[i/o]

testosterone

how to naturally optimize testosterone production for increased musculature, lower stress, low body fat, & lasting sexual health

by Christopher Walker

the black edition

“The task of a modern educator is not to cut down jungles, but to irrigate deserts.”
- C.S. Lewis

acknowledgements

Thanks mom and dad, for putting me through college. And for being supportive through all the medical issues and when I bucked the trend and left plans for med school or a PhD to go run off to NYC to create things. Testosterone I/O is evidence that my neuroscience education is not going to waste.

This book will teach thousands of people how to improve their own lives via that experience and the accumulation of knowledge over those years. Net win.

supplementary videos

You can log-in to view your supplementary videos at http://testosterone.io/member and your password is *iomember*.
To read this PDF on a tablet like an iPad, Kindle, or Nook, please read these instructions - http://testosterone.io/conversion

foreword

This is an honest program.

If you follow it, you will see results. If don't, you won't. Simple as that. Boolean honesty, I suppose.

The "increase testosterone" market is saturated right now with boner pills and placebos, nonsense short cuts and scams, spammy email lists and false promises.

I've waited so long to write this book because I do not want to be associated with any of that. I needed some time to observe it all, so I can do the opposite. The online fitness industry as a whole, and the hormonal enhancement (ie. pharmaceuticals) sector especially, has made one thing, above all else, central to its business model.

Our discomfort.

We hate being uncomfortable, and they know it. We hate working hard for things, always looking for a short cut, especially if it means we can continue shoveling toxic foodstuffs into our faces and still magically lose our fupa this week.

So I won't mince words when I say, "implementing what I am about to teach will take some good old fashioned hard work over the next 6 months, then into your everyday life."

But the results will definitely be worth the work.

So let's get to it!

Much love,
Christopher M. Walker
Editor NoGym.net
Co-host Road To Ripped podcast
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Note to reader:

Due to the complex nature of the subject matter in this book, and the inconsistent conclusions in the scientific literature with respect to much of it, I want to warn you: this book is dense.

I've done my best to distill it into actionable steps and not get too caught up in the cyclical, self-contradicting confusion that can be scientific research.

After writing much of the content, I made the decision to structure the denser chapters in an easy-to-consume manner. The result is that some chapters are set up with summaries including bullet points of the main takeaways from the discussion.

These takeaway summaries are at the beginning of the chapter, for easy consumption.

Remember, this book is a guide, a reference you'll have for decision-making for years to come. In that light, you are not expected to read it from start to finish. Feel free to cherry pick topics that interest you or apply directly to your personal life or condition, and learn the information about those things.

Some of you will want to sink your teeth into everything, and others will want the takeaways and to move on quickly.

I suggest learning as much as possible about the information presented, as well as the state of the current research on this subject, however, I also understand limitations with respect to interest and understanding of subject matter, as well as time and physical constraints.

Long story short: do whatever you want with this material. It's setup for easy consumption.

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the lay of the land

Biohacking is becoming all-the-rage these days with early adopters, techies, athletes, and hard-charging career-oriented folk.

There are two ways to biohack: true biohacking, and band-aid biohacking.

The latter is getting popular in the blogosphere and has become characterized by taking smart drug cocktails as a way to increase focus, or repackaging sound diet and nutrition principles (ie. get plenty of sleep, eat meat and vegetables, train your body properly) so they become once-again marketable in the never ending recycling process. There's also quite a bit of bogus product popping up all over the band-aid landscape being marketed with 'fear of illness' tactics to folks who are only jumping on this particular bandwagon because they want to seem more intelligent than they really are. Or more hip.

Or something.

There's nothing inherently wrong with band-aid biohacking; In the name of self-experimentation mixed with a little convenience (laziness), I like to mess around with dosing and new drugs/herbs/etc sans sufficient background research. It's a decision I'm happy to make based on quick opportunity cost calculations.

I'm fond of smart drugs (ie nootropics) and believe they have a place in any ambitious routine (I used them liberally when writing this book, for example). And just to be clear, nootropics are not synonymous with band-aid biohacking - they just happen to be the most convenient way to think you're actually hacking something.

And that leads us to the one thing that bothers me about the growing popularity of band-aid biohacking: the use of the word hack.

I'd prefer if people referred to the practice of shotgun pill-popping as: fly-by-night self-experimenting. Or "advanced focus techniques," or something along those lines.

But the word "hack" should not be involved.

Why? Because it's being perverted. Ever since "lifehacking" and lifestyle design took the world by storm earlier this decade, the word hack has been dragged out of context, kicking and screaming away from its pure meaning, and thrust into the popular media spotlight. **As a result, it's been softened & sun-pocked.**

Where it used to connote hours/days/weeks/months of work, it now connotes a shortcut.

Where it used to mean an individual thoroughly understood the system they were attempting to manipulate, now it means, "eh, wtf - if this pill doesn't work I'm on to the next one."

True hacking is like an iceberg.

Countless hours go into mastering the understanding of a system, and if not countless hours, sufficient time to notice flaws and/or understand where all of the manipulation points lie.

After the individual's knowledge has grown to the point of near mastery of this system, he/she can then dive into the manipulation process - because they thoroughly understand what they're doing.

And the hack takes place.

The execution itself is generally a quick process.

The tip of the iceberg.

Band-aid biohacking is like a buoy, floating on the surface - feebly tied by a piece of rope to an anchor somewhere deep in the abyss, far from sight or comprehension. The buoy tosses in the surf.

The iceberg doesn't move.

In this book I attempt to help you build an iceberg mentality. Whether you do anything with the knowledge is up to you. But I do think anybody who reads through these pages, whether they put my advice into action or not, will take away a vast amount of value.

Optimizing your endocrine system is a process that should not be taken with a band-aid biohacking approach. Your hormones are the most potent and powerful chemicals in your body - and they have direct influence on your brain's health.

Manipulating them can change your life, almost immediately. For better or worse. This book is focused on the better.

It's structured logically.
First we will educate ourselves on the system we're going to later attempt to manipulate. This is the endocrine system - a complex interconnected system involving your brain and several key organs, even your gut.

With that knowledge under our belts, we'll move on to identify the manipulation points and the external stimuli we need to apply in order to have a positive influence on them.

Then we'll take action.

By the end, you'll be implementing changes to your current lifestyle that will set you up for hormonal optimization, particularly in the form of increased testosterone and growth hormone, and lower cortisol.

And you'll understand why you're making those changes.

This book is equal parts science & philosophy. Not your typical online fitness spam. In it you will learn how to naturally optimize your endocrine system, yes, but as a whole, you'll learn the overall process that you can use in every aspect of your life to learn at an accelerated rate.

And not just learn, but master things. With thorough understanding.

This book is a framework that you can take with you and apply to the rest of your life.

my story

Before we do anything else, I'd like to begin this program with a story - my story. In a few short pages, you'll understand my motivation behind creating the pages you're about to read today.

I really hope this can inspire you to take immediate action in your own life.

Trust me, if I can raise my testosterone naturally, anybody can. Especially with the right knowledge and tools in the toolbox (ie. this program).

As a freshman in college I got really into endurance sports: running and triathlon, specifically.

I trained a lot, developing an endorphin addiction - a feeling that I believe many other guys can empathize with.

Leaving behind scholarship offers to play baseball in college, I felt burned-out, in need of a change. Baseball had been an enormous part of my life up until that point but I was flat out exhausted.

So I began running.

Running was nice because I didn't need to go to a team practice. I could just go run.

I also thought I was doing something healthy for my body. I started eating really meticulously, and with the decrease in bodyweight, my running times fell as well. I actually started to get competitively fast.

A couple months into my freshman year, I suffered a bout of internal bleeding that landed me in the Duke Intensive Care Unit for a week.

Three duodenal ulcers had been bleeding for 2 weeks, and by the time I got the ER, I was in bad condition.

Long story short, the stress from college along with the chronic additional stress of all the running and dietary restriction did a number on my stomach. It nearly killed me.

Six months of recovery later and I was having trouble getting my health back in order.

Beyond being severely anemic, I felt hopelessly depressed about my life. The thing was, I had no reason to be depressed.

Here I was at an elite university, studying to become a surgeon - an occupation I'd always wanted to pursue - with friends, and a loving family, yet I felt hopelessly miserable.

Something was really wrong.

I was so out-of-sorts that I had to take my sophomore year off of college. I took a medical leave for a year and moved back home.

I took steps to feel better, which at the time meant I devoted much of my free time to training for triathlon while making sure I was eating enough and getting plenty of rest.

I wholeheartedly believed that I was taking the right steps to become healthier.

The more I trained, the faster I got. In just six months I'd qualified for both USAT duathlon and triathlon national championships and was top-10 in all my races that season.

For a competitive guy like myself, this was very fulfilling.

I felt better, I put on a good amount of muscle, and I was far less depressed than

before.

Yet something was still amiss.

Here I was, 20 years old, and I had ZERO libido. No sexual drive whatsoever.

I thought it was strange so I went into the family physician for a checkup, to have him run some blood work.

He ordered the tests.

When we got them back two things alarmed him.

First, my testosterone level was 11 ng/dL.

It was basically nothing.

"This is not normal," he said.

Second, my white blood cell count was abnormal. And my LH and FSH levels as well. A quick scan of the rest of the lab paperwork and he said, "I need to send you to a specialist - something is wrong."

So he sent me to a hematologist/oncologist in Northern Virginia, where I ran through a more extensive set of blood panels and hormone testing.

When the specialist got the results he took a look for a couple minutes and told me he thought I had a brain tumor.

And to be honest, I was actually relieved. I thought "finally! this may explain why I've been feeling so shitty for the last few years." He ordered an MRI and sure enough, there it was.

A tumor in my pituitary gland.

Boy was I relieved. A little scared, but the relief at finally knowing the root of the issues far outweighed any fear.

I opted to not have surgery and to just try to treat it with medication instead. The risk of brain surgery is obviously something anybody in their right mind would be smart to avoid.

So he wrote me a few prescriptions, one of which was for Androgel (a hormone

replacement therapy gel). Not knowing any other alternative, I took the meds and started applying the gel.

Back at university and in the throes of my old stress, I was quickly faced with a decision.

The meds, even though I'd only been on them for a matter of weeks, made me feel like shit. I felt like a zombie with no feelings, as if I was floating through my life. I'd also been contemplating this smelly goo I had to rub all over myself every day.

To be honest, it didn't make me feel a whole lot different. But it damn sure made me hungry all the time. Combined with the antidepressants and myriad other pills I was throwing back every morning with my orange juice, I managed to gain 50 lbs of fat in a matter of 2 months.

Holy crap did that make me miserable. If I ever had a sign of hormonal imbalance, that was it.

Back in school, trying to make new friends after a year off, on a bunch of medications with a brain tumor, and now I'm fat and insecure.

My first solution: to hide in my apartment. If I wasn't going to class, I was in my apartment alone.

My testosterone wasn't noticeably better yet, and I was miserable.

I felt overwhelmed, and sometimes we need to be brought to a point like this in our lives before we are able to make the rash decisions that will lead us out of the nightmare.

So, at what I considered to be a very low point in my young life, I made that rash decision that would have a profound effect on my trajectory moving forward - I threw away all my medications.

Everything.

Even the nutritional supplements and herbal alternatives I'd been experimenting with. All in the trash.

Screw it all. There has to be a better way.

As if part of a Divine plan, I was in the midst of my neuroscience studies, and I realized that I was in the perfect position to take my health into my own hands - to use the resources available to me in my courses and at the university to crack the code and figure out how to solve my ailments naturally.

For whatever reason, I was crazy enough to believe it could be done.

I'd been reading a lot about hydrotherapy and fasting online, and it was just beginning to catch hold in the underground fitness world at the time thanks to Martin Berkhan of LeanGains.com. I devoured his articles, which actually really encouraged me. I started to see fasting as a potential way to optimize my endocrine system without medications.

I also began looking more seriously at the role nutrition could play. It made sense to me that the gut's health would be intricately tied to my brain's health, seeing as they communicate directly and the nutrients we assimilate are used to fuel both our brain and body processes.

So I dug into nutrition and found the primal approach, made popular by Mark Sisson of Marks Daily Apple. It made sense that humans should eat this way, sticking as close to the earth as possible and not shoveling toxic foodstuffs into our guts as a replacement for real food.

Slightly turned off by the zealot factions of the paleo and primal community who seemed to spend all their time arguing amidst the message boards about insignificant minutiae, I decided to keep my distance and instead just use what Mark prescribed in terms of moderation: eat real food 80% of the time and use the other 20% as wiggle room.

An important part to this equation for me was psychologically deciding to play the long game.

Up to that point, I'd been incredibly impatient with everything in terms of seeing results. If I didn't get immediate results, I'd trash it and move on to the next thing.

But this was exhausting, and I was beginning to realize that this approach would not serve me well over the long term.

So I made a decision to not rush things.

This is my health, and if it takes a couple years to fix, so be it.

I'm more than willing to devote a couple years of very slow progress to cultivate a level of endocrine health that will last me a lifetime.

Part of this decision - a huge, crucially important part of this decision - involved completely ditching my current form of training.

Anything and everything that had to do with endurance training was thrown out the window. The more reading I did about how the body works, the more I began to realize how detrimental chronic endurance training is for endocrine health (and this realization would only be continually supported as I watched my sister, a national champion on the track, steadily run herself into the emergency room several years in a row).

Training changed big time.

What started off as just walking 3-5 days per week, turned into some bodyweight resistance exercises and a day of sprints.

Slowly over the next year or so as I lost body fat and felt more athletic again, I began taking calisthenics more seriously. After a short bout of time in the weight room, I decided my time was better spent focusing on calisthenics.

They were more fun, and got better results.

The exact way that I figured out how to train to optimize testosterone production is detailed later on in this program, but long story short... I realized that I could train far less, and have far more fun in the process, than I used to - and get much better results.

So after graduating from college, I moved to New York City with a couple friends where we ran a startup company we'd founded out of our dorm rooms. While in the city I taught myself how to muscle up after watching some street workout guys in the park and being fascinated by their raw power on the pull-up bar.

At that point, my testosterone was in the 600's.

I got it tested six months after learning to muscle-up and it was around 1200. I was blown away.

Since then I've been holding strong at a high testosterone level and feel confident that I'll be able to maintain it indefinitely. Because I know exactly how to manipulate it.

What began as a journey to improve my symptoms naturally, turned into a discovery of a process that could potentially help thousands of other guys alleviate their low testosterone problem.

No more pills, no more gels.

Here's the kicker: I still have my brain tumor. I never got it removed. The nature of the tumor is that it blocks the secretion of certain hormones in my pituitary gland, testosterone production suffering as a result.

But somehow, this process loosened its grip, and rendered it ineffective. Pretty freakin' cool.

We'll catch a glimpse later on in this book as to how that may have been possible as we examine the certain feedback loops involved in this process.

But moral of this story: if I can raise my T, then you can too.

I spent several years figuring out the information that follows in these pages, and have now compiled it into a replicable process so you don't have to suffer these symptoms any longer.

If I could ask one thing from you, it would be this: please put what you learn into action.

None of this information or those years of self-experimentation will be of any use if you do not actually put this information into action in your life.

Get results.

You'll be much happier because of it. And one of the best things is this: this is an inherently manly program. You won't be asked to eat weird things or do strange exercises while wearing yoga pants.

And while this is biohacking at its finest, you also won't be asked to ingest any pills or hook wires up to your head. You don't need any expensive equipment or unorthodox training methods.

The most effective things I did were stupidly simple. And free.

I learned how to train (I never even bought a gym membership).

I learned how to eat (hint: If you eat meat, you're going to love this).

And I learned how to live.

Combine these three pillars into an actionable plan and you've got yourself a one-way ticket to high testosterone.

So let's do this thing.

glossary of common terms

Androgen Generic term for any compound that controls the development of male characteristics in vertebrates by binding to androgen receptors.

Circadian Cycle Endogenous biological rhythm that oscillates at around 24 hours.

Cortisol A hormone released in response to stress or low levels of glucocorticoids.

Enzyme Rate-limiting molecules that act as catalysts to many biological reactions and metabolic processes.

Estrogen The primary female sex hormone.

Free Testosterone Testosterone that is unbound by a protein.

FSH Follicle stimulating hormone; one of the gonadotropins synthesized in the anterior pituitary and responsible for reproductive regulation and maturation.

Growth Hormone Peptide hormone that stimulates growth.

Glutathione Potent endogenous antioxidant that prevents damage to certain tissues by fighting free radical exposure.

Hormone A chemical messenger that transports a signal from one cell to another.

Hypothalamus Part of your brain that links the nervous system to the endocrine system, among many other functions.

Insulin Peptide hormone that regulates carbohydrate and fat metabolism in the body.

Intermittent Fasting Abstaining from caloric consumption for a short period of time.

Leptin Hormone that plays a key role in appetite, hunger, metabolism, and behavior.

LH Luteinizing hormone; acts synergistically with FSH; communicates with the Leydig cells in the testes to signal production of testosterone.

Neurotransmitter Chemical that transmits a signal from one neuron to another across a synapse.

Pituitary Brain region responsible for releasing hormones into the endocrine system. The master endocrine gland.

Prolactin Peptide hormone (PRL) with important roles in reproductive and immune functioning.

SHBG Sex hormone binding globulin; protein produced in the liver that binds to testosterone.

Testosterone male sex steroid hormone.

learn

introduction to testosterone

the endocrine system

If you're experiencing any of the following in your daily life, your endocrine balance needs some attention:

Irritable bowel syndrome, fibromyalgia, chronic stress, anxiety disorders, bipolar disorder, insomnia, borderline personality disorder, excessive fat/muscle gain/loss, post traumatic stress disorder, alcoholism, attention deficit, chronic fatigue syndrome, burnout, overtraining, major depressive disorder, loss of sex drive, low testosterone…

What is the HPA axis, and why should you care?

Philosophically, I believe we should operate upon solid principles before worrying about details. Most people take the opposite approach, unfortunately.

The outcome is that they do not see results, or their results are transient. Then they wonder why. The only way to understand the why is to take the time to learn the underlying system of principles upon which the details rely.

Everyone reading this book should, at worst, have a basic understanding of what the HPA axis is and why it is so important to your everyday health, and at best, a thorough understanding of the neurobiology that underlies the important reactions and feedback loops within it.

This chapter gives you the scoop.

An understanding of the HPA axis will equip you with the principle-based knowledge that'll serve as the most important tool in your toolbox as you move forward with balancing/optimizing your endocrine system - which, in turn, will lead to lower body fat, increased muscularity, and a heightened sense of well-being.

The HPA Axis is the Hypothalamic-Pituitary-Adrenal axis. It is the line of action between the hypothalamus, the pituitary gland, and the adrenal glands.

The hypothalamus sits at the 'top' of the axis. It is the brain substrate that serves a primary purpose of linking the nervous system to the endocrine system via your pituitary gland. The hypothalamus is roughly the size of an almond and you can find it in all vertebrate nervous systems. It sits just below the thalamus (hence, the hypo-) and above the brainstem.

The direct aim of the hypothalamus when it releases neurohormones is to either stimulate or inhibit the actions of the pituitary gland. A few functions that are more commonly attributed to its control are hunger, sleep functioning, fatigue, thirst, & circadian cycles.

As you can probably assume from the magnitude of regulation that it's responsible for, the hypothalamus is extremely important in terms of creating a homeostasis (balance) within your endocrine system - and therefore entire body.

Symptoms of an unhealthy hypothalamus include inexplicable hunger, insomnia, weight problems, dehydration/hyponatremia, excessive fatigue, etc...

The pituitary gland is next in line. It is shaped like a pea and sits right below the hypothalamus, basically at the center, near the base of your brain.

It is also referred to as the hypophysis but, since I don't even know how to pronounce that correctly, we're just going to use 'pituitary' here.

It is divided into an anterior and posterior lobe and is responsible for secretion of vitally important homeostatic hormones into your body.

The hormones that it releases are:

- *Growth Hormone (GH or HGH)*
- *Thyroid-Stimulating Hormone (TSH)*
- *Adrenocorticotropic Hormone (ACTH)*
- *Beta-Endorphin*
- *Prolactin (PRL)*
- *Luteinizing Hormone (LH)*
- *Follicle-Stimulating Hormone (FSH)*
- *Intermedins (MSHs)*
- *Oxytocin*
- *Antidiuretic Hormone (ADH)*

The next and final 'stop' in the HPA axis is the adrenal glands, which sit far from your brain, atop your kidneys. They are mainly responsible for releasing hormones - such as cortisol and the catecholamines - into your bloodstream in response to stress.

What are catecholamines (kat-eh-cola-meens)? Epinephrine and norepinephrine: more commonly known as adrenaline and noradrenaline.

Your adrenal glands are also responsible for the secretion of small amounts of androgens (male steroid hormones). The hypothalamus and pituitary gland also communicate directly with the testes (gonads) so this axis is sometimes referred to as the HPG axis as well.

While some testosterone is secreted by the adrenal glands, the bulk of it is secreted from the Leydig cells of the testes in men.

The pituitary gland is known as the 'master' endocrine gland.

The Basic Pathways and Feedback Loops

The HPA axis, as a whole, is incredibly complex. There are (very very smart) people who devote their entire lives to studying its effects on the human body & behavior (ie endocrinologists, neuroscientists, etc) who still do not understand everything, nor will they ever.

Keep in mind that I am making grossly simplified generalizations when I say that the HPA axis is responsible for not only the above functions, like regulating stress & secreting sex hormones, but also controlling your mood & emotions, your immune system, your energy metabolism, and very importantly - digestion.

In fact, this entire chapter is grossly simplified. But the point, once again, is not details for the sake of details, but to grasp a general understanding of how this all works.

However simplified the generalizations may be, just believe me that the HPA and HPG axis' are power players in these processes.

Neurons in the paraventricular nucleus of the hypothalamus synthesize and secrete vasopressin & CRH (corticotropin-releasing hormone). The release of these peptides stimulates the secretion of ACTH in the pituitary gland which acts to produce glucocorticoids (ie cortisol - synthesized from cholesterol) in the adrenal glands.

These glucocorticoids now act back on the hypothalamus to suppress any more release of CRH & ACTH. This is what we refer to as a negative feedback loop. It regulates itself when everything is healthy and working properly.

Keep in mind that the hypothalamus is only one of several targets in the brain for glucocorticoids. Stress hormones such as cortisol act on many different tissues and substrates within both your brain & your body - a big reason why keeping this feedback loop working properly is VITAL to maintaining a healthy body.

One positive feedback loop within the HPA axis that you should be aware of is the excitatory effect of the catecholamines (Epinephrine & Norepinephrine) on the pituitary gland to increase the production of ACTH and Beta Endorphins.

Remember that the HPA axis is not a self-contained unit - it spans much of the body anatomically but it is also influenced by other substrates in your brain and body, specifically those tied to sensory processing - both on the front end (ie eyes, ears, nose, mouth, skin) and on the back-end (ie amygdala,hippocampus, etc).

Basically what I am trying to say is that it is crucial, absolutely crucial, to have a well-functioning HPA axis in order to be healthy, get and stay lean, have good sex, and be happy.

testosterone

Pharmaceuticals are big business.

BIG business.

So I was absolutely not surprised when, a couple years ago, a pharmaceutical company named Abbvie jumped all over the somewhat recent trend of men experiencing low testosterone - packaging their 'solution' and branding the issue as an epidemic, conveniently funneling thousands and thousands of men into doctors' offices, where they were handed prescriptions for hormone replacement therapy solutions & gels (Androgel, to be precise).

Boom, billions of dollars.

So what happened to all of the men, most likely many of you reading this program right now, who are on HRT? Well, your testosterone levels are likely back in the 'normal' range, in many cases on the low side still, depending on where you were starting from. That's good, right?

