6):1191-1199.
- ¹¹⁶ Willardson, JM. The Application of Training to Failure in Periodized Multiple-Set Resistance Exercise Programs. *The Journal of Strength and Conditioning Research*. 2007 May; 21(2):628-631.
- ¹¹⁷ Willardson, JM. et al. Training to Failure and Beyond in Mainstream Resistance Exercise Programs. *Strength and Conditioning Journal*. 2010 Jun; 32(3):21-29.
- ¹¹⁸ Medrano, IC. Muscular Failure Training in Conditioning Neuromuscular Programs. *Journal of Human Sport & Exercise*. 2010 May; 5(2):196-213.
- ¹¹⁹ Drinkwater, EJ. et al. Increased Number of Forced Repetitions Does Not Enhance Strength Development with Resistance Training. *The Journal of Strength and Conditioning Research*. 2007 Aug; 21(3): 841-847.
- ¹²⁰ Willardson, JM. The Application of Training to Failure in Periodized Multiple-Set Resistance Exercise Programs. *The Journal of Strength and Conditioning Research*. 2007 May; 21(2):628-631.
- ¹²¹ Rippetoe, Mark, and Lon Kilgore. *Practical Programming for Strength Training*. 2nd Ed. The Aasgaard Company, 2009: 95.
- ¹²² Rippetoe, Mark, and Lon Kilgore. *Practical Programming for Strength Training*. 2nd Ed. The Aasgaard Company, 2009: 99-100.
- ¹²³ Rippetoe, Mark, and Lon Kilgore. *Practical Programming for Strength Training*. 2nd Ed. The Aasgaard Company, 2009: 103-104.

-
- ¹²⁴ Kenn, Joe. *The Coach's Strength Training Playbook*. Coaches Choice, 2003: 19.
- ¹²⁵ Zatsiorsky, Vladimir. *Science and Practice of Strength Training*. 2nd Ed. Human Kinetics, 2006: 160.
- ¹²⁶ Baker, D. et al. The Relation Between Strength and Power in Professional Rugby League Players. *The Journal of Strength and Conditioning Research*. 1999 Aug; 13(3):224-229.
- ¹²⁷ Rippetoe, Mark, and Lon Kilgore. *Practical Programming for Strength Training*. 2nd Ed. The Aasgaard Company, 2009: 44.
- ¹²⁸ Stone, MH. et al. Maximum Strength-Power-Performance Relationships in Collegiate Throwers. *The Journal of Strength and Conditioning Research*. 2003 Nov; 17(4):739-745
- ¹²⁹ Comfort, P. et al. Are changes in maximal squat strength during preseason training reflected in changes in sprint performance in rugby league players? *The Journal of Strength and Conditioning Research*. 2012 Mar; 26(3):772-776
- ¹³⁰ Wisloff, U. et al. Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players. *British Journal of Sports Medicine*. 2004 Jun; 38(3):285-288.
- ¹³¹ Comfort, P. et al. Relationships between strength, sprint and jump performance in well trained youth soccer players. *The Journal of Strength and Conditioning Research*. 2013 Mar. Published Ahead of Print.
- ¹³² McBride, JM. et al. Relationship Between Maximal Squat Strength and Five, Ten, and Forty Yard Sprint Times. *The Journal of Strength and Conditioning Research*. 2009 Sep; 23(6):1633-1636.
- ¹³³ Keiner, M. et al. Long-Term Strength Training Effects on Change-of-Direction Sprint Performance. *The Journal of Strength and Conditioning Research*. 2013 Apr. Published Ahead of Print.