Not exactly.

What happens if you stop using the gel?

Will your body naturally produce enough testosterone to keep your levels where they are?

Probably not.

So here's the situation: you're chained to rubbing an expensive smelly goo on your chest for the rest of your life - or at least as long as you care about getting a

boner.

That's no way to live.

The goo is a band aid. What we need to do is get to the root of the issue, learn and understand the cause of the malaise, then take action based upon what we know. That's the process I used several years ago to take my own T levels from basically nothing to way above normal - out of the medical reference range even.

The first thing the doctor gave me when I was diagnosed with the brain tumor (that was blocking testosterone production) was a prescription for Androgel. I took it for a few weeks, but decided to chuck it, and all of my other medications shortly thereafter, when I made the decision to uproot the problem directly and solve it with a natural solution. Best choice of my life.

That was a few years ago, and since then I've educated myself, then put that knowledge into action in my life. The results speak for themselves.

I'm very confident I will have high testosterone for my entire life because I now understand how to keep it that way. It will naturally decline with age, yes, but it will never reach the point of having to ever think twice about whether it's negatively affecting my life in any way.

Right now my well being is high. So is my morning wood.

(Couldn't resist)

I can put on muscle fairly quickly and stay at a low body fat percentage year round without any trouble. I sleep like a bear in hibernation every night and can grow a decent beard if I choose to. I always gain strength and power in training (actually an important cause of the high testosterone, more on that later on) and I'm pretty sure women can smell it.

Oh I also grew 2 inches in the meantime.

The task at hand for me at the moment is distilling this into a replicable process that you can use in your own life.

I'm a believer that things happen for a reason, and it would appear as though all the trouble I went through personally, and the years of self-experimenting, learning what works and what doesn't, then my decision to become a blogger, may have just led us all right to this moment. So yep, I think I was meant to share this knowledge with the world.

Know this: medications and gels are not your only option.

You also don't need to eat a dried tiger penis (apparently a common practice in ancient Chinese herbalism |o_o|).

You can naturally increase your testosterone and growth hormone and then sustain your levels without "assistance". It is a process, and will take anywhere between 6 months to 2 years most likely. But once you learn it and put it into action, you'll be set.

It's time to begin building the foundation.

Let's learn.

What is Testosterone?

Testosterone is the principal male sex hormone. An androgen.

It is found in both males and females, and acts anabolically. While females naturally produce small amounts of testosterone, and have far greater sensitivity to the introduction of additional testosterone into their systems, males, clearly, are where testosterone is most prevalent (7-10+ times the natural amount of females), and in whom higher testosterone is most often desired.

It is secreted in the testes of males, and ovaries of females, with small amounts also coming from the adrenal glands.

Androgens are steroid hormones, and can be produced naturally and synthetically. The presence of androgens in tissues that have androgen receptors promotes protein synthesis in those tissues, giving it anabolic influence.

Androgenic effects include much of what we consider to be human maturation, especially in sexual tissues/organs. For example, androgens heavily influence maturation of male secondary characteristics such as growth of the penis and scrotum, body hair, vocal sound depth, etc. Anabolic effects are characterized by things like muscle growth and strength, as well as bone maturation, increased density, and increased strength.

Testosterone gets to work, in both males and females, before we're even born and carries out its influence heavily first during the sexual differentiation process, then into infancy, prepubescence, puberty, adolescence, and adulthood.

T plays a role in many processes in the body, one of the more prominently known being spermatogenesis.

Without the presence of testosterone and/or the androgen receptor, spermatogenesis can't proceed past meiosis (ie. you can't produce sperm). In non-sciency terms, you're infertile.

So now that we know where testosterone is produced, let's venture a guess at what may be the cause of low testosterone production.

There are two common culprits, and they're medically recognized as primary and secondary hypogonadism.

The first, primary hypogonadism, is caused by deficient testosterone production in the testes. The boys aren't working properly.

The second, secondary hypogonadism, is caused by hypothalamic-pituitary irregularities. They regulate your endocrine system. So for example, secondary hypogonadism can be caused when a piece of this puzzle isn't functioning properly. I'm of the opinion that these processes (primary + secondary hypogonadism) do not operate independently, as evidenced by the strong influence of the hypothalamus and pituitary gland on the gonads directly.

So in the end, it all comes back to brain health.

And therefore... gut health (if you haven't yet read the No Gym, Perfect Body book that I give to all subscribers on NoGym.net, you should. I go into some more detail about gut health and why it's so important.)

Your gut is your second brain. And you can directly influence its health with what you put into your body for nutrition.

NOW we're getting somewhere.

You'll recall that testosterone is produced in the testes by cells called Leydig cells. The average plasma concentration of testosterone in human males typically falls between the range of 200 – 1000 ng/dl. In terms of timeline vs plasma concentrations over a lifetime, T levels rise sharply during adolescence, peak in a man's 20's, then begin a slow decline with age.

While its most potent and widely recognized effect on the human male body is its influence over the growth/development of sexual tissues, your testosterone level is also a good indicator of lean body mass (ie. muscle) potential, with the right stimuli. Elevated testosterone levels will increase red blood cell production, bone density, sugar uptake into muscle tissue, muscle glycogen storage, and protein synthesis associated with muscular growth.

The Feedback Loop

The cascade of events leading to testosterone production begins in the hypothalamus with the release of GnRH (gonadotropin releasing hormone) which acts on the pituitary to produce two hormones: LH (luteinizing hormone) and FSH (follicle stimulating hormone). These are the gonadotropins.

Once in the bloodstream, LH makes its way to the testicles where it exerts its influence on the Leydig cells, triggering a series of events that turns cholesterol into testosterone.

As testosterone levels increase, LH production & transport slows. A negative feedback loop.

The body and brain are communicating constantly in order to regulate important processes. This is one of countless feedback loops (there are many positive feedback loops as well) in the human body.

With this negative feedback loop, the brain can constantly keep hormone levels in check – in this case, testosterone, LH, FSH, and GnRH – under normal, healthy circumstances. When a problem arises anywhere on this pipeline, be it from a tumor, traumatic stressor, or summative build-up of small, unnoticeable toxic stress (super common) – not only is everything downstream affected, everything period is affected.

Because it's a loop.

You'll notice that testosterone doesn't only linearly exert its influence back on the hypothalamus alone, it can also work directly back on the pituitary (essentially "skipping" a step) if your body is looking to quickly regulate gonadotropin release.

When this little system is working properly, everything's good in the 'hood. When something goes wrong down the line is when we run into noticeable issues (more on that later).

FSH, the other gonadotropin, is chiefly responsible for stimulating (or regulating) production of sperm in the Leydig cells in the testes.

At this point we understand that testosterone production is regulated by the brain, namely the hypothalamus and pituitary, via a handful of powerful hormones. And it's synthesized after a number of intermediate steps, from cholesterol in the Leydig cells. And this process is all tied together in a negative feedback loop.

Now it's produced. What happens next?

When testosterone is released into the wild – your bloodstream – it is actually entering a molecular game of 'tag,' to put it metaphorically.

A carrier protein named SHBG, or Sex Hormone Binding Globulin, is released from the liver, and SHBG is 'it.'

SHBG's role is to regulate the level of freely circulating testosterone in your bloodstream. So when it binds a testosterone molecule, that testosterone cannot effectively enter and exert its influence on a cell.

So the more SHBG is in the bloodstream, the fewer testosterone molecules actually reach a cellular target.

This isn't inherently a bad thing, it's just the way things work.

Another negative feedback loop meant to regulate your endocrine function.

However, now I hope you're beginning to realize the sheer amount of self-limiting processes that occur along the line in this cycle… and none of our testosterone has actually had an effect on anything yet!

With SHBG in this role, we now understand that testosterone levels and SHBG levels are inversely correlated: the more SHBG in your system, the lower amounts of free, active T.
Again, if something small is affecting ANYTHING along this pathway, you're likely going to experience an issue, manifesting itself as lower-than-optimal testosterone (and related hormone) levels.

For example, you may have very high levels of free, circulating testosterone, but with an imbalance in SHBG production, much of that free T won't reach a target. That sucks. We'll discuss free testosterone and total testosterone further in a

little bit.

cortisol

Cortisol gets a lot of play in the blogosphere, especially in the fitness realm.

“Keep your cortisol low,” is the mantra.

But how many of us actually know what it is, much less understand the way it works? How can we expect to keep it at a healthy level if we don’t even understand what we’re trying to manipulate?

Well, let’s address that issue together right now.

After reading this chapter, you will no longer be one of the blind lemmings following what you hear proclaimed by gurus and mass periodicals. Instead you’ll be capable of making decisions based on your innate knowledge of your own body and lifestyle coupled with a general understanding of how the system you’re looking to manipulate actually works.

Let’s begin. What is cortisol?

Cortisol is a glucocorticoid, a class of steroid hormone, released from the adrenal cortex. Its release is regulated by the hypothalamus (in a similar series of steps as we saw with testosterone) and the influence of CRH (corticotropin-releasing hormone).

The hypothalamus uses CRH to signal the anterior pituitary to release another hormone called ACTH (adrenocorticotropic hormone) which enters the bloodstream and acts on the adrenal glands downstream to begin production, and subsequent release, of cortisol (which is also known as hydrocortisone).

What does it do?

Baseline levels of cortisol are required for healthy functioning of the body. **Chronically elevated levels are what we need to look out for.** You'll understand why when you understand what it does.

Cortisol plays a key role in a process called glycogenolysis, the breaking down of muscle glycogen in the liver and muscle tissue, by triggering the activation of an enzyme called glycogen phosphorylase. This entire process is triggered by the presence of epinephrine and/or norepinephrine (E/NE), also known as adrenaline and noradrenaline.

E/NE are released in response to stress (commonly associated with the 'fight or flight' response). This little process is why cortisol is also associated with stress.

Under times of stress, the body needs to have a mechanism of action for allocating resources away from less important things, such as the immune system, and toward more immediately important processes such as breaking down muscle glycogen.

Evolutionarily this is important because it allows the human under pressure or external threat to quickly evade danger.

Cortisol is responsible for this.

However, now we can see why elevated levels of cortisol can be a bad thing. In terms of muscle wasting, chronically elevated cortisol will lead to a catabolic process known as proteolysis.

It's also known to suppress lipolysis (breakdown of fat tissue) and decrease bone formation (by reducing calcium absorption in the intestines and facilitating an exchange of potassium for sodium in the cells).

Hopefully you can see the trend: it appears to act antithetically to testosterone.

An elevated cortisol level also facilitates insulin resistance by decreasing the amount of glucose transporters that get shuttled to the surface of the cell membrane, and inhibits collagen formation which subsequently **inhibits protein synthesis** due to a decreased ability of muscle tissue to uptake amino acids.

Cortisol also suppresses the immune system via a negative feedback effect on a

group of cytokines (interleukin-1) which disables production of T-cell growth factor. T-cells are known to actually secrete a "modifying factor" (GRMF) that regulates cortisol release, so by disabling T-cell production, cortisol has less of a checks & balances system to answer to (to anthropomorphize it all).

In terms of brain damage, chronically elevated cortisol levels can damage cells in the hippocampus, creating a memory-deficit effect. While it works hand-in-hand with E/NE to create "flash bulb" memories (short, highly emotionally salient memories under stress), at chronically high levels, it will also severely hamper your ability to recall basic information.

This is why you feel "brain fog" during prolonged periods of stress at work or in family life and you may feel absent-minded and forgetful. Cortisol is damaging your hippocampal neurons, inhibiting your ability to recall information you've already "stored".

Okay, now that the doomsday picture has been painted, let's take a look back at the process briefly and identify where we may want to exert some influence in order to control cortisol production, keeping production at a healthy level.

My vote is for the pituitary gland. Remember, the pituitary secretes ACTH into the bloodstream to signal to the adrenal cortex to secrete cortisol.

So now that we understand quite a bit about cortisol itself, and possess a basic understanding of the system, let's take a look at the interplay between cortisol and testosterone.

Recall that when cortisol is released in response to stress, it triggers the reallocation of resources away from other body processes. One effect of this is actually a decrease in testosterone. They work inversely.

Under normal conditions this is completely fine; processes such as spermatogenesis are low on the totem pole compared to jumping out of the way to avoid getting smacked by a speeding taxi, for example.

Once the external stressor is gone, the body restores its homeostasis, lowering cortisol levels and increasing the testosterone levels back to normal.

However, under the influence of chronically elevated cortisol levels, that

homeostasis is not restored. Testosterone is chronically suppressed. This manifests in all manner of the symptoms that we commonly associate with today's "low T" epidemic.

growth hormone

Now let's talk about growth hormone.

First, what is it?

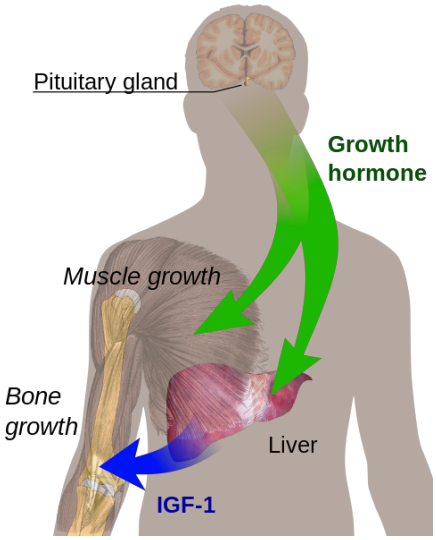
GH (or HGH) is a peptide hormone secreted from the anterior pituitary and regulated by GHRH (Growth Hormone Releasing Hormone) and GHIH (Growth Hormone Inhibiting Hormone) – both secreted from the hypothalamus.

These two 'neurosecretory' hormones actually get released into the blood surrounding the pituitary and, in combination with physiological balance (heavily influenced by things like sleep, nutrition, exercise) they act upon the pituitary gland to initiate secretion of GH in a pulsatile manner.

Hopefully by now you're noticing a trend in how this works in terms of the HPG (Hypothalamus-Pituitary-Gonadal) axis. They also use pretty self-explanatory names for these hormones, which is nice.

Growth hormone is responsible for facilitating cellular growth, regeneration, and reproduction in humans and its effects are anabolic in nature. The bulk of your GH release occurs while you're asleep, with around half of it occurring between stages 3 and 4 NREM sleep. During the day it's been found to secrete in surges every 3 to 5 hours.

Here's a nice little sketch of the general path of action GH can take.



There are multiple ways to manipulate your GH secretion. Even just from what we've just learned we can easily see that by influencing the balance of GHRH to GHIH we'd be able to stimulate more GH secretion.

Those neurosecretory hormones are also heavily influenced by the physiological downstream effects your body experiences from sleep, nutrition, and exercise – so those are some other things we'll explore.

Mostly because they're the easiest to control and measure.

Ghrelin is another lead. It was found to be a ligand for the growth hormone secretagogue receptor back in 2000, I believe… which in layman's terms means its presence can stimulate GH release.

A couple other natural GH release-stimulators are deep sleep, L-DOPA, fasting, and nicotinic acid (vitamin B3).

On the flip side, common GH inhibitors are 1. high circulating levels of GH itself or IGF-1 (due to the negative feedback loop) 2. glucocorticoids (ie. cortisol) 3. DHT.

Elevated (or even just normalized) levels of GH will make it much easier for you

to build muscle (via increased ability to synthesize proteins), drop fat (via promotion of lipolysis), and spare glycogen (via reduced uptake of glucose in the

liver).

So it's a good thing to have.

nutrition

body fat

What does your body fat percentage have to do with your testosterone levels?

It is, in fact, one of the more important variables in the testosterone equation. Below a certain level of body fat, which in men tends to be sub 8-9% (but there is some variability, depending on age, training maturity, genetics) testosterone levels drop.

In competitive bodybuilders we see a drastic decrease in testosterone levels (even when many of them are on drugs) in the final weeks before the show as they reach sub-7% body fat levels.

This is the body's natural response to attempt to handle the stress associated with unnaturally low body fat levels by reallocating energy away from less vital processes like reproductive capabilities and over toward baseline functioning of vital organs and processes.

Ultra low body fat levels also tend to take a considerable amount of calorie restriction to reach, and low calorie diets hit testosterone levels hard as the body struggles to leech the necessary nutrients from the limited food source.

However, I'd be curious to see n=1 tests run on men who have reached sub-7-8% body fat levels slowly over the course of many years via a slight caloric deficit, as opposed to most data we have that measures less longitudinally, looking mostly at test groups over the course of a mere 12-16 weeks of intense calorie restriction, or bodybuilders who in fact, only drop ultra low in calories and spike their training intensity in the final 12 weeks before competing in a show.

Longitudinal data over the course of many years in experienced trainees who do not yo-yo in body fat levels but instead either maintain or slightly decrease body fat every year would be a far more interesting look at the human body's

capabilities in terms of endocrine function adaptability.

I would posit a guess that guys who train for years and very slowly decrease body fat through calorie and carbohydrate cycling and/or small deficits of 10-20% over time would develop the capacity to support normal testosterone levels naturally, at 5-8% body fat.

Low body fat is only one side of the coin when it comes to adipose and testosterone. The other side is far meatier (or flabbier), and far more relevant to most people reading this guide.

Body Fat & Testosterone Production

To put it simply, testosterone (both free and SHBG and albumin-bound) levels correlate inversely with measures of insulin resistance (insulin, C-peptide, and HOMA-IR) and body fat levels.

And the inverse association between testosterone and insulin resistance is mediated by adipose tissue, and independent of SHBG.

To put it in even simpler terms, the more body fat you have, the less testosterone you will naturally be able to produce.

So if you are overweight (or skinny fat, with >15% body fat in men), the single best thing you can do for yourself in terms of naturally optimizing your testosterone production is lose body fat. It really is that simple.

However, dropping that body fat may not be an easy task. You need to train correctly and eat the foods that will nourish your endocrine system, as opposed to crash dieting down, which will also lower your T levels considerably.

Do the correct training and eat in a moderate deficit of around 10-20% to allow for minor, non-stress-inducing endocrine adjustments over time.

If you have high levels of body fat, your endocrine system is suffering. It is nowhere near as healthy as it could be. However, you must realize that this took time to achieve. You didn't screw it up overnight so don't expect to fix it overnight either.

Luckily you're holding this program, and I've laid out how to train and eat anyways, so just go read those chapters for a better idea.

In terms of regional versus total body fat (ie. belly fat versus full body fat), the research is somewhat conflicting and inconclusive. Some studies find total body fat levels to be a better inverse correlate to testosterone levels, and some find regional abdominal fat levels to be better. However, the overall body of knowledge on the subject would indicate that they are both decent correlates.

So while abdominal body fat is a noticeable warning indication of compromised ability to produce natural testosterone, so is total body fat percentage.

Moral of the story: lose body fat to increase testosterone, regardless of where the fat tissue is concentrated.

Let's talk about cortisol here for a second...
Low levels of androgens are linked to central adiposity in men, and a high risk marker for Type-2 diabetes. Testosterone administration has been shown time and again to decrease intra-abdominal adiposity and increase insulin sensitivity over time.

Another important thing to note: an overall and predictable increase in cortisol levels occurs in overweight and obese individuals, as well as an increased sensitivity to cortisol. This means you'll be more stress-reactive the fatter you get, which is a bad thing.

The decrease in insulin sensitivity and glucose tolerance associated with an increase in cortisol levels is well-established. Muscle tissue rapidly becomes insulin resistant, especially the insulin-sensitive red muscle fibers (ie. glycogen synthesis becomes insulin resistant). And increased activity in the CRF-ACTH-Cortisol axis will inhibit hypothalamic secretion of gonadotropins (ie. testosterone precursors).

So to paint the doom-and-gloom picture for you in laymen's terms, increased cortisol makes it easier to gain fat, and as you gain fat you become more insulin-resistant which perpetuates cortisol circulation so you gain more fat. You also compromise your ability to properly use and store muscle glycogen, giving you further issues with glucose and insulin regulation.

You also increasingly compromise your brain's ability to secrete the hormones that trigger testosterone production.

Long story short, the more you reinforce stressful behaviors that increase body fat (eg. lifestyle and job stress, overeating, insufficient exercise, psychological stress, processed shit diet, etc) the worse your life is going to get.

The good news (especially if you're frequently stressed out, especially after reading that): lowering your body fat will increase your ability to handle stress and decrease the amount of circulating cortisol in your system, which will in turn make it easier to continue losing body fat. It's a positive feedback cycle.

I repeat: lowering your body fat percentage is the single most important thing you must do to naturally optimize testosterone production (not to mention nurture well-being in general).

cholesterol

Diet plays an enormous role in natural testosterone production.

The most misunderstood, but vitally important, molecule in your diet is cholesterol. This chapter will set the record straight: what is it, why should you care, how can you optimize your cholesterol intake, etc.

First off, if you were one of the millions of people duped into believing that a low cholesterol diet was healthy - I'm sorry. By lowering, or even eliminating dietary cholesterol, you were robbing your body of optimal physical, psychological, and cognitive functioning.

Cholesterol plays a role in countless processes in your body, from acting as a precursor to steroid and stress hormones, to insulating neurons, building cell membranes, producing bile, and metabolizing fat soluble vitamins.

Given its crucial importance, cholesterol is highly regulated by the liver via a feedback mechanism that ensures our body gets the amount it needs. This amount is typically around 1000-1400 mg/day, which means if you consume the US' dietary recommended amount of 300 mg/day, you leave your body to pull upon other resources to synthesize the remaining 700-1100 mg it needs every day.

Eat more eggs.

And if you consume an excess of dietary cholesterol one day, your liver continues to regulate the production process by slowing endogenous production to offset the dietary increase.

So what's the deal with everybody blaming cholesterol for causing atherosclerosis?

The following passage by Mark Sisson on his blog MarksDailyApple.com summarizes the situation perfectly - so perfectly that I cannot try to put it better myself:

"*Heart disease took off in the early part of the twentieth century, and doctors frantically searched for the cause throughout the next several decades. Tests in the fifties initially showed an association between early death by heart disease and fat deposits and lesions along artery walls. Because cholesterol was found to be present in those deposits (of course it would!) and because researchers had previously associated familial hypercholesterolaemia (hereditary high blood cholesterol) with heart disease, they concluded that cholesterol must be the culprit.*

In fact, what happens is that in response to an inflammatory situation, the body uses cholesterol as a "band-aid" to temporarily cover any lesions in the arterial wall. In the event the inflammation is resolved, the band-aid goes away and repair takes place. No harm, no foul. Unfortunately, in most cases, the inflammation proceeds, the cholesterol plaque is eventually acted on by macrophages and is oxidized to a point at which it takes up more space in the artery, slows arterial flow and eventually can break loose to form a clot. And all this time the cholesterol was just trying to be the good guy!

Blaming cholesterol for all this is like blaming a cut finger on all the band-aids you have lying around your house."

So what's the real cause of heart disease?

Inflammation caused by processed sugars that exacerbates LDL infiltration of the endothelium.

LDL cholesterol has been shown to rise in direct correlation with an increase in sugar-induced inflammation. It is then oxidized by the free-radicals in the inflammatory milieu. Trans fats can also play a role in this oxidation.

How do we combat free-radicals? A diet high in antioxidants.

This is grossly oversimplified, but for our purposes it's what you need to know.

Cholesterol is not bad at all - in fact, it is VITAL for life. Is dietary cholesterol the same as endogenous cholesterol? No. But the former does affect the latter, and a diet rich in dietary cholesterol from sources such as meat and eggs is going to nourish your body and brain in a way that a low cholesterol, grain & sugar rich diet will not.

Cholesterol is potentially the most complicated topic that we'll be discussing in this program. With that in mind, I want to keep it as simple and to-the-point as possible for maximum actionable takeaway.

Cholesterol, among the many other things mentioned above, acts as a precursor to testosterone. In short, it is converted to progesterone, then testosterone. What you need to know is this: a diet rich in cholesterol and low in sugar will promote testosterone production, especially when combined with resistance training. The best type of resistance training to undertake is discussed in the "training" section of this program, but according to studies, almost any type of resistance training protocol will work, you'll just see a varying degree of effectiveness along the spectrum of program design.

Examples of foods that you should consume as the best possible sources of dietary cholesterol are outlined further in this nutrition section, but in a nutshell you want to focus on meats, eggs, and high quality dairy while also supplementing with fruits and vegetables that are high in antioxidants, to combat any free radical damage caused by inflammation.

It's a damn simple approach. And it works.

If you want more detail, read on as we discuss the role carbohydrates and intermittent fasting play in this nutrition equation...

intermittent fasting

**Special thanks to two men in particular, Martin Berkhan and Brad Pilon, for laying the foundation of much of the information in this chapter in terms of reviewing the literature on intermittent fasting, especially with respect to its effects on the endocrine system. You can find their work at http://leangains.com and http://eatstopeat.com, respectively.*

I would like to begin this very important chapter by saying that intermittent fasting has been, hands down, the most useful tool in my tool box over the past couple years when both dropping body fat and increasing testosterone levels naturally.

Even in the absence of perfect nutrition (nobody can, or should, eat squeaky clean all the time) and less-than-ideal sleeping conditions and lifestyle stress situations (living in NYC and sleeping on a couch for a year on noisy 14th street, for example, while under extreme stress with a venture-funded mobile tech startup = stress to the max), intermittent fasting became my go-to daily form of hitting the reset button with my physiology.

And over time, I truly believe that IF played a major role in bringing my health from mediocre, to very solid.

What is intermittent fasting?

Intermittent fasting is quite simply abstinence from caloric consumption for a short period of time.

During this fasting period, an individual can consume non-caloric beverages without negatively impacting the fast, but no foods or caloric liquids should be consumed, or the individual leaves the fasted state.

Fasting has been used for centuries as a medicinal exercise in humans, and is a natural response for many animals during times of sickness or healing.

Arguing for or against the nature of fasting is not within the scope of this program. I will instead assume that you are reading this in order to learn more about how to increase your testosterone naturally, and therefore I'll lay out the myriad benefits of IF for doing so.

Not only does intermittent fasting provide a means to decreasing body fat, either by easily facilitating a caloric deficit without the negative hormonal side effects of calorie restriction or by facilitating some of its own fat-burning influence in the absence of a calorie deficit, making body recomposition more effortless, but it also boosts testosterone by influencing expression of key pituitary and satiety hormones including GnRH, LH, insulin, and leptin.

The research on intermittent fasting in the scientific literature is either, or both: 1. woefully nascent 2. non-applicable to both humans and/or us, fitness-conscious individuals.

Most short-term fasting studies are conducted in animals like monkeys, rats, or cows, and are carried out with methodological 48 - 72 hour fasts. For our purposes, this is considered a long-term fast, especially because most humans will never undergo a fast over 48 hours. And the results are non-applicable to us.

Almost all of these studies find the suppression of testosterone and an increase in circulating cortisol, as if that was a surprise. Between 24-48 hours of fasting, depending on individual variance, most humans will have an acute stress response to the lack of feeding. Hormones such as cortisol, insulin, growth hormone, and testosterone will likely be affected.

However, for fasts under 24 hours, the benefits are myriad, and this acute stress response is less likely.

For example, in obese men short-term fasting was shown to increase LH production after just an overnight fast. While the LH increase in this case did not directly lead to a noticeable increase in testosterone levels in these men (it was, remember, a mere overnight fast) the increase in LH was promising enough for the same researchers to perform tests in nonobese men.

In the nonobese men, the results of a mere overnight short-term fast were staggering: a 67% increase in LH response and a 180% increase in testosterone. With this in mind, doing a short-term fast daily may have profound, almost immediate effects on your endocrine balance, especially because LH pulsing needs to spike regularly in order to have a noticeable effect on your overall T levels, something that regular daily intermittent fasts can have a positive effect on.

In terms of these results, short-term fasting appears to affect men differently based on their level of body fat, with normal, nonobese men seeing a rapid rise in LH, then testosterone following a short fast.

However, in obese men, the rise in LH does not seem to affect testosterone levels, which may be an indication that IF induces a strong enough stress response in this subgroup of men to effectively negate the LH increase before it triggers testosterone production or because it is not strong enough to overcome the powerful estrogenic influence exerted by the excessive levels of body fat.

Testosterone has been found to be positively correlated with insulin sensitivity, which also reinforces the idea that body fat levels matter in terms of healthy testosterone levels, with normal and fit body fat levels exhibiting improved insulin sensitivity over overweight and obese individuals.

This fact also sheds a bit of light on when we should fast during the day.

For years I've been a proponent of skipping breakfast. Since reading Martin Berkhan's work and realising that breakfast was not a physiologically necessary, but more a socially expected, ritual, I began experimenting with life sans my morning sustenance. And boy did dieting get easier.

In Martin's article on Leangains.com entitled, "Why Does Breakfast Make Me Hungry?" he sheds a little light on why most semi-fit individuals experience hunger relatively soon after eating breakfast, and why skipping breakfast is indeed preferable for your hormonal functioning, not to mention diet adherence.

The body's circadian cycle has a natural cortisol spike shortly after waking, and this happens to be the time most individuals eat breakfast as well. With fit, or somewhat fit, individuals, the insulin spike with the food intake, along with an

already high insulin sensitivity, and the high levels of circulating cortisol at this time of day leads to a rapid drop in blood glucose shortly after consumption.

The quick and possibly lower-than-normal blood glucose drop triggers the feeling of that “false hunger” within minutes to hours after that meal, so by mid-morning for most people.

By skipping breakfast, you are regulating your blood glucose levels, insulin, and cortisol during the period of the day in which they are most sensitive, and can have profound immediate effects on your body.

You are also allowing your body time to burn additional fat for fuel and rid itself of minor toxins before it needs to allocate energy to focus on things like digestion and glycogen synthesis.

The hormone leptin is also effectively regulated by intermittent fasting, and has been shown to be inversely correlated with testosterone levels and BMI in men, which means with a regular IF regimen, individuals can control yet another hormone that could potentially exert an influence over testosterone production.

Leptin is more popularly known for its major role in regulation of appetite and energy balance, but it is also involved with linking energy stores to the reproductive system.

Leptin is secreted by the fat cells and plays an important role in reducing food intake and increasing energy expenditure. Recent rodent studies have also linked it to providing metabolic information to the reproductive system, both in females and males. In male mice, leptin treatment elevated FSH levels and increased seminal volume.

Leptin and testosterone levels are inversely correlated, with a rise in leptin resulting in a fall in testosterone and vice versa. Because of this, males have naturally lower levels of leptin than females. This gender difference suggests that gonadal steroid hormones may be potent regulators of leptin levels.

Because of the added variable of body fat levels being so intricately tied to both leptin and testosterone levels, it’s very difficult to make conclusive statements about the dance between the three. Lean men have lower leptin levels, naturally, than overweight men (because leptin is secreted from adipocytes). We

also know that lowering your body fat, in general, is one of the easiest ways to naturally increase your testosterone. These are all intricately tied together.

Intermittent fasting decreases leptin levels during the fast in men, and boosts them at refeeding, operating in a peaks and valleys fashion. During the fast, leptin also has less power over regulation of the catecholamines epinephrine and norepinephrine which has positive implications for fat loss during the fast.

Intermittent fasting also increases levels of a hormone called adiponectin, which, along with leptin, is regulated by adipocytes, though adiponectin levels are inversely correlated with body fat levels, unlike leptin. This increase in adiponectin during the fast helps improve insulin sensitivity. Adiponectin is so powerful, in fact, that it's been shown to reverse insulin resistance in mice.

There are three popular methods for intermittent fasting that I recommend:

1. The Leangains Method
2. The Eat Stop Eat Method
3. The "Just Skip Breakfast" Method

Yes, other protocols exist. However, these three are the most realistic in terms of developing healthy lifestyle habits. Very few people can, or should, do things like alternate day fasting or 48 hour fasts. For the modern man or woman, with a job, kids, a family, social obligations, a sane mind, etc these are just not viable options.

So in this program, I recommend you fast on one of the above three protocols.

1. Leangains: Leangains is Martin Berkhan's style of intermittent fasting, and arguably the most popular and well-respected intermittent fasting protocol in the fitness world. He backs up his advice not only with solid research, but also with outstanding results from both his clients and himself.

He maintains low body fat year-round by eating and training on his protocol.

Any summary of Leangains is bound to do it an injustice if you haven't yet read the site itself. But in a nutshell, LG style of IF revolves around the 16/8 eating schedule.

- 16 hours fasting
- 8 hour feeding window

It's quite simple. For more information on DIY solutions in terms of macronutrient cycling and training protocols, which are unrelated to this program but very well-done nonetheless, you can look here and at Andy Morgan's great site here.

2. Eat Stop Eat: ESE is the brainchild of Brad Pilon, a proponent of flexible dieting and using intermittent fasting as a tool to make reaching low body fat levels both easy to attain and maintain.

The ESE method is also quite simple, but at the risk of not doing it justice in this concise summary, I highly suggest you check it out for yourself at Eatstopeat.com.

In a nutshell, ESE involves two 24-hour fasts per week as metabolic resets and fat-burning stimuli.

For example, during a normal week, an individual could eat regularly every day except Wednesday and Saturday, electing instead to undergo a 24-hour fast.

If this protocol suits your personality or work/life schedule I recommend giving it a shot. Even one 24-hour fast per week will give you benefits.

3. The "Just Skip Breakfast" Method: This is the lazy man's method, and my protocol of choice.

Just skip breakfast.

Then resume eating around noon for lunch then have a dinner and possibly a night time meal, depending on your caloric goals for the day. It's very simple and doesn't require counting hours.

Most of the time you will end up on a schedule similar to the Leangains 16/8 protocol, but this includes a bit more flexibility, possibly at the expense of results

(ie. lower body fat), but that makes it a great lifestyle option.

To wrap things up on IF: use it as a tool to give you both lifestyle flexibility and a boost in your testosterone levels, especially when integrated into a solid training and nutrition strategy. You can train fasted or fed, they both work.

Regular fasting will also provide your body with a nice reset and potent fat-burning potential, which will, once again, aid in testosterone production and regulation of satiety hormones over time.

macronutrients

The macronutrient profile of the food you consume plays a major role in determining your hormonal balance.

And the best macro profile is probably not what you've been led to think.

Before we dive into further explanation, let's cover the basics first. What is a macronutrient? Macronutrients are the three large "macro" groups of nutrients (ie. substances needed for growth, metabolism, and other body processes) and are split into: fats, carbohydrates, and proteins, in terms of classification.

Each of the major macronutrients play a role in supporting the endocrine system and overall healthy functioning of the body.

So it should come as no surprise when we see research findings that illustrate potentially detrimental effects of eliminating an entire macronutrient group from an individual's diet.

Since this program is focused on testosterone, examining the research shows us:

1. Low carbohydrate diets are detrimental for testosterone optimization
2. Low fat diets are detrimental for testosterone optimization
3. High protein diets are detrimental for testosterone optimization

Much of the body of research on the subject of testosterone optimization and macronutrient composition of meals also focuses on adding the element of resistance training, so we can rest assured that a lot of the findings are pretty relevant to our goals and not just isolated, sterile results.

Carbohydrates

Your body's natural hormone levels are affected by the availability of certain macronutrients. When it comes to carbohydrates, a low blood glucose concentration stimulates a compensatory response from hormones like epinephrine, glucagon, and cortisol - known in this context as "fuel mobilizing hormones."

For example, one study found drastically higher levels of these hormones in subjects after consuming a low carbohydrate diet (11% CHO) compared to subject consuming a high carbohydrate diet (77% CHO).

Low carbohydrate (CHO) diets tend to have direct effect on the testosterone:cortisol ratio in humans.

Especially when undergoing athletic or fitness training (resistance or endurance), the body needs adequate carbohydrate to support glycogen synthesis and maintain blood glucose levels without putting extra stress on the body in the form of chronically elevated epinephrine and cortisol levels. This cortisol secretion occurs in an effort to maintain blood glucose through muscle proteolysis and amino acid oxidation, and has been found to increase similarly in response to a high protein diet as well due to neglecting adequate carbohydrate consumption on that regimen, which we will discuss further momentarily.

SHBG and cortisol binding protein levels are shown to decrease with moderate to high levels of carbohydrate consumption.

In one study that measured the effects of CHO consumption on the free testosterone:cortisol ratio over repeated days of training (as opposed to most studies which only look at acute bouts of training), the researchers found that the ratio substantially decreased in the low carbohydrate group, while the control group saw no drop or rise.

This is pretty telling for a couple reasons.

1. Remember, the fact that the ratio in high carbohydrate control subjects did not change in response to 3 consecutive days of hard training is important. This means that while overall acute levels of the hormones in the blood may fluctuate over time, their proportion to one another did not change, and that appears to be a direct result of the amount of carbohydrate in their diet (in this case 60%).

2. The low carbohydrate group was consuming 30% of their daily calories from CHO. In 'low carb' circles this would still be considered very high carb, yet even 30% saw a drastic decrease in the fTC ratio. This is telling. Imagine what a similar bout of training would do to an individual on a 10-15% carbohydrate diet (rough estimate of around 100g per day, the classic cut-off for being "low carb").

3. In the low carbohydrate test group, resting levels (tested three days post-training) found an additional 36.1% decrease in free testosterone and 14.8% increase in cortisol, indicating that not only do the effects of the training stimulus negatively impact the individual immediately following training, but they seem to accentuate over time, even in the absence of the stimulus, due to an inability of the diet to support the training and the increased effort of "fuel mobilizing hormones" to compensate.

So adequate carbohydrate consumption is necessary to support training, and in supporting training it is also supporting a healthy hormonal profile by preventing the chronic rise in cortisol, glucagon, and epinephrine.

However, processing this information on carbohydrates in isolation doesn't do us any good either. We need to be sure and view it in the context of a complete macronutrient profile, including fats and proteins in the mix.
Only then can we make an educated hypothesis about what the optimal "testosterone-supporting" macronutrient profile should be.

Protein

In the aforementioned study, researchers who examined two subject groups, one on a high carbohydrate diet and one on a high protein diet, with total calories and fat intake the same, found that the high CHO group had considerably lower cortisol levels, higher testosterone, lower SHBG levels, and lower cortisol binding protein levels, than the high protein group.

With fat intake and calorie levels being equal in both groups, this demonstrates not only the necessity of adequate carbohydrate intake to support testosterone, but also the potentially detrimental effects of neglecting one macronutrient group in pursuit of consuming an abnormally high amount of another.

Protein, especially in fitness-minded individuals, is almost always this macronutrient.

With the protein obsession prevalent in the fitness community today, it's entirely possible that the main reason many men, who are otherwise fit and appear healthy, still suffer from symptoms of low testosterone and chronic stress is that the constant pursuit of more protein in their diet (usually out of fear of muscle catabolism) is actually inadvertently sabotaging their endocrine health because the increase in protein consumption will always accompany a decrease in consumption of both fats and carbohydrates, arguably the two more important macronutrients for endocrine support.

As we'll see when we look at the research on fat intake and testosterone levels, dietary protein is possibly the least important macronutrient in terms of testosterone support. Therefore, it should be consumed at the absolute minimum level required for muscle support in training, and the remainder of the diet should consist of carbohydrate and fat - if testosterone optimization is your goal.

Luckily, at the end of this chapter, I propose a novel way to consume all of the adequate macronutrient levels while still maintaining a high training load and a lean, muscular body, as well as facilitating fat loss.

Fats

Three main dietary factors influence resting testosterone levels:

- Monounsaturated fat intake (MUFA)
- Polyunsaturated:Saturated fat ratio (PUFA:SFA)
- And protein:carbohydrate ratio

Since we've already discussed the protein:carbohydrate ratio, let's take a look at the fats, namely the impact of MUFAs, PUFAs, and SFA.

Research focused on the overall percentage of fat intake in the macronutrient profile has found lower fat diets to correlate with a decrease in testosterone levels. For example, in groups of test subjects, those on a 20% fat diet had significantly lower testosterone levels than those on a 40% fat diet, over the course of the study.

Studies in vegetarians, who are known to consume less SFA and have a higher PUFA:SFA ratio, also find similar results.

While the importance of overall dietary fat intake has been widely studied in terms of testosterone production, the breakdown of individual types of fats has become a potentially more important burgeoning sub-field, and one that can shed additional light on the specific breakdown of types of fats necessary in the diet.

One major study analysing specific lipid profiles and their impact on testosterone in men (before, during, and after a resistance training protocol) found that the amount of MUFA intake and the PUFA:SFA ratio were reliable indicators of resting T concentration, along with overall dietary fat intake levels. Several other studies have reinforced their findings.

Researchers found a significant *negative* correlation between the PUFA:SFA and T levels, meaning higher amounts of polyunsaturated fats in the diet relative to saturated fats had a negative impact on testosterone levels.

PUFAs include sources from both omega-3 and omega-6s (it's favorable to have

a higher ratio of omega-3:6, but that topic is beyond the scope of this program), including processed oils like soybean, corn, and safflower oil, walnuts, canola oil, flaxseeds, and fish.

The best sources of saturated fats are fresh animal products, such as meats, butters, and cheeses, which also happen to be rich in dietary cholesterol as well as monounsaturated fats, both favorable for testosterone production.

Researchers found that MUFA intake was positively correlated with testosterone levels as well. Most nuts and even fruits such as avocados and olives are outstanding sources of monounsaturated fats that will support testosterone production.

We can see from the research on fats, carbohydrates, and protein that the macronutrient profile of your diet plays an incredibly important role in mediating your testosterone production. Aside from training, diet manipulation is one of the simplest, and fast-acting manipulations you can take to increase your testosterone levels naturally.

Most people, seeing that the overall trend of the research places a heavy emphasis on consuming more fats and carbohydrates, and putting less focus on protein consumption in order to support an optimal endocrine balance may be somewhat dismayed or confused.

According the popular paradigm, fat + carbohydrate intake together = body fat accumulation.

However, this is simply not true, and also depends highly on the type of fats consumed and the type of carbohydrates consumed.

PUFAs + processed sugar, for example in a donut or piece of birthday cake, will obviously encourage fat gain if consumed regularly and in hypercaloric quantities. But that's because it is shitty food, devoid of nutrients and high in calories. These types of foods, when consumed over time, encourage appetitive behaviours and have even been shown to have addictive qualities, similar to illicit drug-taking.

Carbohydrates and saturated and monounsaturated fats consumed via real, whole food sources, rich in micronutrients and vitamins and minerals, will

nourish the endocrine system, especially when consumed together (ie. not neglecting one macronutrient group in pursuit of another).

On the surface, however, this type of diet may appear as though it does not necessarily encourage "getting ripped" - a state that most men would like to achieve. This assumption is partly correct, especially considering the fact that reaching abnormally low body fat levels typically requires considerable caloric restriction which decreases testosterone levels, and testosterone levels are also known to drop off in men below a certain level of body fat (see the chapter on body fat).

However, originally inspired by the work of Martin Berkhan of Leangains.com and his caloric and macronutrient cycling regimen for reaching low levels of body fat while maintaing or increasing strength, I naturally gravitated toward a weekly dieting paradigm that cycled macronutrients and would allow me to eat enough to support my training, keep myself satisfied, stay in a small weekly caloric deficit to continually drop body fat, and still eat sufficient levels of fats and carbohydrates.

The first thing you must understand is that when proposing an ideal macronutrient breakdown for a testosterone-supporting diet, such as 30% protein, 35% carbohydrate, 35% fat, or 20% protein, 40% carbohydrate, 40% fat, that this does not necessarily have to be consumed daily.

You can spread this intake out over an entire week, and cycle the intake of certain macronutrients to better support training and rest cycles.

For example, I specifically began consuming high proportions of carbohydrate and moderate protein on my training days, with fat coming in small, trace amounts, which fully supported my training and endocrine balance, from both the carbohydrate and protein standpoints.

Then, on my rest days, I would consume very low amounts of carbohydrates (under 50g) and get my nutrition from mostly high quality fats and proteins from animal meats and products.

Over the course of the week the entire macronutrient breakdown still averaged out to moderate levels of fat and carbohydrate intake and enough protein to

support my muscles in training. Intermittent fasting on this protocol enhances the experience (see chapter on intermittent fasting).

Simple.

Plus, this type of macronutrient cycling protocol encourages fat loss, in some cases drastic (if calories and food source quality are controlled), and supported much of my own fat loss back into the single digit range after reaching healthy male body fat levels of 12-14% mostly just through keeping a moderate amount of fats and carbohydrates in the diet and training correctly multiple times per week.

soy

Soy.

For past decade all we've heard trumpeted through the fitness industry when it comes to male nutrition is to stop eating soy. It's true: soy is composed of two potent isoflavone phytoestrogens, diadzen and genistein.

But has soy consumption been shown to actually decrease testosterone levels in the research?

No. Well... not really.

You see, in the limited body of research specifically focused on testosterone and soy consumption, no statistically significant correlation between the two has been found.

And in the handful of studies that do demonstrate a decrease in testosterone over the trial period, other researchers are quick to point out major flaws in the methods, rendering the findings useless.

So should you go back to chomping down edamame and soy burgers?

Hell no.

Here's why.

First, an estimated 25-35% of Westerners do not have the intestinal bacteria required to properly metabolize the phytoestrogen diadzen. In a 10-week study on diadzen metabolism, metabolic measurements varied 1000-fold between test subjects. And this was 38 people.

In a handful of people, variation was 1000-fold. Just imagine the metabolic

variation in a population of individuals the size of the United States.

Secondly, soy protein is an inferior protein when compared to animal-derived proteins. Soy proteins have been shown to metabolize quickly in the gut before reaching muscle tissue, with a significant proportion of amino acid oxidation occurring in the liver.

Animal proteins have been shown to be superior for encouraging testosterone synthesis when compared to plant-based proteins.

Third, soy interferes with proper thyroid functioning. Genistein antagonizes thyroid peroxidase, the enzyme responsible for thyroid hormone production. Soy contains goitrogens, which interfere with iodine metabolism as well. Your thyroid cannot function properly without sufficient iodine.

And oh yeah, it's also one of the most heavily genetically modified foods on the planet.

Soy is not worth your time or money

And it's definitely not worth your health.

The risks that come with consuming unfermented soy products far outweigh any potential benefits.

Note: there is a fundamental difference between fermented and unfermented soy products. Asian populations have been consuming fermented soy products for centuries, and these foods (such as natto, miso, and tempeh) are apparently benign at the very least. The fermentation process, coupled with healthier growing practices in Asian countries, mitigate much of the risk associated with the otherwise deleterious compounds in soy itself.

A massive campaign has been raging across the Western world over the last few decades, pushing GMO unfermented soy products on the general population under the guise of 'health.'

The cold truth that this is a money-making machine, and not a health movement,

shouldn't surprise anybody reading this program.

95% of the soy produced in the United States is genetically modified, with production owned and regulated by Monsanto, the creators of the insecticide RoundUp and the genetically-modified soy plant with the RoundUp-resistant gene.

The massive body of independent research on GMO soy implicates it in brain damage, breast cancer, thyroid disorders, infant abnormalities, infertility, kidney stones, immune dysfunction, and food allergies.

Unfortunately, due to the multi-billion dollar advertising push in the last decade, most Americans still believe it to be a 'health food.'

While many men purposefully avoid it because of the aforementioned buzz about its estrogenic qualities, its effects are especially deleterious on women, with soy milk consumption accounting for a potent effect on thyroid dysfunction and hypothyroidism.

In rat populations, GMO soy has been linked to infertility in future generations (third generation), demonstrating that the epigenetic effects of soy on the animal's body can be passed down through the bloodline.

Many informed health professionals have been calling for complete ban on GMO soy in the Western world, however they're fighting an iron giant with deep pockets.

I recommend just avoiding soy, period.

Read labels of packaged products and if it contains soy, don't eat it. You'll probably save a ton of money in the process.

You'll also end up eating more of the right foods, like good beef and poultry, eggs, cheeses, fruits, and vegetables, all of which will nourish your endocrine system and not destroy it like soy will.

supplements

- Testosterone boosters are not good at boosting testosterone, but many of them happen to be great supplements in their own right
- Supplementation with vitamin D and zinc will only help you to increase your testosterone back to a normal baseline range, beyond that use them for general well-being and health support
- Current research on testosterone boosting herbs is quite limited because as long as pharmaceuticals like Androgel continues to outperform herbs, the pharmaceutical industry has no reason to fund further research on herbal replacements
- DHEA is an effective male vitality supplement for middle-aged men
- Any potent antioxidant can increase testosterone in infertile men

In preparation for this section of the program, I wanted to talk to an expert on the subject, especially since I did not personally use any supplements to boost my testosterone and I was naturally curious about whether any of the claims made by supplement companies are true.

I reached out to the guys at the outstanding fitness supplement information site Examine.com and Kurtis Frank was kind enough to take some time out of his day to talk with me on the topic of testosterone supplements.

I've transcribed the discussion for you below. If you're interested in this area of health, I highly recommend you read this over a couple times. There are nuggets of golden information buried everywhere.

Transcription of the interview:

C: Hey, everybody. Christopher Walker here with Testosterone I/O, and I'm here with a very special guest Kurtis Frank from Examine.com, the internet's leading information source on unbiased supplement information.

So Kurtis, you've done a boatload of research, and written much of the research analysis on the site, and I just wanted to pick your brain a little bit in terms of supplements for testosterone boosting. There is a lot of information out there that says people need supplements to increase their testosterone, or they will need pharmaceuticals, and I don't want to lead any questions or anything, but what is your take on the current landscape in terms of the herbal options and pharmaceutical options in terms of what people might see?

K: In regards to the entire supplement industry in that particular genre of supplements, I have a really fatalistic approach on the efficacy of increasing testosterone, but liking the concept of testosterone boosters for what they currently are.

It doesn't make much sense until I explain further.

Basically, even if we assume that half of the supplements on the market right now do increase testosterone, and that's a very optimistic view, then the ones that do are in the range of 20-50% for any single ingredient at best.

And maybe if we are incredibly optimistic we'll see 100%.

Now the thing is with percentages, they're inherently misleading on the topic of testosterone. I don't know the exact normal range, but I believe it is 200-1000 ng/dL, so you can literally have a 200% increase and still stay within the normal range.

C: Well, with respect to those percentages, when people make a claim on a booster that it will increase T by 100%, how transient is that? Is it just 100% for 24 hours, or 20 minutes?

You see that a lot even in just physical manipulations, where testosterone levels will go up transiently for a couple hours before falling back to homeostatic levels.

K: It's really hard to guess, because usually the studies conducted with rats or mice, they usually just put it in the food supply and measure levels once daily.

So it's sort of a one time measurement then they work out the numbers out from there. There isn't really a day-long study that measures over an entire day. So it's totally possible that these are merely causing a spike.

C: Okay yeah that's actually something that I've seen in all of the studies I've been reading. They don't look at a prolonged period over time which makes the information more difficult to extrapolate on.

K: Yes, the first studies are always like that, but we should get more detailed as the science progresses. It's just that, with testosterone supplementation, there is no incentive for them to continue research.

Unless an herb can consistently outperform pharmaceuticals like Androgel, the pharmaceutical industry is not going to continue research on it. And no herb is coming anywhere near outperforming that stuff.

C: Yep, well, can we talk about what you guys have on testosterone on Examine.com right now?

A couple of the big things that you hear thrown around a lot right now in terms of micronutrients, vitamin D, zinc. How effective would you say adding these things

to your overall program or lifestyle that in general is not supporting testosterone? Say you're barely lifting and you have a bad diet, Is it going to have any blip on the radar?

Second, is this kind of supplementation protocol going to help in an overall scheme if you're doing everything else right in your lifestyle? Is it worth the money?

K: Well, if the question is "is it worth the money" then vitamin D is almost always a yes.

3-5 cents a day is such a small amount per day. You'll see it improve your general outlook on life and well-being, which is generally the first thing you'll notice when you drop below your normal testosterone range.

So if you're going about your day with normal testosterone, but you're not getting any vitamin D or zinc in your diet, then your well-being is going to suck in general. Your mood state is going to completely deteriorate, and that's usually just because of general deficiency. In that state, replenishing the zinc will normalize testosterone.

But if you just take more zinc and vitamin D it won't do anything special beyond that. It's just to get rid of the deficiency, and no more.

C: Okay, so basically you can reach a baseline level to where you're not deficient?

K: Exactly.

C: And you can find out whether you have deficiencies by going to get tested by a physician or self-testing services like WellnessFX or Talking20.

K: Yes, you can either get a blood test to confirm, or you can just record your diet for a week and then if you are consistently below 75-80% of the recommended daily intake, then you'll be able to just temporarily assume that you're deficient so low dosing will have a good effect.

It's a lot cheaper.

C: Examine.com has quite a bit of information in terms of the supplement claims on testosterone boosters and then what the research actually shows in terms of whether this is actually worth your time or not.

There is this huge laundry list of supplements that make claims, but you have this stack here, 'The increasing testosterone stack.' Are all of these supplements alone not going to make much of a difference? Or is it the combination of these that makes it effective?

K: Well, no we just named it a stack page because that is a common term in the supplement industry. If you see a stack page, you know what's going on.

We don't recommend you take all of them, we just recommend you go down the list and see if that supplement will work for you or not. Each one will have a little caveat. Like for vitamin D: increases testosterone if deficient, and has been confirmed to not increase testosterone further. Same for zinc.

DHEA says that it may increase it, although the evidence has been unreliable. So it could work, but at the same time don't get your hopes up.

D-aspartic acid is on the list as well, though some recent evidence suggests that it may be only a transient effect. Everyone was wondering why the first study stopped at 12 days, and I was talking to some people who were doing in-house testing on it, and there was a new study that lasted 30 days, and it apparently spikes between 5-12 days, then it starts get attenuated back to normal at around a month where it might actually dip below baseline.

So technically it increases testosterone, but practically, might not be a great option.

C: And so for DHEA, it appears to be more effective for guys over 40 years old.

K: Yes, it's a good anti-aging supplement. There's the old saying "you can add life to years, or years to life" and the word anti-aging applies to both, so you can either try and increase lifespan, or just have a 70-year old feel younger yet die at the same time. Those are both considered anti-aging.

DHEA is one of those that adds more vitality to your later years, but you'll probably still die at the same time. Still quite beneficial.

C: So anyone [reading] this that's over 40 years old, DHEA might be a good option for increased vitality.

Okay, so now I am interested in your opinion on two things that get a lot of play in the media, and those are: maca and tribulus.

K: This is going to be interesting! I love talking about both of those products.

To start with tribulus... three studies in otherwise healthy people - actually one of them was just two case studies - they all showed no effect on testosterone, no effect on lean body mass, fat mass, or even sports performance.

In the last study, a 14% boost in testosterone in infertile men.

Now for [readers], this is a really important thing: for studies that claim to boost testosterone, always look for the fertility status of the subjects. In men who are infertile, there is usually a high amount of oxidation going on in the testicles, making the sperm have low motility, low count, etc.

Any potent antioxidant can increase testosterone in infertile men.

Vitamin E does this, CoQ10 does this, and tribulus is a very potent antioxidant, actually more potent than vitamin E, which is really weird.

So in tests like that, usually they use percents because there is such a low baseline testosterone level in infertile men that the numbers are inflated.

So you can say technically that tribulus increases testosterone, but for all intents and purposes it doesn't.

But it's still an interesting herb and a potent antioxidant. It's good for urogenital health and male vitality. We just assume that means testosterone, because well... testosterone sounds manly. It's also a diuretic and may dissolve kidney stones as well, so it might help you for that area of the body. Beyond that it does have libido enhancing properties that some people falsely attribute to testosterone. And even though the findings are preliminary, it could actually be cardioprotective, helping to protect heart tissue.

It's a very healthy herb, and if you want to take it for the libido or confidence, feel free to take it, just don't claim that it boosts testosterone.

And for macca, that's the one that doesn't do anything in terms of steroid hormones. Doesn't do anything for estrogen, doesn't do anything for testosterone, but it's still a really reliable libido enhancer in both genders. And is minimally healthy I guess. Nothing amazing from that point of view, but it is a vegetable.

C: So it would seem that the trend with a lot of these boosters and herbs is that they're more effective for short term libido enhancement. What are they acting on because libido is moderated by the dopaminergic system. Is that what they're acting on?

K: It depends. It varies. In terms of maca, it has a class of structures in there that are really weird. We don't know how they work, they just do.

And you mentioned short-term libido, but for both of these herbs they've actually been shown to last over longer term. Something like yohimbine though is like bam, 30 minutes then it's done.

For tribulus, I do know one study that measured the hypothalamus and it increased androgen receptor density. So the testosterone that is in your body could act more in the hypothalamus, and testosterone does mediate libido.

If I recall correctly, ginkgo biloba does interact with dopamine.

But for a lot of them, we don't really know how they work, they just kind of do.

C: And in terms of yohimbine, that was the last thing I wanted to check on, because it is actually effective and works for what it's good at, and it helps mobilize stubborn body fat. What is your take on this in the context of libido enhancement and testosterone? What would a guy want to use it for?

K: For short term erections. Libido enhancement as well, but it's mostly pro-erectile. Any short-term usage or fat loss.

But people need to be aware that it is one of those supplements that could be

bad if used wrong. It's one of those cases where it doesn't have a built in deterrant, like some supplements are just too expensive to overdose on, or in some cases like creatine it's literally impossible to eat too much.

But yohimbine is one that, if you have a great workout one day, then decide to take double the dosage the next day with caffeine you could hurt yourself. Something could go wrong.

C: What would going wrong look like?

K: Well, yohimbine is a stimulant that augments other stimulants in the body, and in the case where it doesn't, it'll just augment your natural endogenous stimulants. So an overdose would most likely be cold sweats, blurred vision, cardiac arrhythmia - the whole "I overdosed on amphetamines" look. And you'd probably have a raging boner at the same time.

C: Haha, well Kurtis, I really appreciate your time today. One last question, is there anything for middle aged men that may help with general vitality and well-being?

K: Two in particular. One is called pycnogenol, it enhances blood flow. When I was working the Examine.com human effects matrix, pycnogenol got a lot of notable results in the research, which is weird becuase when you look at the science of how it works, you wouldn't think it would.

Blood flow, well-being, osteoarthritis and joint pain symptoms go down as well.

And the other thing, it goes by the name of nigella sativa. Black cumin seeds. It's an indian spice.

When I'm researching it I'm getting a lot curcumin vibes from this. The best thing about it is that you don't even need a supplement. The active dose is 3g of the seed. The active usage is to put it on food and eat it.

Just eat the seeds.

It tastes like black pepper.

It's not related to pepper, or cumin. It's a completely independent thing.

Check into an indian grocer in your area and you could get it for really cheap. If you can't find it then just go on Amazon. You can grind them up and put them in a shake as well and it would probably taste pretty good. The seeds are pretty balanced in fatty acids, proteins, and carbs, so some companies extract the oils as well. Same benefit.

C: Thanks Kurtis! I learned quite a bit today. I really appreciate all of your time.

Be sure and check out Kurtis' outstanding work over at Examine.com if you ever have any questions about supplements and want unbiased and well-researched information.

training

neuromuscular training

The purpose of this section is to answer the question: *how should I train to optimize natural testosterone production?*

To answer this question properly, we first need to examine the biological relationship between muscle stimulus and the endocrine system. This examination will lead us to further explore the neuromuscular system.

Interestingly enough, testosterone stimulation via training and testosterone stimulation via nutrition are two totally independent paradigms.

This is great because it allows us to delve into them separately. When the optimal way to live, eat, and train are combined in an individual's lifestyle, they will compound on one another, yet remain separate systems so they can more easily be manipulated.

In this training-focused section, I want to break the analysis and prescriptions down into two main areas: how to train if you are an endurance athlete (and want to remain an endurance athlete) & how to train if you are anybody else.

The latter group will be far more successful in naturally increasing their testosterone quickly. So I recommend being, or becoming, a member of that latter group of men.

However, if you are an endurance athlete and have much of your ego and life's worth (hey, maybe it's your job to win races) tied up in your sport and you aren't ready to let it go just yet, I feel for you.

I was in your shoes once. Training 4-6 hours a day so I could race in the Pro/Open category at races. So I could run just a tad faster than last race, or drown just a little bit less during the swim as a triathlete.

Hours and hours in the pool and on the road will condition you to become a bit addicted to the lifestyle, addicted to the endorphin high. So I understand.

I also understand that you have probably got insanely low testosterone, probably partly due to poor nutrition strategies and partly due to chronically elevated cortisol.

Despite being able to run/swim/bike/row super fast over long distances, you probably still have stubborn body fat hanging around. Heck, even many pro triathletes are skinny fat.

So a part of this section will be dedicated to the road warriors.

You will not see as impressive results as men who train 3-5 hours per week, but if you implement my suggestions, you will see some results, an overall improvement from where you are right now. And that's worth the price of admission alone.

Here's how this section is going to work, so you can navigate it however you please:

- Introduction to the neuromuscular system & why it is so vital to have a basic grasp on this information
- What is currently considered the best way to train for T & GH production, and why I think this is incorrect
- The solution I propose - the exercise and style of training I think is superior to how we're currently told to train… and why
- How to train if you are a normal Joe, weightlifter, sprinter, Crossfitter, or basically any guy who isn't an endurance athlete
- How to train if you are an endurance athlete

Exactly How To Train For Optimal Hormonal Response (Short and Long-term)

Very recent study into the dual steroid (T and Cortisol) effects on training in *elite* athletes (as late as 2011), as opposed to older studies that often focused on untrained or moderately trained (with loose definitions of the word 'trained', varying from study to study) has, interestingly enough, opened up a ton of insight into this new paradigm for optimal endocrine response training.

In short, studying elite athletes gave us new insight into how average (untrained & moderately trained) individuals should train to optimize testosterone up-regulation.

The idea is to use certain factors (workout design, nutrition, genetics, training status and type) to modify T and C concentrations and therefore influence resistance training performance and adaptive outcomes.

Changes in the concentrations of T and C can moderate or support neuromuscular (NM) performance through various short-term mechanisms such as 2nd messenger signaling, lipid/protein pathways, neuronal activity, behavior, cognition, motor system functioning, muscle properties, and energy metabolism.

A greater understanding over the recent years of T and C has led to suggestions that, beyond the more popular applications in morphological (ie. muscle size) and functional (ie. power and strength) enhancement, these hormones also exert heavy influence over NM functioning (ie. neuronal activity, intracellular signaling, and muscle force production), which means they contribute to the

adaptive responses to training by regulating long term muscle performance via short term regulation of NM performance.

In short, we need to use NM training to influence long term muscle performance and optimize hormonal response to training.

It all comes back to my original philosophy of always addressing the roots of an issue as opposed to a symptomatic approach (and in life, operating on principles as opposed to stressing over details).

What is the neuromuscular system?

When I say NM system, I am referring to the peripheral nervous system (PNS in short). This consists of motor neuron units and innervated (stimulated to action) muscle fibers.

When looking to design a training program, we want to operate on the premise that acute elevations in endogenous hormones will increase the likelihood of receptor interactions, which will mediate long term adaptive responses.

Researchers are now shifting a lot of focus onto NM research in athletes because they're recognizing that neural factors may play a role beyond that of hormones, especially in early phase adaptations (which I'll discuss momentarily). However, the specific mechanisms for action still need to be examined as this is a relatively young (and ridiculously complex) field of study.

One thing that studying elite athletes made very clear to us is this: beginners may have a distinct advantage over highly trained individuals in terms of ability to elicit a workout-dependent testosterone and growth hormone response.

While elite athletes can generally elicit higher magnitude responses to their training, the stimulus needs to be far more specific.

For untrained or average individuals, the stimuli can be far reaching in variety and still elicit a high response, but they must operate on a set of known principles for the optimal response.

This initial testosterone response in untrained individuals is thought to occur mainly as an adaptive response of the NM system to support continual training under the new stimulus, which makes a lot of sense. Your muscles need to rapidly change to support your training, and the main way for them to do so (if you do the correct type of training) is to up-regulate androgen receptors with increased content and sensitivity.

So for the majority of guys reading this program right now, even those who believe themselves to be highly trained (even if you are, it is probably in a very specific sport-related style) you will experience rapidly elevated workout-dependent testosterone levels with the correct training to assist muscular adaptation.

For example, I was considered an elite triathlete for the period of time before embarking on this multi-year self-experiment. My testosterone levels were very low, but my level of muscular and cardiovascular training relative to my

sport-specific functions was very high.

I could run and cycle very fast over long distances.

However, when I stopped training that way, and shifted slowly into my current style of training, I quickly realized how untrained my muscles were to support this NM style for hormonal optimization.

In short, I was weak as f***.

I will extrapolate this notion and speculate that even common weightlifters, crossfitters, and gym rats (ie. people with several years experience in resistance training) will find themselves noticeably untrained in this specific capacity when first embarking on this NM-style training according the algorithm I am going to propose.

Gymnasts and street workout guys will probably not have such a difficult time.

Endurance athletes, yes… it's going to be a big change.

(For example, several of my clients find they need at least one short nap per day along with a good nights' sleep to recover initially from the shift in training style during the first few weeks of the program, even though training sessions only run around 60 minutes in length – they adapt shortly thereafter).

To illustrate the advantage (I'm framing it as an advantage, but of course, it's all relative) that untrained individuals have over elite athletes when it comes to general T response to workouts (again, not magnitude, but reach and lack of specificity) I'll use an example that researchers found in elite 400m sprinters vs average individuals sprinting 400m.

In the elite 400m runners, every repetition decreased T levels post-sprint and increased LH levels. What this says is that they may have a decreased androgen receptor (AR) response to the training stimuli due to extensive training. Either that or an increase in glucocorticoid receptor (GR) sensitivity which would naturally suppress the T. I'd put money on the notion that it's a mix of both.

By comparison, the untrained sprinters saw a significant increase in T concentrations post-sprint with unchanged LH levels, indicating an increased AR sensitivity due to the new stimulus.

This indicates that it may be better for untrained individuals to hit harder fatigueable bouts, but in low enough quantity to not elevate cortisol significantly, which introduces the idea of a **training stimulus threshold**.

A Formula For Optimal Testosterone Production via Training

Take what you just learned, and remember it. We're going to introduce a couple more concepts now, then mash them all together to formulate the perfect algorithm for training-induced T production.

Researchers have found that explosivity encourages NM adaptations necessary to support the training demands (ie. indicating a long term adaptation), and that a training threshold very likely exists.

We want to up-regulate AR content in fast glycolytic muscle tissue (as opposed to slow oxidative tissue).

Resistance training is unanimously agreed upon as a potent stimulus for testosterone production and muscle growth, but the specific type is either not

discussed or not agreed upon. What we do know is that resistance training promotes an increase in both AR mRNA (ie. gene transcription) and protein content and T concentrations.

So combining both of these ideas, we can come to the conclusion that explosive resistance training is the optimal form of stimulus – as long as it is performed under the performance threshold (so as to continually promote AR upregulation without compromising due to cortisol/stress-related suppression).

But that's not the entire picture. It's also not entirely different from what the pop-fitness media promotes.

One more key element to the equation is often overlooked.

And that's the idea of workload and its relationship to muscle volume activation (MVA) relative to intensity.

It has been demonstrated that the magnitude of the hormonal response to training is proportional to the size of the muscle volume activated. This is why we hear the old paradigm of "squat, squat, squat" to increase testosterone. Big leg muscles = more muscle tissue activated.

However, this MVA-dependent hormonal response is **relative to the intensity of the movement performed**.

Squatting high reps for hypertrophy training may stimulate GH and T production, but I'd argue that it won't be optimal because the intensity is not high enough, it is just drawn out over more reps. On the flip side, low rep squatting implies higher intensity, but allows for less total work done on the muscle.

Work, as a mechanical construct in physics, was originally defined by French mathematician Gaspard-Gustave Coriolis as "weight lifted through a height." The main equation you see everywhere is:

$$W = Fd$$

Where W is work, F is the magnitude of the force and d is displacement.

Researchers have found that, in terms of GH response, high amounts of work done – that is, high amounts of force related to the weight displaced – generated a significantly higher hormonal response to training than low work done.

So let's recap, and combine all of the knowledge up to this point in the article in order to formulate the idea of an optimal T-response-oriented training paradigm.

High workload, with a high proportion of muscle volume activated relative to intensity of the stimulus on said muscle volume, which should be performed via explosive resistance training done under a performance threshold (ie. self-limiting) = optimal.

Expressed algorithmically, it would look something like this in its simplest form…

$$W\ (MVA * i) < \text{Stress Threshold}$$

Where W is work (Fd), MVA is muscle volume activation, and i is intensity.

The stress threshold is defined as the point after which negative adaptations occur in terms of GR upregulation and the subsequent increased sensitivity to stress-hormones, which are known to suppress androgen production.

So in short, we need to use this style of training, and walk the line under the stress threshold.

This is achieved best through explosive resistance and optimized by activating the most muscle possible over maximal displacement (at explosive intensity) while remaining just beneath the threshold.

I believe that in order to keep our training beneath the threshold, calisthenics becomes an increasingly attractive form of training due to its self-limiting nature and relationship with gravity (ie. if you can't do another muscle-up, you can't just subtract weight from your body as you could with a barbell in order to get additional reps or sets into the workout session).

This hypothesis, based on the literature to date, is also supported anecdotally by my own training style and the subsequent response that it had on my total testosterone levels.

In terms of rep ranges, I believe that, with challenging calisthenics and weighted calisthenics movements, staying the in the 5-rep range and focusing on explosiveness is optimal (with slight variation up to maybe 7-8 reps and as low as 3 reps due to fatigue later in the session).

This is based on the idea that in the 5 rep range you are able to perform an explosive set with high force and displace enough weight to keep total work high, but relative stress low. Much higher than 8 reps at the correct intensity will, I think, negatively affect your performance threshold, and any lower than 3 reps

will compromise the intensity of the movement.

This is also why I advocate "enough rest between sets to recover just enough to perform another intense, slightly sub-maximal set" – no more, and no less. This will vary based on the individual but will probably fall in the 1-3 minute range based on the movement and the training level of the individual.

And this brings me to my main training assertion: **the muscle-up is the king of testosterone-inducing training movements.**

1. The muscle-up is inherently explosive. There are only two ways to make it any more explosive than it already is… either add weight to your body weight, or do a plyometric muscle-up (yes, people actually do these). The latter involves quite a bit more momentum though, so the additional explosiveness may be slightly compromised.

2. The muscle-up, especially the weighted muscle-up, activates a HUGE percentage of muscle volume, from the feet (if weighted on the feet) to the fingertips. Abs, quads, back, shoulders, chest, calves, facial, etc etc etc are all activated with a weighted muscle-up. The entire upper body & core is activated in bodyweight muscle ups, with slight activation of the quads and large leg muscles due to isolated contractions.

So I'd argue that the muscle-up (especially the weighted muscle-up) is either comparable or superior to squatting and deadlifting in terms of muscle volume activation.

The benefits that it has over those other movements that makes it superior all around for testosterone and GH production are the facts that it is inherently explosive, which will lead to a much higher fast glycolytic action in muscle

tissue than the inherently slower, less explosive barbell movements (also necessary in terms of safety), and that it allows you to displace a large amount of weight with that explosive force and high intensity, which amounts to a high workload.

For example, a 6 foot tall 200 lb man may do a workout of 5 x 5 muscle-ups (bodyweight), displacing 5000 lbs total over the session, with the magnitude of the Force being exerted over a distance of 3.5m (rough calculations based on the common 7-8 foot high pull-up bar). That's a lot. 81,000 Joules of work, *roughly**.

Conversely, let's say that same man squatted 300 lbs for 5 x 5 (we do not count any bodyweight since the weight he's displacing is in fact the barbell and not his body weight), displacing 7500 lbs total over the session, with the magnitude of the Force being exerted over a distance of roughly 2m (since he's 6 feet tall – he's also not doing ass-to-ground squats but we'll leave it at 2m). That amounts to 61,000 Joules of work. Significantly less than the muscle-up work.

Now add to that the (very difficult to measure) physiological differences between the two movements in terms of muscle volume activation and overall explosivity and glycolytic action in the muscle tissues.

Based on my estimates the muscle-up wins.

Add weight to the muscle-up and it sh**s on squats.

endurance athletes

Clearly I have strong feelings about the damaging effects endurance sports have on the human body. And if that wasn't clear - I do.

But to each his own, I completely understand the allure to those sports, having been an obsessed triathlete in my own past. And with that empathy in mind I would like to offer some helpful suggestions for my triathlete/swimmer/runner/cycling/crew/etc brethren who think they may be experiencing hormonal balance issues.

There are some general principles upon which you should structure your training, and they're backed by healthy research findings.

To begin, if you'd like an additional resource, I did a podcast with Ben Greenfield from Ben Greenfield Fitness (if you're into endurance sports you likely listen to his show already) and his site is where I initially proposed what I'm going to suggest below.

You can listen to the interview here.

Always remember that no matter how much stress-induced damage you may have done on your body to this point, your body is inherently intelligent, and when given the opportunity to facilitate its own healing, will undergo some

absolutely unreal improvements in a very short amount of time. It just needs the go ahead, the green light so to speak.

So give your body the green light.

As a former serious triathlete & duathlete, I know exactly what most multisport athletes deal with every day. From the chronic fatigue, muscle soreness, low libido, low muscle mass, and bone density issues, to adrenal fatigue, overtraining, blood sugar swings, sleep issues, and ravenous hunger, the everyday life of a devoted endurance athlete can be quite the grind.

The reality is this: those problems are all either caused or influenced, in some way, shape, or form, by your endocrine system. Several key hormones play roles in these processes but the biggest culprit, in terms of endurance training, is cortisol.

Training is a stressor to your body.

The nature of multisport training has athletes out on the road or in the pool between 1-6 hours a day. Now, don't be mistaken, cortisol is not an inherently "bad" hormone; balanced levels are responsible for baseline vital functions in the body.

However, an excess or dearth of cortisol both indicate an unbalanced system: too high or too low. They are both bad in their own ways. As an athlete, you must take care to mitigate prolonged, or chronic, exposure to stressors, lest your endocrine system, particularly your adrenal glands, become overworked.

*The following are my recommendations for **10 steps you can take in your training, right now** – and they are simple to implement – that will, over time, lead a more balanced endocrine system: which will keep you strong, lean, and happy.*

1. TRAIN YOUR MIND:

Before we get into the physical steps, let's talk about thought processes. This is where it all begins. If you approach your training with patience and your nutrition with balance you will:

a. Be able to sustain the positive improvements easily.
b. Drastically lower your mental stress levels, which can have a significant effect on your cortisol levels & wellbeing in general.

2. CREATE A MARKED DICHOTOMY BETWEEN GOING HARD AND RECOVERING

In your training you will want to really focus on recovery when you are recovering and on going hard when you do your interval work. People say it all the time but it's still very common to overlook and most of us tend to continue slogging away as a one-speed athlete somewhere in the middle.
There is no shame in going easy on your rest days. Race during the race. Train intelligently so you will have a good race.

3. TRAIN EXPLOSIVENESS

My 17 year old brother, a high school runner, is looking to get his times into the mid-15's for 5km and 4:12-18 for the mile this year. He has great inherent talent and speed, however, as he looks toward bringing himself to the next level (i.e. sub-15 and low-4 min), he should be placing a large emphasis on training his explosive power in his entire body (including upper body).
Beyond the fact that the training is undertaking should focus deliberately on increasing both his stride rate and length (which equals increased speed), and

deeply strengthening the muscles in his core (back & front) and quads, he should also be looking to create a noticeable increase in circulating testosterone & growth hormone release over the coming months, while simultaneously decreasing cortisol levels via whole body resistance training.

Training fast-twitch muscle fibers has long been scientifically-correlated with increased levels of testosterone and growth hormone, both of which have been found to have antagonistic effects on excess cortisol – especially with regards to breakdown of adipose/fat tissue.

4. TRAIN IN THE AFTERNOON/EVENING

This may be a big change, but I recommend sleeping in (#8) and undertaking your training in the afternoon or evening. Research has shown that, because some hormonal secretions tend to be influenced by circadian cycles, subjecting your body to training stress in the morning, a time when your circulating cortisol levels are naturally high, may be counterproductive for those trying to reach a balance.

5. MITIGATE FREE-RADICAL EXPOSURE

Large amounts of exercise are known to create an imbalance between levels of antioxidants and free radicals, a process known as oxidative stress. If you are training heavily, you'll want to supplement your diet with some common antioxidants: vitamins A, C, E, glutathione, and flavonoids being the easiest to get your hands on.

6. TRAIN USING VOLUME…AND QUALITY

Loads of people – coaches, gurus, & weekend warriors alike – love to draw lines in the sand. We all love to think that our way is the best way. Multisport culture

has been fixated on this forever-old training debate regarding quality versus quantity.
I'm here to tell you that you should do both. In the effort of balancing your endocrine system, you must take a balanced approach to many other things, including training.

Repping out hard interval workouts 4 or 5 times a week is just as unhealthy as slogging 110 mile weeks at 160bpm. Refer back to #2 and take that idea and apply it to your training. When you go out for a recovery run, makes sure it's rejuvenating. Shoot for a constant low heart rate, even if it means walking up hills. Walking is so underrated. Recover.

And when you do hit the track or the hills, really punch the gas. It's good for you. And do it in shorter, harder intervals.

7. BECOME FAT-ADAPTED

Increased HPA activation, cortisol secretion in particular, has been implicated in visceral obesity and the accumulation of stomach fat. Becoming fat-adapted as an athlete – teaching your body to call upon its fat stores for energy, as opposed to its glycogen and sugar sources – will allow you to not only decrease your levels of circulating cortisol over time, but also limit hunger, decrease body fat levels, increase insulin sensitivity, and maintain lean muscle mass.
This can be done primarily through fasted training - very straightforward.

8. SLEEP AS MUCH AS POSSIBLE

Sleep is one of the body's finest homeostatic regulatory mechanisms: give it the opportunity to do its work. Make sure you give yourself plenty of time to catch some Z's if you're looking to reach a balance. Sleep is also wonderful for memory consolidation. Lack of sleep has been found to dramatically elevate

cortisol levels over the following day.

9. PRACTICE FASTING

Intermittent fasting is a wonderful thing. And nowadays there is a ton of good information on it all over the internet. For most sugar-burning endurance athletes it will be near impossible to make the switch to daily fasting while still maintaining your current training load. That is why it's so important to train your body to become fat-adapted.

I've found that personally I can now go well into the afternoon with a fast, then do an entire workout (even had a period where I would do a routine 8 mile run fasted), before eating my first meal (and it was a BIG one ;D). This is fat-adaptation. My workouts are great, and I have tons of energy all day, because my body burns a high percentage of fat for fuel, not sugars.
Intermittent fasting, even without a decrease in overall caloric intake, has been shown to significantly decrease cortisol concentrations.

10. BE INCREDIBLY PATIENT

You didn't get out of whack in day so don't expect to fix it in a week. **The process of balancing your endocrine system is long and slow,** requiring constant implementation of these simple changes. This is especially true for endurance athletes, due to the nature of constant exposure to negative stress. The best method to induce sustainable change is to integrate them into your lifestyle so they're second nature.

mini-cycles

One effective way to combat some of the negative impact that endurance training has on the human body - if you still insist on doing it, whether for triathlon, running, swimming, crew, cycling, etc - and that is to restructure your training in mini-cycles.

I'll use triathlon as an example since I used to race and I have a client we can model our training recommendations off of, because this is working very well for him.

The concept of a mini-cycle flies in the face of the common endurance training paradigm of training every single day, with either high volume or high intensity. Both high volume and high intensity training, when performed chronically, will have adverse effects on the body, though they may be potent stimuli for fast race times.

So is there a way to get the potent stimuli with less volume and less chronic intensity?

In my experience, yes.

The mini-cycle paradigm combines both a high volume, low intensity two day mini-cycle and a low volume, high intensity two day mini-cycle into one 6 day macro cycle, with two days of rest, each between mini-cycles.

So over the course of 6 days you get two full days of rest, and 4 days of potent stimuli training.

To make that easier to envision, it looks something like this for triathlon:

- Mini-cycle 1 (short, hard ride followed by short, hard run)
- Mini-cycle 1, day 2 (swim with focus on sprint intervals, weights with focus on compound movement explosive power generation)
- Rest day
- Mini-cycle 2 (Long, easy ride, followed by long, easy run)
- Mini-cycle 2, day 2 (swim with focus on long aerobic intervals of 800m-1000m, weights with focus on compound movement explosive power generation)
- Rest day
- Repeat back at mini-cycle 1, day 1

This way of training sticks to the basic principles of training for optimal hormonal health by using a marked dichotomy between training stimulus and rest.

Most endurance athletes rarely rest, even though rest and recovery are arguably the most crucial aspect to not only performing better, but also having a well-functioning endocrine system.

With mini-cycles, the rest is built in. And at least with my client on this protocol, after just a few cycles, he actually found himself looking forward to the rest days since he was putting in so much high quality training on the training days themselves.

And that is the other important aspect to this philosophy. The training stimulus must involve a considerable amount of effort to be most effective.

This is easily achieved psychologically, and then physically, because the athlete mentally knows that it will be another three days before they have to perform a similar training movement (cycling/running, for example) so they can focus all of the energy on giving their best effort in the current training session, without having to hold back anything for fear of not being able to recover in time for the next session or feeling too burned out.

Also, the weight training should be similar to what I recommend in terms of utilizing the full body explosive muscle activation in compound movements, focusing on activating a large amount of muscle volume in each movement. The combination of biking and running on the same day, then swimming and

lifting on the same day, also somewhat splits the body into halves (upper and lower) while still engaging the entire body (just in a skewed fashion), making it easier to focus on giving 100% effort in training for the day since you have a guaranteed 2 days to recover before doing it again.

When putting my triathlete client on this protocol, a very fast athlete in his own right, we saw a couple things within the first three weeks.

First, his training times and power output, measured by the power meter on his bike, improved immediately. He is able to push more power over longer distances on the mini-cycle protocol than he could on his more traditional style triathlon training plan before.

Second, he is steadily dropping body fat that just weeks earlier was very stubborn. This is combined with the fact that we reintroduced a substantial amount of carbohydrate into his diet to support the training intensity, and cycled with a lower carb, mostly fat and protein day on his rest days.

Even if his training times weren't to improve via the different training stimulus, his power-to-weight ratio is improving which means he'll be faster anyways. However, he is simultaneously improving with both his training and his body composition, so his times are noticeably improved and on a steady weekly progression into his big race for the year.

His sex drive also jumped back within days. Without divulging too much information, within the first week of switching things up, he shot me an email saying that he'd already noticed an improvement 'downstairs.'

This is really important, especially because nearly all serious endurance athletes have extreme libido and sex hormone issues due to the chronic stress of the sport itself.

special topics

sleep

Sleep quality and timing are of utmost importance when it comes to optimizing your natural testosterone production.

You may be thinking, “Obviously I just need to sleep more - everybody always says to sleep more, but I still have trouble finding the time, or I just cannot fall asleep in the first place anyways.”

Here’s the deal: most people miss the point with an overly simplistic view of sleep, and the role it plays in optimizing testosterone production.

It is true, however. You do need to sleep more.

A study conducted in young men found a significant drop in testosterone levels with even just the reduction from 8 hours of sleep per night to 5 hours.

In the Western world, a 5 hour night is commonplace.

Most people live like that for the majority of their lives. No wonder we’re all having issues with this.

Sleep is especially important for those of us who lead hectic, busy, hard-charging lifestyles. You might work a challenging job in a big city, study around the clock as a student, or sit on the highway for a 2 hour commute every day.

Most of us lead lives and have careers that are inherently stressful in the first place, so high levels of circulating cortisol put us at major risk for low testosterone… even if we're doing everything else right in terms of training and nutrition.

So adequate sleep should be a priority.

What exactly happens in the body when just a couple fewer hours of sleep causes such drastic drops in testosterone?

Quite simply, less sleeps means less activity in the pituitary-gonadal axis during the prime part of your body's natural circadian cycle.

This reduction in activity comes in the form of less LH secretion, with the limited LH leading to a reduction in testosterone production.

Studies have found this reduced activity to take effect with as little as 3 hours reduction in total sleep time and to become increasingly more pronounced up to 48 hours of sleep deprivation.

While the exact determinants have not been examined as to precisely how this happens, scientists do know that it has a lot to do with the body's circadian rhythms and the pulsatile manner in which pituitary hormones are secreted.

Because of this vitally important rhythmic cycle in the body, however, like I hinted at before, quantity of sleep is not the only important part of this equation, timing of wakefulness appears to be just as important.

In a 2012 study published in the Journal Of Clinical Endocrinology, researchers decided to look deeper into the matter of sleep timing and the role it plays on hormonal secretion. They split test subjects into two groups: one group had sleep restricted early in the night but awoke at normal times (ie. they basically just stayed up late and woke up at a normal time in the morning) and the other subjects were forced to wake up unnaturally early.

What did they find?

The group that stayed up late over two nights showed no significant change in LH, T, or PRL secretion following the trials.

The group that was forced to wake up early showed significantly reduced pituitary activity which resulted in markedly lower LH, testosterone, and PRL levels in the morning.

So if you ever needed a good excuse to hit the snooze button on the alarm clock - now you have it.

Waking up too early can have a notably adverse effect on your testosterone production.

And although this particular study did not examine the relationship between cortisol and these parameters as well, these findings make perfect sense in the context of natural cortisol secretion being higher in the early mornings.

So, long story short, if you intermittently need to sacrifice sleep in the name of getting extra work done, I advise you to stay up late and not to get up early in order to finish that project in time.

College students rejoice.

However, this study was only conducted over two days. Remember, other studies show a significant reduction in testosterone levels with just slightly limited sleep quantity over time. So you must take measures to aim for the recommended full 8 hours of sleep per night, and not take this as a free-pass to stay up late every night.

Use this knowledge to make better decisions when the time calls for it. Staying up later is better than getting up earlier.

Chronically staying up late, and sacrificing overall sleep in the process, will still lead to chronic reduction in pituitary-gonadal activity and a chronic increase in circulating cortisol - so don't do it often.

sexual function vs. desire

Sexual function and sexual desire are two different, independent things. However, they are both influenced by your testosterone levels.

Let's break them down.

It may seem like common sense as to why you, as a man, would want to maintain both healthy sexual function and healthy sexual desire far into your old age.

However, most men confuse one for the other, and oftentimes find themselves neglecting to take care of their health in these areas.

Sexual Function

Sexual function refers to your ability to execute the biological act of sexual intercourse.

Can you get and maintain an erection? Is it soft, or rock hard? Do you ejaculate optimally, as opposed to prematurely?

These are all important questions.

Sexual dysfunction occurs when biologically, your sexual ability has been compromised. Low testosterone is one of the main culprits in male sexual dysfunction.

Do you have a problem with physical arousal?

Do you have problems ejaculating?

Do you experience pain during intercourse?

These are all signs of sexual dysfunction, characterized by one or more problems occurring at any time during the sexual response cycle. The sexual response cycle traditionally includes:

- Excitement
- Plateau
- Orgasm
- Resolution

Desire and biological arousal both play important roles in the excitement phase of the sexual response cycle.

Sexual dysfunction is historically most common in men ages 40-60 years old, but with the recent widespread decline in testosterone levels - as much as 20% lower across entire populations according to some sources, compared to just 20 years ago - we are starting to see a disturbing trend even in men in their 20's and 30's, when most men are considered in the prime of their sexual health.

You may be one of these men.

If you are, worry no more. The fact that you're reading this guidebook is a big step in the right direction.

So what causes sexual dysfunction?

Sexual dysfunction can be caused by myriad things, but almost all of them boil down to a common source… the endocrine system.

Whether it's psychological stress from work or performance anxiety, causing a spike in circulating cortisol which will naturally suppress testosterone production, or alcohol and drug abuse, high levels of body fat, or depression, all of the common causes of sexual dysfunction can be resolved merely by optimizing your endocrine functioning via proper nutrition, training, and lifestyle.

And that should be quite comforting.

Because the fix is rather simple.

Sexual Desire

Sexual desire is a motivational state… an innate drive. An appetite. It is commonly referred to as libido, sexual drive, and lust.

On one level, it is the main element of an individual's sexual personality. For our purposes, it is a motivational state caused by both internal and external factors, one of which is your testosterone level.

The biological component of sexual desire is commonly referred to as 'drive' and has neurophysiological underpinnings.

Individuals with acute or chronic illnesses tend to have far lower sex drive than their healthy age-matched counterparts. This makes sense, as the body allocates attention from less important processes like appetitive sexual behavior toward more important processes such as survival.

However, chronically elevated stress hormones, even when undetectable to most, can have a profound impact on a man's sex drive, especially if they're elevated for prolonged periods of time... months and years.

Stress hormones (glucocorticoids) act as an androgen suppressant so as your chronic stress levels creep upward, your testosterone production will naturally decline.

While desire and function are inherently different processes, they are intricately intertwined. And testosterone heavily influences the overall system.

is more sex better?

1. More sex is indeed better for testosterone production.
2. However, more testosterone is NOT correlated with increased sexual desire or activity, with the exception of in men with abnormally low amounts.
3. The testosterone threshold is between 300-400 ng/dL, beyond which little to no increase in sexual desire or activity is noted.
4. There is a lot of individual variance in terms of the threshold's exact value.

Steroid Hormones and Behavior

The relationship between steroid hormones and behavior is complicated.

Endogenous hormone levels influence behavior, while behavior also influences hormone levels. So which comes first? And which exerts the most influence?

The answer: there is no right answer. It all depends on individual variance.

A quick story: a man works on an island. The man leaves the island to travel to the mainland, and while there he visits his girlfriend. The man has sex with his girlfriend, then returns to the island.

His beard grows thicker and faster than before. As he periodically returns to the mainland to visit his girlfriend, he begins to notice that his beard is growing more rapidly immediately prior to, and during, the visits.

This is a true story, and part of a publication that, in 1970, sparked a flurry of new investigation into the exploration of the relationship between testosterone and sexual behavior. It would appear as though both the anticipation of sex and the act of intercourse itself were increasing his androgen levels (evidenced by the enhanced secondary characteristic beard growth).

Testosterone can in fact rise due to psychological stimulation, such as that from sexual anticipation. It has also been found to positively correlate with orgasm frequency: in free testosterone, serum testosterone, and DHT.

So it would appear as though more sex is indeed better.

However, there are some caveats to consider. First, as mentioned in the “Sexual Intercourse & Masturbation” chapter, if the psychological guilt associated with the act of sex is high enough, the body’s stress response will negate any potential benefits, or at least have a negative impact on them.

Also, saying that more sex is better for increasing your testosterone is not the same as saying that more testosterone is better for having more sex.

The Testosterone Threshold

A threshold exists, beyond which an increase in testosterone levels has been shown to have a negligible effect on increasing sexual desire, arousal, and performance.

This level appears to be between 300-400 ng/dL in men and should be taken as the baseline level of testosterone that men need in order to operate with "normal" sexual drive (provided their free testosterone is not compromised).

Beyond this point, even in men with three times the amount of T, researchers see insignificant differences, or inconsistent enough differences, in terms of sexual activity traits to warrant the need for any additional T when it comes to sexual activity.

However, this is not to say that more testosterone is not beneficial for other things in a man's life such as support of his secondary characteristics like hair growth, vocal tone, muscle development, and well-being.

But it is an interesting, and hopefully encouraging piece of information to note.

Most men reading this, even with low testosterone in the 200's, should be able to restore baseline sexual functioning naturally by merely increasing their T into the 300-400 ng/dL range.

And my recommendation, obviously, is to do this without gels or medications. Testosterone production is based on feedback loops so with a small natural increase from behavioral, nutritional, and training changes you should be able to first restore baseline functioning, then positively reinforce that production so it increases steadily in time.

Another important thing to note is this: an increase in testosterone, even at or beyond the threshold required for baseline sexual activity, does not correlate with an increase in sexual activity.

And that's because testosterone levels have nothing to do with a man's ability to hold a healthy relationship with a partner.

That involves psychosocial skills, empathy, and a million other things, obviously all of which vary greatly from one individual to the next.

So yeah, just because you're a raging T-gorilla* doesn't mean you'll be able to close the deal. Sorry.

So all in all, androgens are only beneficial in terms of sexual activity and desire for men who currently have abnormally low T. But increasing your T is good for most guys, even beyond sex.

*There are inconsistent findings between testosterone levels and aggression.

masturbation

1. The brain is able to distinguish between interpersonal touch and intrapersonal touch quite well via mechanoreceptors in the skin
2. Hormonal response to interpersonal touch, along with the psychological elements involved and the increased capacity to regulate stress hormone reactivity would seem to indicate that sexual intercourse with a partner is indeed superior to masturbation for testosterone production
3. Prolactin secretion is orgasm dependent in the sexual response cycle, and acts directly back on dopaminergic neurons in the brain to regulate sexual satiety
4. Excess prolactin contributes to testosterone deficiency and erectile dysfunction, and is chiefly caused by pituitary tumors and a handful of common medications (if you're on meds, check this out)
5. Erotic film viewing linked with masturbation has been shown to increase circulating cortisol, possibly for psychological reasons, and is therefore potentially detrimental for short-term testosterone production at the neural level (and for long-term if performed chronically)
6. However, orgasm frequency, whether due to intercourse or masturbation is found to increase circulating levels of free testosterone, serum testosterone, and DHT

Author's Interpretation: Sexual intercourse is better than masturbation for enhancing testosterone production. However, there is a lot of individual variance that can occur from psychosocial variables.

For example, if the guilt associated with intercourse or masturbation is high enough, the subsequent stress response will negate any potential physiological benefits.

The Sexual Response Cycle

When considering sexual intercourse and masturbation, we can't focus merely on the physical act, and in doing so limit our scope to the genitals and ejaculation and/or orgasm; we need to understand the sexual response cycle in terms of the cerebral, spinal, and peripheral aspects, getting the full view.

Then, in that context we are able to understand the fundamental differences between having sex with a partner and masturbating alone, and subsequently posit testosterone's role as well as how it is affected.

The concept of sexual arousal implicates far more than just genital arousal. The "arousal cycle" involves a chain of events, both psychologically and physiologically: information processing, general arousal, incentive motivation, genital response, then coital (intercourse) or autoerotic (masturbation) action, followed (hopefully) by orgasm (and including all neuroendocrine events and cascades associated with these steps).

This process appears to be motivated by dopaminergic activation (dopamine being the neurotransmitter commonly associated with reward-motivation behavior) and proposed to be regulated by the prolactinergic system (prolactin being a peptide hormone associated with a huge number of things, one of them being feedback regulation on dopaminergic neurons post-orgasm, which implies a primary role in a possible negative feedback sexual-satiation mechanism).

This prolactinergic feedback occurs in response to ALL forms of orgasm, regardless of whether it is coital or autoerotic. However, the same response does not seem to occur in men who masturbate without orgasm. With those things in mind, it wouldn't seem to matter whether or not prolactin feedback is an important distinguishing factor or a "lead" in this testosterone investigation, right?

Wrong. Kind of.

Hyperprolactinemia is associated with two things (in men): impaired sexual desire (makes sense, seeing as we just learned about the negative feedback system, though it is only one small piece to the puzzle), and *testosterone deficiency*.

What?

Is this a chicken-egg issue? If so, how does excessive prolactin production inhibit testosterone production? This is where it gets complicated: should we assume that the PRL is inhibiting T production and not that excessive PRL is a by-product of less testosterone production in the first place?

Let's take a look.

Hyperprolactinemia induces hypogonadism (ie. low testosterone) by interfering with the secretion of gonadotropin releasing hormone (GnRH). Luckily, most forms of hyperprolactinemia are rare, and usually involve a prolactin-secreting pituitary tumor.

However, for the general population of men reading this program, you need to be aware of a handful of drugs (that you may be taking) that can induce hyperprolactinemia, and therefore inhibit testosterone production and cause sexual and/or erectile dysfunction.

Some common medications are:

- Dopamine antagonists (antidepressants, anti-emetics)
- Amphetamines
- Estrogens
- Methyldopa and levodopa (L-DOPA)
- Opiates; morphine
- Metoclopramide
- Prochlorperazine, Chlorpromazine (antipsychotic drugs)

Medically, hyperprolactinemia is managed with dopamine agonists, like bromocriptine.

Remember, after orgasm prolactin generally acts upon the brain's dopaminergic neurons. If we administer a dopamine agonist (opposite to an antagonist) then it

will have a positive effect on the normally negative-feedback cycle, which is especially helpful with an excess of PRL.

Long story short, if you suffer from ED, low libido, gynecomastia (man boobs), and also have some intermittent vision impairment and/or unexplained headaches, go to your doctor and get your prolactin levels screened.

Anything further on prolactin is beyond the scope of this book. Just know that addressing an issue with it (if you have one) will increase your testosterone levels back to normal.

Anyways, let's let a handful of questions guide us in this chapter with regards to masturbation:

1. What effect does autoerotic film viewing have (in real time) on steroid hormones (and is it any different than the coital sexual response)?

2. What effect does physical (non-*auto*erotic) touch have on stress and/or steroid hormones?

Before we get to those questions, however, I must make one important point: the body of research with regards to sexual activity and arousal relative to steroid hormones, pituitary hormones, and psychology is inconclusive, at best.

This is due to the incomprehensibly complex interplay between all the variables involved, including but not limited to testing paradigms and study design, circadian rhythms in subjects, sleep, diet, and subjectability.

Autoerotic Film Viewing

We begin an investigation into masturbation with the usual culprit - porn.

This, in my mind, is a logical place to begin because of the pervasivity of porn as a sexual arousal, and subsequently masturbation-encouraging, stimulus.

A group of scientists from the University of New England in Australia were curious about whether autoerotic film viewing could induce similar blood hormone concentrations as masturbation and sexual intercourse. They found a significant rise in blood pressure in test subjects while viewing the pornography, compared with the control group, but little else other than slightly increased transient prolactin levels throughout the viewing. Cortisol and adrenaline were unaffected, while noradrenaline levels increased slightly.

None of the test subjects reached orgasm, and prolactin levels were therefore nowhere close to other studies that showed similar prolactin increase post-orgasm between masturbation and intercourse.

This reinforces the idea that the prolactin increase is entirely orgasm-dependent, regardless of stimulus, and that autoerotic film alone does little other than stimulate routine sexual arousal. In terms of hormonal effects, it has little negative impact on stress hormones.

However, autoerotic film linked with masturbatory orgasm specifically was found to significantly increase plasma cortisol levels following orgasm, which is likely a by-product of the normal experience of psychological guilt that stems from this sequence of activity.

Following sexual intercourse with a partner, plasma cortisol is unaffected.

Plasma testosterone levels have also been found to be unchanged following masturbation, even with a rise in FSH during the orgasm phase, while plasma T levels have been found to be either unaffected or increased leading up to and following sexual intercourse (see how inconclusive this all is?).

In summary, masturbation-induced orgasm has been found to have little effect

on GH, T, B-endorphin, and LH levels with only slight variance in FSH and prolactin levels during/post-orgasm and a transient increase in noradrenaline levels throughout.

In terms of testosterone and visual erotic stimuli, it's been found to either increase or be unchanged - but not negatively affected with viewing. Use that knowledge as you will.

The Science of Interpersonal Touch

The skin is the oldest and largest of human sensory organs. Therefore, it would make sense that we examine the relationship between interpersonal touch and steroid hormones so we can extrapolate those findings into a logical conclusion with regards to advantages or disadvantages to one form of orgasm-induction over another.

The big question we need to answer is, "Is there any clear advantage with relation to the element of interpersonal touch during intercourse over the solitary action of masturbation in terms of steroid hormones?"

The brain distinguishes between interpersonal and intrapersonal touch, and elicits separate hormonal responses accordingly.

The importance of touch in romantic relationships is almost unanimously agreed upon. So much so, in fact, that some researchers even go so far as to assert that love and interpersonal touch are indivisible.

This would lead us to believe that touch plays a rather large role in eliciting an oxytocin (OT) response in both genders, which is a major player in the sexual arousal cycle. In animal studies, centrally administered OT induced erection, an effect that was apparently testosterone dependent. And OT-blockers stopped all noncontact erections.

Direct sexual contact from a partner has been found to induce the highest OT response.

Researchers also believe that the apparent ability of dopamine agonists to enhance sexual response is due to dopamine's relationship with oxytocin in this respect.

Also, in studies done on stress responsiveness, subjects who were exposed to massage from their partner (who they were either married to or had been cohabiting with for at least 12 months prior to testing) demonstrated significantly less cortisol responsiveness to the controlled laboratory stressor than the other groups.
In males, lower cortisol generally correlates with healthy testosterone levels.

Sexual intercourse is favorable over masturbation in terms of both testosterone production and stress hormone regulation. And not just for reasons discussed so far.

Another important consideration is the psychological assertion of dominance in a situation, which has been shown to increase male testosterone considerably, and is something that cannot be achieved in masturbation.

Even if masturbation and intercourse with a partner were comparable in terms of hormonal responsiveness, I'd still argue that the psychological act of sex itself for the male is more likely to elicit its own hormonal response, dependent on performance.

For example, if the male experiences anxiety during intercourse (an unlikely scenario during masturbation) and subsequently underperforms during sex, his testosterone is likely to be lower than if he were to just masturbate.

However, if the male performs well (to his own judgement) and subsequently feels dominant and like intercourse was a successful endeavor, then his testosterone levels post-intercourse are likely to be considerably higher.

body language

Yes, a simple posture hack will have a large scale impact on your testosterone and cortisol levels.

Almost immediately.

Amy Cuddy, a social psychologist at Harvard Business School gave an eye opening TED talk in 2012 on the subject of using your body language to shape who you are, or more appropriately... who you want to become.

Body language is dependent on non-verbal cues.

However, the majority of research on non-verbals has historically focused on non-verbals as perceived by outsiders. For example, how your body language governs how other people think and feel about you.

But the really important question isn't that, but rather: do our non-verbals affect how we feel about *ourselves*?

We know that our brains can change our bodies, but is it also true that our bodies can change our brains? Our hormones?

Yes.

And interestingly, in the research, Cuddy and company found that the main hormonal markers that played roles in these non-verbal dynamics were testosterone and cortisol.

A hormone that influences dominance levels, and a hormone that governs stress reactivity.

In primate hierarchies, the alpha male always has high levels of testosterone and low levels of cortisol. In dominant, effective leaders, we also find - almost across the board - high levels of testosterone and low levels of cortisol.

This means the leaders are not just hard-charging testosterone juice heads, but also have low stress reactivity. They're flexible and cool under pressure.

The researchers found that with a couple quick physical manipulations, changes you can implement in mere minutes, their test subjects were able to considerably increase their testosterone levels and decrease their cortisol. Again, in *minutes*.

Not days, weeks, or months.

They ran a series of tests with a group of subjects, measuring testosterone and cortisol levels before and directly after the subjects made some simple changes. And the results were significantly different.

Now imagine if you were to integrate these simple physical hacks into your everyday life, eventually just making them a part of who you are. Sounds great, right? It is.

So what are the hacks?

1. Change your role
2. Change your posture

Let's look at these further.

First, change your role. What is your role in life? How do you identify yourself? Do you think of yourself as dominant, as a leader, as a power player?

Or do you think of yourself as a pawn? Are you just a cog in the machine?

It doesn't matter if you actually are just a cog in the machine, most of us are in some respect. What does matter is how you perceive your life situation and your social role in that situation.

In primate hierarchies, when a lesser male is forced to take over the role of alpha male in the society, within a matter of days his testosterone levels are significantly increased.

He's the exact same animal, the same being, he just changed his role. And his hormone levels compensated for that change. They rose to the occasion, so to speak.

So what does this mean for you?

Take a few minutes to reflect on your current role in life. If you're experiencing low testosterone, or symptoms of low T, is there a time in the recent past when you can recall a role change, and did that have an effect on your not just your outlook, but your biology? On your health?

If so, how are you going to change that? Now that you understand this, you are faced with the opportunity to alter your role to better suit your endocrine health.

Here's my recommendation: take on more responsibility. Increase the amount of risk in your life, with an equally measurable increase in potential for reward. Higher testosterone males are generally far less risk averse, and that's not just a consequence of their predetermined biology. It is possible for you to increase your testosterone and/or maintain its current level, by placing yourself in certain social and life situations. Change your role and your circumstances.

If what you're doing right now isn't working for you, what is holding you back from making the necessary changes?

And if you've always considered yourself a beta, or maybe just never considered yourself an alpha male, then give it a shot. Change your role - upgrade, in your own mind (because that is where all change begins), your role to alpha male and stop being so submissive.

Don't be one of those pseudo-alpha douches though. We've all seen them. The guys who walk into the bar with their chests puffed out, acting macho. Being an alpha male is not about acting macho to compensate for your insecurities. It's about feeling secure with who you are, and not letting anybody else threaten that security.

Cuddy et al. found some incredible results with a simple posing experiment, and that leads us to this next point... change your posture.

The researchers had a group of test subjects come into the lab, spit into a vial (for saliva testing) then assume several different posture positions for 2 minutes before spitting into another vial (for post test results).

The results: the subjects who assumed what the researchers termed "high power" positions (ie. spreading out, becoming physically bigger by standing straighter, or with hands on hips and power pose with legs) saw a whopping 20% increase in overall testosterone levels (in minutes)! They also saw a 25% decrease in cortisol.

So increase your testosterone by 20% and decrease your cortisol by 25% by just standing or sitting in a more powerful position. Assume a position of dominance with your body, and your brain will "rise to the occasion."

On the flip side, those test subjects who assumed the "low power" positions (ie. sitting with legs crossed, arms crossed in front of themselves for protection, slouching, touching their neck, looking at the floor, etc) saw a 10% immediate *decrease* in testosterone and a 15% *increase* in cortisol!

So two minutes can literally configure your brain over the short-term to either be assertive, confident, and comfortable or stress reactive and feeling shut down and vulnerable.

So yes, your body can change your brain.

Beyond just integrating a role change and some more assertive posturing into your everyday life, I believe most guys can benefit from specifically using these quick hacks in situations where your dominance might be compromised.

Again, don't be a douchebag, but just be deliberate.

If you're giving a speech in front of an audience, or a presentation in a boardroom to a group of executives, take that opportunity to be deliberate with your non-verbal cues, not just for the sake of how your audience perceives you, but for yourself.

See it as a challenge and rise to the occasion. Be assertive and protect your inner level of security by not compromising your alpha male status.

Stand tall, deliver your speech powerfully, don't succumb to 'low power' poses, even when your body might naturally gravitate toward them.

Again, be deliberate.

Over time, with continual practice, the way you sit, stand, and move in your everyday life will transition to "high power" and away from "low power." And this will actually increase your testosterone and lower your cortisol quickly and predictably.

So keep that tool in your back pocket.

jobs

Your job might be destroying your testosterone production.

Symptoms of andropause (ie. depression, low libido, lack of energy, erectile difficulties) have been studied in men with relation to psychological job-related stress, and research shows some interesting findings.

This entire paradigm clearly demonstrates how important psychology is to your health.

Symptoms of andropause, according to the research, can appear independent of testosterone levels. Researchers have found men with both normal and low testosterone to experience these symptoms.

The main culprit is psychological stress, much of it lifestyle and job-related.

So if you work a stressful job, this is a crucial area of your life to address. You need to learn proper psychological coping mechanisms as well as make sure the rest of your life is handled fairly well in terms of nutrition, training, lifestyle, and relationships.

However, men with lower testosterone in general are at considerably higher risk for andropause symptoms, especially with exposure to high-stress job environments, which can elicit depressive symptoms, insomnia, and musculoskeletal problems alone, in otherwise healthy men.

In a study in Japanese men working in stressful job environments, researchers found that, almost across the board, the subjects were more likely to be obese, have high cholesterol, have tension related to anxiety and depression, and suffer from chronic lower back pain.

Sound familiar?

I know I've felt many of this in my own life: first in college, then during my first start-up company post-college.

Luckily, many of these symptoms can be beat with proper nutrition, training, and sleep. However, taking the correct psychological measures is vital as well, otherwise much of your progress with the other aspects will be in vain.

Unfortunately, you may have more cards stacked against you than you realize, however.

Even the building you work in could be negatively affecting your testosterone production.

Yes, researchers have actually linked "building-related sickness" and the chemical impact traditional office and school buildings have on people with negative correlations in stress-related blood hormone levels.
Another, often overlooked influence over your psychosomatic stress levels is technology, especially technology commonly found in work environments.

A Swedish study followed a large group of skilled IT workers at Ericsson Laboratories over a 6 month period of training.

They chose this group of individuals as test subjects, as opposed to "normal" office workers exposed to technology, because Ericsson engineers are highly-skilled and completely immersed in technology, both psychologically and physically.

No convincing correlations have yet to be linked between purely physical exposure to technology and negative effects other than reported eye strain from screen exposure and occasional headaches.

However, when studying a group of subjects who make a living building computer architecture, we're able to more accurately gauge the impact technological psycho-stress may have on an individual because engineers will have far less psychological stress related to routine computer handling than an average office worker with limited technological prowess, who may become highly stressed even when they need to make a spreadsheet or perform simple tasks.

In this particular study, the researchers had workers go about their normal routine over the study duration, and split them into groups. They were specifically studying how effective certain stress-management techniques were on the individuals.

Quite obviously (in my opinion) stress management techniques proved to be more successful over the course of the study in terms of regulating psychological stress as well as some biological markers such as prolactin and blood pressure. However, and this is the one result that they chose not to elaborate on in the discussion section, total testosterone levels dropped considerably in test subjects over the 6 months.

Interesting.

Because the researchers failed to comment on this (important) issue in the study, we are left to craft our own hypothesis. I think this drop may either be 1.) routine, and normal for these individuals and/or related to work-specific events not mentioned in the study itself or 2.) reflect the nature of the individuals who, normally in control of their domain and more likely to function best when left alone, felt disturbed by the presence of researchers in their life, prodding with giant questionnaires and attempting to teach stress management. It may have demasculinized them slightly. Again, just speculation.

So, can technology directly affect your testosterone levels negatively?

By itself, probably not - there has been no convincing evidence to support the claim.

However, technology, especially in the work environment, may be a significant contributing factor to additional stress, both psychological and physical, which could have an adverse effect on your testosterone levels as a downstream consequence of chronically elevated glucocorticoid levels and poor lifestyle decisions such as sacrificing sleep and practicing poor posture when using the computer, for example.

Also, two things to pay specific attention to with respects to your work environment, and these are more common sense than anything but I might as well reinforce some good thinking: be wary of your nutrition habits in the office, and take positive steps to improve stress during your commute.

1.) Nutrition in the office: Offices are notoriously bad places for trying to eat well. From the snack machine and extreme stress and/or boredom, to Lisa from Accounting always bringing those damn Dunkin' Donuts Munchkin donut holes in all the time, you just need to pay attention and stick to your guns when it comes to making the best decisions.

Processed flour and sugar are not your friend.

See the nutrition chapter for detailed information on the best way to eat to optimize your T production.

2.) Commuting: Even if you don't experience road rage, which is clearly stressful for everybody involved and an unhealthy habit and personality pattern, commuting hours to and from work every day, by train, car, airplane, or bicycle, can be an additional source of chronic stress, contributing to chronically-elevated cortisol levels.

Physically, you're kind of stuck. You need to physically get to work, unless you quit jobs and find a better one that is closer to home (or even negotiate a way to work from home). It's difficult to get around the fact that physically your body is going to need to undergo this additional stress on a daily basis.

However, as we've seen so far in the program, and will continue to see, your mental attitude, posture, and actions can have direct effects on your physiological conditions.

So while you may physically be stuck in that car for 2-3 hours per day, you can make the best of the situation psychologically and practice mindfulness, pray, listen to enjoyable music, listen to the Road To Ripped podcast (or your other favorite podcasts to turn it into an enriching experience), and any number of other positive mental activities.

It may not seem like much, but you'll be surprised at the effect small changes like these can have on your overall stress levels, especially when combined with proper nutrition, training, sleep, and a healthy lifestyle in general.

free T vs. total T

This section is vitally important for you to read if you want to fully understand how to maximize the effectiveness of the testosterone in your system.

Free testosterone is different from total testosterone.

So what's difference?

Well, if you can recall the discussion earlier on SHBG (Sex Hormone Binding Globulin) you'll remember that SHBG binds specifically to androgens.

When testosterone is SHBG-bound (or bound to any other molecule or protein) it can no longer be utilized by other tissues.

Free testosterone is unbound, and active in the bloodstream. It can travel to the necessary tissues and exert its effects on them.

You should strive to have a balance between free and total testosterone levels. Some individuals have normal testosterone levels, but super low free testosterone. This may leave them perplexed if they do not know how little free testosterone they have, and they will very likely still experience the common symptoms of low testosterone such as low libido, trouble losing body fat, low muscularity, trouble sleeping, depression, and low well-being.

The conventional wisdom would say to simply take measures to lower your SHBG levels in order to increase your free testosterone.

If you search on the "male vitality" or "anti-aging" forums online for SHBG issues you'll almost immediately come upon countless threads where guys talk about all of the drugs they're taking to lower their SHBG levels.

This is overly simplistic in its approach, and for many guys even ends up

lowering their overall T levels even further.

How can that happen?

Well, the part of the equation that they're neglecting to remember is that SHBG doesn't only bind testosterone. It is an androgen binding protein, therefore it will also bind estrogen.

If you take a drug that specifically inhibits binding (or production) of SHBG, then you will also increase the amount of free estrogen in your bloodstream, which will negatively impact your testosterone levels.

Bad news.

So what should you do instead?

Well, SHBG is produced in the liver. An abnormal amount of SHBG in the bloodstream, binding androgen molecules to the point of negatively affecting your testosterone levels indicates that your liver is out of balance.

The most important thing to do at this point is address your liver health.

Specifically, stop drinking alcohol for a while, and use intermittent fasting with pure water as way to allow your body a specific amount of time every day to heal itself. Depending on how ****ed-up your liver is, this may take months, and it may take years before things are fully restored to homeostatic levels. However, just make small steps forward, progressing slowly while you take the other necessary steps in terms of nutrition, training, and lifestyle.

You'll see an upward trend over time.

If you have a specific known liver disease then now you know that it is likely the cause of your low free testosterone levels as well. Cirrhosis can be caused several ways, including very serious conditions like hepatitis and chronic alcohol abuse. Your liver will also be ravaged from tumors, liver cancer, cysts, fatty liver disease (caused by obesity in general), parasitic infection, portal vein thrombosis, and bile duct obstruction. These conditions require professional medical attention beyond the scope of this program.

Some warning signs that you may be experiencing liver problems are:

Jaundice, discolored skin and eyes (yellowish), abdominal swelling and pain, dark urine, pale stools, itchy skin, bloody stools, chronic fatigue, loss of appetite, and chronic nausea.

See a doctor to run some lab tests to check on your liver health if you think this may be the issue.

Also, and potentially a very likely cause of liver imbalance, is excessive acetaminophen (ie. Tylenol) intake. Acetaminophen is in many over the counter medications (so check the label before ingesting). The fact that it is seemingly benign makes it even more dangerous because you are more likely to consume excessive amounts - enough to damage your liver.

Acetaminophen causes free radical damage by creating a hydrogen peroxide foaming, depleting the liver of glutathione, its primary defense against free radicals.

So just be careful. If you regularly consume acetaminophen, reduce your intake or find an alternative.

The good news...

If you take the necessary steps in this program and apply the knowledge you learn to your everyday life, you'll naturally bring your endocrine system back into balance, which will in turn encourage liver balance (if you're not in an extreme medical case as noted above).

You will, over time, optimize the ratio of free T to total T, bringing it all back into balance so your body can operate the way it should, and your "low T" symptoms will gradually disappear in the process.

cold showers

1. There is little evidence to directly correlate cold water immersion with testosterone increase.

2. There is, however, a theoretically sound hypothesis in support of it - the body of research just doesn't yet support the claims beyond anecdotal evidence.

3. There is a ghost study floating around on the internet that claims testosterone increase with cold water immersion, yet nobody actually links to it, and it doesn't exist in any reputable academic journal databases.

4. Short-term cold water therapy is very healthy for humans for its anti-depressive effects, metabolic increase, and proposed leptin enhancing effects.

So what's the deal with cold showers?

Cold water immersion gets a lot of play, both in popular books as well as internet articles and forums, for increasing testosterone production in men.

But does all the hype actually stack up with the evidence?

Unfortunately, no.

At least not in terms of direct scientific research that demonstrates convincing evidence of testosterone increase itself.

However, cold showers and/or short-term cold water exposure can be good for your health in general, for other reasons, but we'll get back to that shortly.

Here's the deal, everybody and their mother cites a 1993 study by the "Thrombosis Research Institute" as implicating cold showers with a direct increase in testosterone levels.

However, after hours of scouring the internet for this study, I could not even find the damned thing. I searched far and wide, first in reputable academic databases like Pubmed, Google Scholar, JSTOR, Science Direct, and Wiley, then in Google search, forums, and blog articles.

Nothing.

The study doesn't appear to exist, at least not online.

So what gives?

Well, at first glance this appears to be a case of he-said-she-said.

One blogger or author hears about something on a forum, "cites" a study, writes an article on it, then another blogger picks it up and cites it, then the spark ignites and the unfounded information runs rampant across the internet.

While it may actually be true - short term cold water immersion may actually improve transient testosterone production - I unfortunately will not explicitly recommend it, or recommend against it, due to the fact that I have never read any evidence to support this claim. I'm not going to jump on the bandwagon just because it is popular.

However, there is evidence that points to *prolonged* cold water exposure as having negative stress effects on non-cold-adapted rats, with decrease in testosterone levels being one of the outcomes. And negative effects of prolonged cold exposure in non-cold-adapted humans has been reported as well.

And if we pull our heads out of the books for a second and think about it, prolonged cold exposure in a human who is not adapted to it generally leads to one thing... hypothermia.

In terms of cold water immersion, here's how things work:

- Short-term immersion (5-10 minutes): positive effects (discussed below), though little to no evidence of testosterone production beyond speculation
- Proper cold-adaptation via steady habituation: adaptive responses such as increase in subcutaneous fat level (seen in many long distance pool swimmers, and especially in cold water distance swimmers - not necessarily preferable)
- Long term cold exposure in non-adapted individuals (20+ minutes): negative stress effects, potentially decreasing testosterone levels due to increase in glucocorticoids

Noradrenaline has been shown many times to increase significantly with cold exposure. This is actually the main mechanism of action that scientists credit for the perceived anti-depressive effects of cold water therapy on subjects.

The short-term cold (or cool) water exposure increases blood levels of beta-endorphin and noradrenaline, also increasing synaptic release of noradrenaline in the brain. The immersion of the palms and feet in the water, areas with very high concentration of heat sensory receptors in the skin, would theoretically send a large amount of neural impulses to the brain to accentuate this process.

However, researchers acknowledge that the body of research is quite small in terms of cold water therapy acting in this manner and they call for wider and more rigorous study before conclusive arguments can be made.

One hypothesis might be to speculate that since noradrenaline increases substantially with short term cold exposure, and since noradrenaline acts on the preoptic area of the hypothalamus, which, as we already know, is the site of excretion of GnRH, which stimulates the pituitary to release LH which leads to testosterone production, that ice baths will increase testosterone production.

Due to our knowledge of noradrenaline's regulatory nature on the GnRH secretion pathway, this may be a sound hypothesis.

It may work.

The body of research on this is minimal, at best, however. So for results, you'll need to conduct n=1 studies on yourself.

Many anecdotal reports confirm the benefits of short cold or cool water immersion on perceived libido enhancement, which may indicate a testosterone increase.

In terms of my own experience, I have intermittently used 10-minute cool water baths with 2-3 ice packs after hard training sessions for recovery, and underwent this process a significant number of times over the period of the last few years as I increased my testosterone levels so drastically.

However, I did it specifically for either muscle recovery from training or because the occasional cool bath invigorates me, and I'd be lying if I claimed to do it specifically to increase my testosterone.

I can neither deny nor confirm that the cool water baths had any impact on my overall testosterone levels, sadly. Though this is definitely an area for some direct home-testing experimentation in the future.

Other cold water benefits include an increase in metabolic rate, as well as proposed contributions to restoring homeostatic leptin levels (in Dr. Jack Kruse's "Leptin Reset"), with other promising results for chronic fatigue syndrome, chronic heart failure, and some types of cancers - even a hypothesis for anti-tumor immunity.

So it is definitely something you may be interested in trying out.

Remember, short-term exposure to cold or cool water for 5-10 minutes is all you need.

can you grow taller?

With height playing a prevalent psychological (and possibly evolutionarily programmed) role of importance in many cultures around the world, it comes as no surprise that many guys focus on how tall they are, and deem it an area of their life worth attention.

Is it worth the attention?

That is an individual decision, and one made based on preferences, so only you can decide that.

However, I'd like to explore the idea a little bit and look at the realistic possibilities in terms of increasing height.

I do not want to breed any unrealistic expectations though, so this exploration will be cut-and-dry, based on facts and not outlandish marketing claims like you may see on internet marketing-based "how to grow taller" products.

Anecdotally, in my own experience, I grew 2 inches from the time of beginning my journey with testosterone optimization, switching my training, nutrition, and lifestyle around.

Beyond the training, nutrition, and lifestyle elements, I attribute this to two things:

- My age
- My genetics

Age-wise, all of the additional growth occurred before I was 25 years old (I am 24 years old at the time of publication). 25 is the proposed age around which most men will stop growing entirely, but there is probably some slight variance between individuals.

This is due to full maturation of the growth plates.

Growth plates, formally known as epiphyseal plates, are cartilage plates at the end of your long bones that are responsible for bone elongation during maturation, which for men usually ends in the mid-20's, when the epiphyseal plate becomes an epiphyseal line.

Without getting too much into the biophysiology, the constant mitotic division of cells causes an aggregation along the epiphyseal end of the cartilage, causing it to "grow" over the adolescent years, with old cells stacking up along the main shaft of the long bone (referred to as the diaphysis).

The estrogen:testosterone ratio is very important in determining growth potential, with a higher proportion of estrogen during adolescence causing increased apoptosis (cell death) of the cells that eventually would become new bone. This slows down, and eventually halts growth, so it is very important for young males to optimize this ratio by controlling their estrogen production.

Once the growth plates mature, the only known way to technically "grow taller" is to surgically elongate your long bones via a procedure known as distraction osteogenesis, which is literally a surgical fracturing of the bone and attempt to regrow new bone in the gap. Ouch.

The second powerful determinant of height is genetics.

If you are younger than 25 years old, and are wondering whether or not you even have any additional growth potential, then use the following formula to determine it:

- Mother's height (inches) + Father's height (inches)
- Add 5 inches (for men), subtract 5 inches for women
- Divide by 2

The answer is your predicted growth potential, with a standard deviation of 4 inches on either side.

For me, I've currently reached my genetic potential according to this algorithm, by adding the 4 inches standard deviation to my predicted height. Considering my current height and my age, I do not expect to grow any more.

However, like anything, this probably isn't 100% accurate for every person. Some outliers always pop up.

In terms of what you can do to optimize your potential if you are young enough and think you may still have genetic potential for additional height.

First, get your diet and training correct. Use this program.

Growth hormone production is crucial, and just following the guidelines laid out in the nutrition and training chapters will put you on your way to optimize this.

Also, sleep as much as possible.

Deep sleep is the most important time in your circadian cycle for growth hormone secretion. It's no wonder early adolescent boys have been known to sleep for up to 15 hours at a time (myself and my brother included) and eat like animals while awake.

Also, don't be a fool and take anabolic steroids in high school.

I played football and baseball with a group of guys who took steroids starting from age 16. Sure, they were strong - they could hit home runs and score touchdowns - but at what cost?

Anabolic steroids have been shown to stunt new bone growth in teens as well as lower spermatogenesis, not to mention elevate blood pressure and increase risk of heart attack. One study actually found that teens with asthma (who take oral steroids via their inhalers throughout adolescence) are, on average, half an inch shorter than kids who are treated with steroids.

Additionally, posture may play an important role.

Beyond adding a solid inch or two instantly, depending on how much you slouch currently, purposeful, powerful posture has been shown to transiently increase your testosterone production within minutes (see the chapter on body language). While this may not directly translate into bone growth, it definitely helps with confidence, and when reinforced over time, could be an important component in increasing your T levels along with nutrition, training, and lifestyle adjustments.

male pattern baldness

- Dihydrotestosterone has been commonly (mainstream medicine) implicated in male pattern baldness.
- This theory is thought to be overly-simplistic and "lazy."
- The real culprits, aside from genetic factors, are cortisol, prolactin, and estrogen, which all play important roles (at supra-homeostatic levels) in the calcification of the skull bone, restricting blood flow to the scalp and hair follicles, which, over time, causes hair loss.
- Vitamin K, D, magnesium, and sodium levels should be checked if you suffer from pattern baldness traits and you should take adequate measures to control cortisol, estrogen, and prolactin levels via proper training, nutrition, and lifestyle (ie. this program).

"Yet the absolute serum androgen concentrations in men with a disposition to balding is lower than in men with no reduction of scalp hair. The widespread assumption that androgen levels are in general elevated in bald-trait men must therefore be rejected. In accordance with this finding, men with a disposition to balding are morphologically (with regard to anthropometric measures) no more masculine than those with good scalp hair growth." Knussman et al.

Conventional wisdom purports that higher level of androgens (ie. testosterone) in the bloodstream makes men more susceptible to male pattern baldness.

Like most conventional wisdom, not only is this assertion brutally oversimplified, it's just plain wrong.

(Hat tip to Danny Roddy of DannyRoddy.com for pointing out just how wrong the mainstream perception is about this issue, and for doing so much continual research over the past decade).

In order to properly understand this issue, we must start at the beginning.

In 1942, a doctor by the name of James B. Hamilton began doing research experiments with androgen administration on eunuchs (castrated men) and eunuchoids (men with dysfunction testes).

Before androgen administration, in their eunuch state, subjects had no issues with balding.

When testosterone was administered, 4 of the subjects, with a family genetic history of balding, began balding. When the exogenous testosterone administration was halted, balding stopped as well. Resuming testosterone administration triggered balding once again, and so on and so forth.

The "testosterone must cause balding" hypothesis was born, as was further evidence to explore genetic factors in balding.

The good thing this set of experiments did show doctors and researchers was that balding is heavily influenced by the body's hormonal environment. As Danny Roddy puts it, "In other words, balding isn't a genetic death sentence."

From this set of data, we can see that castrates are, for some reason, protected from balding. And it would appear this protection is androgen-related.

However, castration, along with offering protective qualities against balding, also encourages what researchers refer to as 'feminization,' attributing feminine behavioural qualities to the men. This is a curious distinction though because eunuchs have notoriously low estrogen levels.

So what causes the feminization?

Roddy proposes that the hyperactive pituitary functioning in eunuchs causes LH to produce more progesterone, a hormone known to oppose the effects of testosterone and estrogen. This, he purports, is the cause of the feminization - and the protection against balding.

The most probable theory of baldness claims that baldness is the direct effect of abnormal calcium deposition, not high (dihydro)testosterone levels.

Calcium deposits in the skull inhibit blood flow to the diploic veins, which reach through the foramen and travel to the skin on the scalp. With inadequate blood flow, the scalp follicles shrink, resulting in hair loss over time.

The first thing most people will assume when they hear about calcification in this light, is that they need to decrease their intake of dietary calcium. This is completely ill-founded. Dietary calcium has as much impact on your intracellular calcium levels as dietary cholesterol has on your endogenous cholesterol levels. Probably even less.

Proponents of this “Ivory Dome” Theory advise increasing dietary vitamin K intake, along with taking certain measures in terms of nutrition and lifestyle to decrease your estrogen and prolactin levels to healthy homeostasis (hint: if you follow the advice in this program you will naturally be taking these measures already).

Vitamin K deficiency renders a protein called osteocalcin unable to bind calcium, and another protein called MGP, which is stimulated by vitamin K2, is the most powerful calcification antagonist known to researchers.

Moral of the story: get sufficient vitamin K via your diet.

However, this story is not over yet.

Cortisol, estrogen, and prolactin are also power players in this theory.

An excess of polyunsaturated fat (arachidonic acid) along with chronically-elevated lactic acid in tissue induces a compound that increases production of the aromatase enzyme, which is responsible for estrogen synthesis.

As cells become hypotonic, prolactin production increases in an effort to leach nutrients from bone, since the cells themselves are effectively in an energy crisis.

Hyperprolactinemia leads to osteoporosis, and this can be seen in many women, but excess estrogen also feeds back into hyperprolactinemia as well.

Increased prolactin levels lead to molting of fur and feathers in animal tests, with estrogen producing the actual vascularization to the now-featherless areas. They work hand-in-hand.

Hyperprolactinemia also increases production of parathyroid hormone, which leads to calcification.

The best dietary ways to lower parathyroid hormone are to consume vitamin D, K, magnesium, and sodium. Don't take abnormal amounts, just make sure you're getting enough. If you must, get your vitamin levels tested via blood tests.

Excess estrogen also leads to an increase in cortisol-induced bone catabolism. Interestingly, cortisol is found to be "significantly elevated" in men and women with pattern baldness.

Cortisol, in this respect, acts to increase levels of a hormone called aldosterone, which in turn depletes magnesium and calcium, leading to an increase in parathyroid hormone. Aldosterone was also found to be significantly higher in pattern hair loss patients than in control subjects.

So what does all of this mean?

It means testosterone (more specifically dihydrotestosterone) has been unfairly implicated in male pattern baldness due to oversimplified examination of the subject.

The real culprits, aside from genetic factors, are cortisol, prolactin, and estrogen, which all play important roles (at supra-homeostatic levels) in the calcification of the skull bone, restricting blood flow to the scalp and hair follicles, which, over time, causes hair loss.

Vitamin K, D, magnesium, and sodium levels should be checked if you suffer from pattern baldness traits and you should take adequate measures to control cortisol, estrogen, and prolactin levels via proper training, nutrition, and lifestyle (ie. this program).

BPA

Out of all of the special topics discussed in this program, BPA, or bisphenol A, is one of the most widely-studied and unanimously agreed upon endocrine disruptors. It is also one of the most pervasive chemicals on the planet - leaching into the human body from nearly all polycarbonate plastic products, drink containers, sporting equipment, dental resin composites and sealants, epoxy resins, lining of food cans, and polyester resins.

It is literally everywhere, and is almost guaranteed to be having a negative influence on your endocrine system, specifically your testosterone levels.

Some researchers have gone so far to claim that, when reviewing the epidemiological data for developed nations, general consensus has agreed that BPA can be detected in a majority of the individuals in these nations, and they extrapolate that it is a major cause of the increased incidence of infertility, genital tract abnormalities, and breast cancer prevalence observed in the US and Europe over the last five decades.

BPA is what is known as a xenoestrogen, binding to estrogen receptors in a similar manner to endogenous estrogens. And while it is considered a “weak estrogen,” with 10,000 to 100,000 times weaker binding affinity than estradiol, its potency rivals that of estradiol, acting in far lower concentrations with similar efficacy.

BPA, while “weak” by definition, can act in a wide variety of pathways, which, coupled with its environmental pervasiveness, leads to a potent effect on human endocrine functioning.

BPA has been shown to decrease sperm production and hyper-stimulate prolactin release, as well as inversely correlate with gonadotropin levels. Not good news for us guys, especially considering that in one 2001 Japanese study on the effects of BPA on sex hormones, serum BPA concentrations at baseline

were found to be significantly higher in the normal men than in normal women.

They hypothesized that the presence of endogenous testosterone in men, being considerably higher than in women, acted to suppress the metabolism of BPA in the body, implicating the two in a vicious cycle with one another, with BPA also acting as a potent SHBG ligand, disrupting the natural androgen-to-estrogen balance.

These findings are corroborated with evidence of higher BPA in women with polycystic ovarian syndrome (PCOS), who are known to have considerably higher testosterone levels than normal women.

What does this mean?

It means that, as men, we are at significantly higher risk of the negative effects of a chemical like BPA on our endocrine functioning - it is far more likely to disrupt our androgen-to-estrogen balance.

Two studies on BPA exposure in young children are actually somewhat scary. Researchers detected BPA in indoor and outdoor air samples at a preschool, floor dust, play area soil, and food and drink samples, both at the preschool building and at home.

They verified that BPA can be found in more than 50% of indoor air, food samples, baby & hand wipes, and solid and liquid food samples, with an estimated 99% of child exposure coming through a typical child's diet (think about all of the packaging for infant and toddler foods, not to mention the processing and plastics contained in common children's treats and snack foods).

Beyond being somewhat horrifying, this illustrates the inconvenient truth that almost every individual reading this book has most likely been exposed to considerable levels of BPA in his/her environment from a very young age, with those of us in our 20's, 30's, 40's and 50's accumulating large, and in some cases momentous, amounts of compounded exposure to a chemical that our bodies have a difficult time metabolizing, and that has a potent binding effect on our estrogen receptors, decreasing gonadotropin production and acting antagonistically to our natural levels of testosterone.
So what in the hell can we do about it?

Common sense answer: reduce your exposure to BPA in your immediate environment.

This is a classic case of learning to worry about only what is in your control, and not what you cannot control.

Can you control the amount of BPA in the air around you? Or in your office building environment at your job?

Yes and no.

If you move out of the city into the countryside and quit your job, yes.

If uprooting your entire life isn't an option, then no.

Instead, focus on the things you can control. They actually will have a noticeable effect on your day-to-day exposure.

For example, in my own life, I began drinking only from glass bottles and BPA-free Nalgene style water bottles, trying to limit the amount of drinks I was buying that came in disposable plastic containers.

Same goes with foods.

Less frozen meals and more fresh foods and meats.

I stopped eating canned foods almost entirely (not a difficult thing to do - they generally taste pretty horrible anyways).

Much of your exposure to BPA comes via your diet, via foods and liquids you are consuming and the containers they are packaged in.

Luckily, you can 100% control your diet, and getting rid of BPA-ridden food and drink containers also means you're eating natural, vitamin-rich foods that will nourish your endocrine system and lead to more fat loss and overall vitality in general.
Great.

This is a list of the most common civilized items that contain BPA.

- Canned foods (for example, Campbell's soups. BPA is used to line the cans) - you can avoid this by buying your canned foods from retailers like Trader Joe's, Eden Foods, and Muir Glen
- Polycarbonate plastics (bottles, sporting equipment, eyeglass lenses, and helmets. Pro tip... it is marked with a number 7)
- Soda bottles DO NOT generally contain BPA (safer plastics are marked with a 1 ,2 or 4)
- Store receipts (the thermal paper used to print store receipts contains BPA, and most people come into contact with it several times per day)
- Airplane boarding passes
- Bus tickets
- Lottery tickets
- Recycled paper (recycling is evil after all)
- Pizza boxes
- Toilet paper (!!NO!!)
- Newspaper Ink (If you still actually subscribe to a physical newspaper and don't read it online, then you finally have another good reason to make the switch)
- Old water pipes (if you live in an old house or apartment, either get these checked or filter your drinking water... not sure what you should do about the shower though)
- Dental bondings & cavity fillings (yes, the chemical is probably seeping into your skull... fun)

Just avoiding this list of things will have a considerable impact on your endocrine health and put you on your way to optimizing your testosterone levels along with everything else in this program.

Hopefully this chapter served as an eye-opener to just how nuanced this topic may be, but how simple it is to avoid certain "silent" environmental causes of your low T symptoms that you may otherwise never have known to exist.

alcohol

- Alcohol ravages your endocrine system, acting directly in your testes to halt testosterone production
- However, dosages matter
- Under 1g/kg bodyweight, alcohol consumption has been shown to have either no effect on testosterone levels or to actually transiently increase it
- When combined with full body training in the 5 rep range, post-training alcohol has been shown to protect against free testosterone uptake, keeping blood levels of free T elevated during times when they normally fall
- Beer contains potent phytoestrogens that act antithetically to testosterone
- Drink more liquor

Can you still drink alcohol?

What kind of alcohol should you drink?

How bad is alcohol, exactly?

These are all good questions, and in this chapter we'll answer them, and I'll explain in more detail the down-and-dirty about alcohol.

The good news: you can (and should) continue to drink.

You just need to operate within certain guidelines when it comes to your consumption: with timing, type of alcohol you consume, and amount.

The first thing you must understand is...

Alcohol causes damage

Alcohol's damaging effects are nuanced, and not at all straightforward, when it comes to the endocrine system, testosterone in particular.

The body of research demonstrates how important dosages are in this song-and-dance. The two most important things you must know are:

- Dosages matter
- The type of alcohol you consume matters

We'll discuss those in more detail shortly.

Alcohol's damaging effects are mediated at all three levels of the HPG axis. In the hypothalamus, some evidence points to alcohol having an inhibitory effect on the testosterone's feedback influence with regards to secretion of a hormone called LHRH (luteinizing hormone regulating hormone). Some studies demonstrate an effect, others do not.

It would appear, however, that the hypothalamus is the least vulnerable point in the axis to alcohol's negative effects.

The pituitary, on the other hand, doesn't fare so well.

Under normal low testosterone circumstances, we would expect the pituitary to increase its activity in terms of gonadotropin release as a compensatory mechanism. However, alcohol has been shown to suppress this action, which clearly leads to further potentiation of the low testosterone levels.

In the testes, alcohol directly acts to inhibit testosterone secretion. The exact mechanism is, at this point, unknown. However, scientists have a handful of interesting hypotheses about why this might occur.

The first involves opioids.

Testicular opioids acts as messenger molecules that inhibit testosterone synthesis. The common opioid known as beta-endorphin has been shown to increase in both the testes and hypothalamus in response to acute and chronic alcohol consumption. Scientists believe it may be directly responsible for suppressing testicular testosterone synthesis as well as suppressing LHRH production in the hypothalamus.

Opioids have also been known to increase occurrence of a process known as apoptosis, or programmed cell death. At the testicular level, this would result in the death of the Leydig cells and seminiferous cells, resulting in drastically lowered testosterone production and sperm cell quality and quantity.

In terms of evidence supporting this hypothesis, treatment of male rats with an opioid antagonist after acute alcohol consumption was shown to prevent the alcohol-induced testosterone suppression.

The next hypothesis involves nitric oxide (NO).

NO is synthesized in the testes by an enzyme known as NO synthase (or NOS). NO production is thought to increase under the influence of alcohol, and when blocked by NO antagonists, researchers showed a protection against testosterone suppression associated with alcohol consumption.

Oxidative stress also appears to play an important role in alcohol-induced gonadal testosterone suppression.

Oxidation is a natural part of the process of alcohol metabolism. It generates by-products called oxidants that are known to contribute to cell damage. To avoid oxidative stress, the body needs a natural balance between antioxidants and oxidants (hence the endless recommendations in pop science/nutrition to eat more antioxidants).

When an imbalance occurs, with the influx of oxidant by-products (especially under alcohol-induced stress) the oxidative stress causes rampant cell damage to body tissues. This is a well-known mechanism for liver tissue damage in alcoholics and binge drinkers.

Oxidative stress caused by alcohol consumption has been shown to cause cell death in the heart, central nervous system, and testes as well.

The feeling of nausea after drinking is caused by a by-product of alcohol metabolism known as acetaldehyde. Acetaldehyde is actually thought to be the chief testosterone-suppressing agent in this process because it inhibits a key enzyme in testosterone synthesis.

Researchers have found that men with alcoholism and hypogonadism actually eliminate acetaldehyde more efficiently than normal men, ridding them of most nausea. While this might seem appealing on the surface, it actually puts men with low testosterone at higher risk for drinking problems, aside from the other risk factors such as depressive and anxiety symptoms, and lower well-being.

Researchers believe alcohol-induced oxidative stress to exert its effects upon cell membranes in the testes, since they're known to be rich in fatty acids, a common target for free radicals.

Vitamin A supplementation through dietary means has been shown to protect the testes from alcohol-induced oxidative injury.

Dosages Matter

To this point, alcohol sounds pretty damn bad.

However, like I said earlier, it's not straightforward.

Researchers have actually found that in dosages under **1g/kg bodyweight** in men, testosterone levels actually *increased* (or remained unchanged) after drinking.

Hallelujah!

For reference, a 12 oz beer is equal to about 14g of alcohol. This means that for me, a 200lb (90kg) guy, I could drink 6 beers without feeling the negative ramifications of the alcohol. And my testosterone levels may actually transiently increase during this period of time.

However, as we'll discuss shortly, beer is probably not the best choice.

The 'sweet spot' per se, in terms of number of drinks, appears to be in the 2-3 drink range. Researchers found that the amount of blood ethanol increase caused by 2-3 liquor drinks was just enough to facilitate what they called a "competitive environment" in the liver between alcohol oxidation and steroid hormone oxidation, with the alcohol oxidation winning out, leaving an increased level of non-metabolized testosterone (which would otherwise have been broken down into androstenedione), increasing the ratio between the two steroid hormones.

And this causes an overall increase in testosterone levels.

In all cases, however, beyond alcohol consumption of 1g/kg bodyweight, test subjects, both animal and human, demonstrated ravaging negative effects of alcohol consumption, especially with respects to their HPG axis and testosterone production.

So moral of the story: dosages matter, a lot.

Keep your drinking under 1g/kg bodyweight, with the sweet spot (for an acute increase in testosterone levels) at the 2-3 drink range, depending on your bodyweight.

Alcohol and Resistance Training

Most research looks either at resistance training and its effect on testosterone, or alcohol and its effect on testosterone.

I managed to dig up some information on the combined effects of alcohol and resistance training on testosterone levels.

I was eager to find this mostly because almost all guys reading this program, and putting it into action, will be undergoing a resistance training protocol in tandem with social drinking (hopefully now in the 2-3 drink range).

So if that sounds like you, you're going to like what I found.

Normally, in response to full body resistance training, testosterone levels will transiently rise, with free testosterone levels falling quickly at two periods of time post-training: at 60-120 minutes post-exercise, and 140-300 minutes, before resuming homeostatic levels.

Researchers found that, in young men training with full body resistance (all major muscle groups worked) in the 5 rep range (3x5 to be specific) that post-training intoxication (.83g/kg) actually led to an *elevation in free testosterone levels* during these two specific periods of time (60-120 minutes, and 140-300 minutes).

The researchers speculate that the alcohol may temporarily block the normal uptake of this free testosterone.

At first glance this seems great.

And it may be... under intermittent circumstances.

One word of caution, however, is to remember that the unnaturally elevated levels of free testosterone caused by alcohol consumption may actually lead to a long term decline in free T because more of it will be exposed to metabolic processes.

So my recommendation: train in the late afternoon if you're going out to have a couple drinks with friends later in the evening. If you train, then go straight to dinner and drinks, you will likely experience both this quick transient increase in testosterone levels associated with the alcohol, as well as the reliable transient increase in T levels (total and free) that comes after full body resistance training.

How To Drink On Your Training Days:

- 1pm - Meal
- 6pm - Training
- 730 - 1030pm - Large dinner and drinks (2-3) with friends

What is the best type of alcohol to drink?

Good question.

It's not beer.

The main ingredient in beer is hops. Hops contain two compounds that act antithetically to testosterone: 8-PN and xanthohumol.

8-PN is a super potent phytoestrogen. It is so potent that it has been shown to reduce hot flashes in menopausal women and researchers have expressed concern over women picking hops by hand because it gives them menstrual disturbances. Wow.

Xanthohumol, while it may have protective qualities against prostate cancer, its mechanism of action is to protect your prostate by blocking testosterone.

So pick your poison.

I'd rather avoid the xanthohumol and protect my prostate in other ways that I know won't directly block T production.

Know this: I do drink beer intermittently, and over the past few years of learning all of this information, have continued to drink it. Why? Because I like it. I think it tastes good and some days it's just really refreshing.

The important thing to realize is that you don't need to be perfect with these things. Continue operating by the 80/20 and leave that 20% for some wiggle room. If you want the occasional beer, and your training and nutrition and other lifestyle factors are on point, then have a beer. Testosterone production isn't going to come to a screeching halt if you drink a beer or two. Just avoid chronic binge drinking and/or don't drink it daily.

So what are some good options for drinks?

Liquor.

Men should drink liquor.

Avoid sugary cocktails and sweet wines and just get a hard drink, either:

- Straight
- On ice
- With water
- With soda water

Dry red wines are fine as well, and are especially beneficial for their high potency antioxidants.

Just keep it simple.

Remember: simplicity is your friend when it comes to drinking.

2-3 drinks of liquor will allow you to experience the beneficial effects of the alcohol and the relaxation of a nice buzz, while simultaneously allowing you to avoid the negative stress ramifications and hormonal malfunctioning that occurs when you get drunk.

cheap testosterone testing

Some insider knowledge for cheap testing is to go to a local hormone replacement or anti-aging clinic.

Many of them will provide testosterone testing for FREE. However, some of them are beginning to catch onto the fact that a good number of guys are going in just for the free tests and they're now charging around $100 per test, which is still pretty inexpensive, so this might be a good option. Just run a Google search in your area for an anti-aging clinic.

Also, if you have good health insurance, the best option is probably just to go into your primary care physician and have them run a comprehensive blood and hormone panel for you. In most cases the only additional cost will the be office's co-pay, which could be only around $10-20.

For most guys with corporate jobs and stable insurance policies, this is a good option. Note: *primary care physicians will generally be cheaper than going directly to a specialist like an endocrinologist.*

There are some decent options online for mail-in testing. I've compiled a list below for your convenience...

PrivateMDLabs.com: http://www.privatemdlabs.com/lab_tests.php?view=all

Notable:

- Male Hormone Panel - $169.49
- Male Hormone Panel with Free & Total Testosterone and SHBG - 149.99
- Male Hormone Panel with Free & Total Testosterone and SHBG and Thyroid - 219.99
- HRT Follow-up Panel - 159.99
- Human Growth Hormone - 49.99
- LH - 44.49
- Estrogens (Total) - 49.99
- FSH - 44.49
- FSH & LH - 54.99
- Progesterone - 44.49
- Prolactin (PRL) - 44.49
- SHBG - 49.49
- Testosterone, Free & Total - 89.49
- Total Testosterone - 44.49

Life Extension:
http://www.lef.org/search/product-category.blood-tests/index.aspx

Notable:

- Male Comprehensive Hormone Panel Blood Test - Members 299.99, Retail 398.66
    - Chemistry panel (complete metabolic panel with lipids)
    - CBC
    - DHEA-S
    - DHT
    - Estradiol
    - PSA
    - Pregnenolone
    - Total and Free Testosterone
    - Sex Hormone Binding Globulin (SHBG)
    - TSH
    - Free T3
- Cortisol AM/PM Blood Test - Members 72.00, Retail 96.00
- Total & Free Testosterone - Members 99.00, Retail 132.00

WellnessFX - http://www.wellnessfx.com/

WellnessFX is a very cool new health-tech startup. You have the option of different packages, and even an eCheckup. Plus they offer expert consultation services.

I recommend picking up their "Performance" package, since it includes testing on all of the following, and is the only package that includes the steroid hormone profiles, and it runs around $500:

- Total Cholesterol
- HDL
- LDL
- Triglycerides
- Lp(a)
- ApoB
- TSH
- Glucose
- HbA1c
- BUN
- Creatinine
- AST
- ALT
- Total Bilirubin
- Albumin
- Total Protein
- Vitamin D
- Calcium
- Sodium
- Potassium
- Chloride
- Carbon Dioxide
- hs-CRP
- CBC
- Ferritin
- Total Iron Binding Capacity
- Folate
- Vitamin B12
- RBC Magnesium

- **DHEA**
- **Free Testosterone**
- **Testosterone**
- **Estradiol**
- **SHBG**
- **Cortisol**
- **IGF-1**
- **Insulin**
- T4
- T3
- T3 Uptake
- Free Thyroxine Index
- Free T3
- Reverse T3
- Free T4

Talking20 - http://www.talking20.com/

Talking20 is another cool health-tech startup. You order kits online and the mail the testing kit straight to your home. You prick your finger and take the blood sample, then mail it back to them. They will display your test results online in your account shortly thereafter.

They have several options for packs. The $99 U-pick single pack includes one pack and you can choose from the following options:

- Total Cholesterol
- Estradiol (Estrogen)
- Progesterone
- Testosterone
- Homocysteine
- CRP
- HgA1c
- Cortisol
- Vitamin A
- Vitamin B6
- Vitamin B9
- Vitamin B12
- Vitamin C
- Vitamin D3
- Vitamin E

The more economical solution is to buy one of their multi-packs with 24 or 36 packs for 995.00 and 1295.00, respectively. Then you can test as often as you like with only constraint on the amount of packs you have. This could be really helpful for testing multiple times per week or day, or if you want to do more detailed analysis of your hormonal profile under different circumstances like dietary changes or training influences.

The Plans

The Training Plans

The Training Plans

The training plans are split up into three different levels of proficiency and are designed to progress over the course of 6 months.

With 6 solid months of training correctly using NM-based explosive resistance training, activating high volume of muscle tissue over each workout, along with proper balanced nutrition according to the principles laid out in the nutrition section of this program and/or in the sample menus, you will see a very noticeable increase in your testosterone levels, far more balanced hormone levels in general, and a powerful, athletic and aesthetic physique.

Since neuromuscular style training can be difficult, and quite different from other types of training in terms of muscle load, please use the following benchmarks to properly determine which level of training progression you should begin at.

Remember, there is NO shame in starting with the beginner program. You'll see great results from any of these. Just pick the one that will properly challenge you over this next 6 months.

As a note: these programs are based around building explosive power and muscle density through calisthenics and weighted calisthenics movements, depending on your skill level. However, I also include options for using barbell movements to achieve similar goals, and I've tried to set these up so it is simple for you to customize your sessions to best fit your preferences and access to training equipment.

Beginner: This is a great starting point for anybody. The goals include working your way up to 5x5 reps of bodyweight pull-ups, chin-ups, and parallel bar dips in a session. If you cannot yet do this, then you need to start with this training program.

During the middle of the program, you begin working with weighted (very light) calisthenics movements, building up your power and muscle density. By the end of the 6 months you will have great control over your body weight and be highly proficient in basic calisthenics movements. Your body will be powerful and strong.

Intermediate: You must be able to do 5x5 bodyweight pullups and dips in a session no problemo in order to begin this progression correctly. If you cannot yet do this, then please start with the beginner progression and work your way up.

The goal in the first 3 months of this progression is to work your way up to doing pull-ups/chin-ups and parallel bar dips with 1/8 of your bodyweight, and eventually 1/4+ of your body weight.

You will also be working an explosive sprinting/burpee session into your week aptly named “The Terminator.” It’s fun.

By the middle to end of this progression you will be able to do explosive pull-ups and your first pistol squat, do weighted calisthenics with over 1/4 of your bodyweight, and develop a very strong core through full body hanging bar work.

Advanced: To begin this progression you must be able to do explosive pull-ups (at least 3-5 in a row, per set), pull-ups, chins, and dips with 1/4-1/2 of your bodyweight, pistol squats, and be ready to do your first muscle-up within a few weeks.

If you can do muscle-ups already, then that's outstanding. You'll be able to advance more rapidly.

We'll also begin working with one of my all-time favorite shoulder-back-chest movements, *Korean Dips*, and develop raw jumping power with weighted box jumps. By the end you will be doing weighted muscle-ups like a boss. Your muscles will be dense, you will be powerful and athletic, and you will have ample control over your body and be far stronger than almost anyone you'll meet.

How the progressions are organized:

Workouts are not effective if you don't do them. And part of why most people stop training the way they should is boredom. I've attempted to design these progressions in a way that will eliminate boredom by allowing you to customize your weeks based on how you feel on a particular day, or series of days.

As you plan, remember to remain flexible. For example, if you planned to do wind sprints on Wednesday, but Wednesday comes and you really would rather focus on building your pulling power instead, just sub out a different session from the options.

Each progression - beginner, intermediate, and advanced - is laid out with a series of different workouts for every period, with specific goals in mind (you'll see when you look through the progressions).

Use these session suggestions to craft your ideal training schedules.

I do recommend that people train one of two ways...

1. In a train-rest-train-rest cycle: For example...

- Workout A
- Rest Day
- Workout B
- Rest Day
- Workout C
- Rest Day
- ...

... and not necessarily worry about weekly scheduling. This is ideal for those of you who would like to remain very flexible and somewhat spontaneous in your training yet still get in killer shape.

To be honest, scheduling training around 1 week seems rather arbitrary to me, and not completely necessary (though it is still very effective). I recommend this train-rest cycling for people who are willing to explore other options, since the weekly programming cycle appears to be based merely on social or societal norms and not necessarily on the best programming for optimal training.

2. Weekly training cycle: However, it is still very effective, and most likely very practical for people who work traditional jobs and need to schedule out their week ahead of time and know that certain days of the week involve more commitment and less wiggle room than others.

This is simple and nearly everybody reading this will understand how to schedule this way.

I recommend training 3-4 sessions per week, depending on how rested and rejuvenated you feel. Especially at the beginning of these training programs, as your body begins adjusting to the new stimulus, you will likely be very sore, and need additional recovery time (for example, some of my clients end up needing intermittent naps during the first 2 weeks as they adjust. This training will exhaust you in a whole new way if you're not used to it).

Here is an example week:

- Monday: Workout A
- Tuesday: Rest Day
- Wednesday: Workout B
- Thursday: Rest Day
- Friday: Workout C
- Saturday + Sunday: Rest Days (and/or sports and games with friends and family or outdoor chore activities like chopping wood)

You don't always need to take a rest day between sessions, however. Though I do recommend you stick to the 3-4 sessions per week still, so your body recovers well and you get plenty of rest and don't overtrain yourself.

Here's another example week you could use where you double up your sessions back-to-back:

- Monday: Rest Day
- Tuesday: Workout A
- Wednesday: Workout B
- Thursday: Rest Day
- Friday: Rest Day
- Saturday: Workout C

- Sunday: Workout D

Rest Days

Rest days are the holy grail of endocrine optimization. Quick story...

Years ago when I raced triathlon competitively, I rarely EVER took a rest day. I'd train 7 days a week and an "easy day" of a 60 minute jog or a 60-120 minute bike ride (or both) was considered the same as a rest day.

So yeah, somehow I still rationalized that 2 hours of training that day was "recovery" since my normal training days were 4-6 hours in length and involved all 3 sports and some form of strength training (the joys of being a student with no real responsibility). No wonder I would wake up some nights in cold sweats at the peak of training and racing season - I wasn't actually recovering at all. I was just telling myself otherwise.

This type of high volume training works great for performance over the short term if your muscles can handle it. With triathlon you get fast as hell for a season, until you can no longer handle the training stress... then you implode.

Eventually I began having trouble with stubborn body fat and anxiety. I was used to eating 5-6000 calories a day, so when I could no longer train so much, I began packing on the pounds. I was exhausted and getting chubby, then fat. It was demoralizing. Plus I was on meds that were screwing with my endocrine balance and brain chemistry. Long story short, I stopped all that training and began resting often.

Now I rest 3-4 days a week, taking a 30-90 minute walk in the evening if I have the time (as a time to think and wind down from the action of the day), I train properly and eat properly and I rarely get anxiety, I sleep like a bear in hibernation, and maintain 9-10% body fat all year-round, basically effortlessly.

Proper rest is the hinge around which everything else turns.
So, on your rest day, walk.

Just go out for a nice relaxing walk if you have the chance. Walking is rejuvenative and burns a couple hundred additional calories per day with no additional stress on your system (though I recommend not thinking about it in terms of calories burned and just view it as a way to relax).

You'll get addicted to walking the same way most endurance athletes are addicted to running or cycling, only walking is actually good for you and won't hamper your ability to lose unwanted body fat - it will help it.

Walking should be the cornerstone of your training program moving forward. Even if you don't have access to a gym, equipment, or you don't have the energy to bust out a session, just go for a walk and you'll still be just fine.

Warm-ups and cool down:

I recommend just dynamic stretching and jump roping for a total of 5-10 minutes. Use this period of time to get your muscles warm and relaxed, prepped for the training to-come.

This is not a strict period of time, so don't treat as such. This is not about burning calories and you don't get a trophy or a gold sticker if you do more jump rope swings than your workout partner. The entire focus of the warm up should be warming up and getting your muscles loose, and your cooldown should be focused on loosening them back up after a challenging session so you don't get stiff later.

Both warm-ups and cooldowns should not take more than 5-10 minutes.

Equipment you will need:

You don't necessarily need access to a gym to get the full effect of this program. It's designed in a way that you can always sub-out movements for similar alternatives if you do not have the necessary equipment.

However, I suggest you own, or have regular access to, the following things in order to do this correctly. If that means buying something new then so be it. Don't skimp on your health. You already invested in this program (thank you) so if you need to grab a couple pieces of equipment then you should:

- Jump rope: I have this one and I love it.
- Pull-up bar and parallel dip bars: If you do not have access to a park, or a gym membership, a kickass option is to either build your own bar like I did or to pick up a power tower on Amazon.com.
- Weight belt (essential and inexpensive)
- **A box, ledge, stairs,** etc to jump up on for explosive box jumps
    - Best to do this outside, plenty of options - no need to buy one of those expensive crossfit boxes
- A grassy field or a local school track for sprint training

Note: While each section will begin with descriptions of the movements involved, most of these movements are demonstrated in full color pictures by yours truly in my free book that I give to all of my fitness blog subscribers over on NoGym.net, called No Gym, Perfect Body.

If you would like the free book and all of the exercise demonstrations along with a sizeable amount of additional information on keeping your endocrine system and gut health with training and nutrition, just subscribe to the free newsletter. Thousands of people have downloaded it over the last year.

I gave all of the workout sessions fun names because I like having fun, and you should too. Training is fun, and shouldn't be some super serious chore. Enjoy yourself - it's hard to take yourself too seriously when you're doing a workout session nicknamed 'Brotato' or 'McLovin'.

Time of day: While it is optimal to train in the afternoon or evening due to circadian cycles, you'll be just fine to train in the morning as well... if you drink a cup of coffee beforehand. Why, you ask?

Caffeine ingestion has been found to counteract the morning circadian rhythm performance drop associated with neuromuscular training. Check out the study here: http://www.ncbi.nlm.nih.gov/pubmed/22496767

So get up in time to grab a cup of strong tea or coffee, or for the utilitarians, shotgun a dose of caffeine anhydrous with some warm water, before your training session if you need to get it done in the AM.

The Training Progressions

Beginner

The Movements:

Here are video + photo demonstrations of all the movements in the beginner program. Use this as a reference if you don't understand the movement based on its name:

Pull-up: No kipping! It's pointless. Focus on form and even contraction: http://www.youtube.com/watch?v=utjNyrxIgA4 < Al gives some very good recommendations for helping work your way to pull-ups as well. This video is filmed in my old training grounds in NYC, Tompkins Square Park.

Chin-up: Al also demonstrates the chin up in the same video as above.

Parallel Bar Dips: http://www.youtube.com/watch?v=HcntlwvyTKU

Push-ups: http://www.youtube.com/watch?v=FxBj8kmj-ZI

Box Jumps: http://www.youtube.com/watch?v=hxldG9FX4j4

Divebomber: For an enjoyable video to watch (and pause) use this tutorial: http://www.youtube.com/watch?v=66-v0AaANHk

For a utilitarian tutorial that you'll only want to watch once, check out this one: http://www.youtube.com/watch?v=ttk8RdiIHzA

Jump Roping: http://www.youtube.com/watch?v=0Gu3WrJopB4

Bodyweight Squats: http://www.youtube.com/watch?v=p3g4wAsu0R4

Hanging Knee Raises: http://www.youtube.com/watch?v=PGSKkNB1Oyk

Hanging Leg Raises: http://www.youtube.com/watch?v=hdng3Nm1x_E

Dip Bar Knee Raises: http://www.youtube.com/watch?v=nv5r7k5KPHc

Plank Hold: http://www.youtube.com/watch?v=pSHjTRCQxIw

BEGINNER/FUNDAMENTAL SESSIONS:

1. Old Faithful:

- Warm-up
- Chin-ups: 5 sets of 5 reps (5x5)
- Parallel bar dips: 5x5
- Pull-ups: 5x5
- Divebombers: 5x10
- Cooldown

Notes: Obviously you will not be able to complete the 5x5 for these if you are a beginner. Old Faithful is what I refer to as a benchmark training session, the session you should always go back to every week or two to measure your progress and work on the most important movements.

As you work your way up to being able to complete this session, use assistance in the movements. For example, slide a chair or a bench underneath your pull-up bar or dip bars and do as many reps as you can until you need assistance, then step lightly on the bench or chair and use your leg for assistance to complete the 5x5.

Also, you can jump up on the bar, and let's say you can only do 3 reps in the beginning... after those 3 reps, drop down and use a set of heavy resistance rubber exercise bands to do a set of 5-10 additional pulldowns in a similar movement (for example, for chins, keep your palms facing upward toward you).

Fling the band over the pullup bar and pull downward, getting on a knee (keeping your back straight and posture good) if it helps add additional resistance).

2. Brotato (Chest & Shoulder Focus)

- Warm-up
- Push-ups: 5 sets of 50% your max (eg. you can do 50 pushups at once, so 50% would mean you should be doing 5 sets of 25 push-ups)
- Parallel Bar Dips: 3-5x5 (this movement is the cornerstone of this session. The pushups are a warm up for dips. Remember to work toward your goal of 5x5 good, controlled dips. By week 6-8 this should be really easy).
- Divebombers: 5x10
- Shoulder Press: choices...
    - Dumbbell overhead press, 3-5x5, two arms (eg. one 25lbs DB in each hand)
    - Dumbbell overhead press, downward ladder with one arm at a time (eg. 7 reps left arm, 7 reps right arm, 6 reps left arm, 6 reps right arm, 5 reps... etc), begin with a weight that you can complete the entire sequence downward beginning at 7, then add weight as you get stronger over weeks
        - Be sure and stagger your feet for more support
        - Keep your posture straight and engage your core
        - You can do this with a kettlebell as well
    - Military press, 3-5x5, use a barbell (use a weight that challenges you but you can still finish the prescribed setsxreps. Work your way up over the months).
- Cooldown

3. Usainity (Sprint Day)

- Warm-up, skipping, light jogging (prepare your body to sprint - a couple burpees helps)

- Bounding (push off and "bound" with big leaps, easy not forceful) 3x50m
- Wind sprints, 5x100m
    - Bound/stride the first 25m and at that point explode out into a full-out sprint for the remaining 75m
- Cooldown

4. Darth Sidious (Explosive Legs & Abs)

- Warm-up
- Box Jumps, 5x5
    - In terms of height recommendations, if you've never done box jumps start small. Don't start on a box you cannot complete the session on. You'll end up with bloody shins.
    - Focus on performing this session at a height that will challenge you every set, but not leave you unable to finish. (eg. You can do about 5 reps of jumps on a 36" box or ledge before pooping out. I'd recommend you begin this training on a 24" box, then work your way up to doing it on a 36" box over the months).
- Bodyweight squats, 5x20
    - Slow and controlled
    - Feet shoulder width apart, bring your ass to your calves before returning upright
- Hanging Knee Raises, 3x5
    - Watch the video for pointers on proper form
- Plank Hold, 3x60 seconds
- Jump roping, 10 minutes (doesn't have to be continuous, just get in some solid jump rope work)
- Cool down stretch and walk for 10 minutes, shake out legs

5. Pullllll (Pulling Strength Focus)

- Warm-up
- Hanging Knee Raises, 5x5

    - Use this time to hang and elongate your spine, relax your shoulders
- Chin-ups, 5x5
- Plank Hold, 3x60 seconds
- Pull-ups, 5x5
- Iso-holds, 3x30-60 seconds
    - With neck just over bar, hold your body in a pull-up position
- Cooldown

6. Baloo

- Warm-up
- Push-ups, 5x50% your 1 set max
- Hanging Knee Raises, 5x5
- Divebombers, 5x10
- Push-ups, 5x50% your 1 set max
- Hanging Knee Raises, 5x5
- Cool down

7. Big Johnson

- Warm-up
- Plank hold, 3x60 seconds
- Pull ups, 5x5
- Explosive Box Jumps, 5x5
- Pull ups, 5x5
- Explosive Box Jumps, 5x5
- Cool down

8. Charlie Sheen

- Warm-up
- 100 Divebombers, take rest every 10-20 if needed
- Bodyweight Squats, 10x20 controlled, ass-to-calves
- 50 Divebombers

- Chin-ups, 5x5
- 25 Divebombers
- Bodyweight Squats, 3x10
- 10 Divebombers
- Cool down

9. Bro Namath

- Warm-up
- Hanging Leg Raises, 5x5
- Parallel Bar Dips, 5x5
- Chin-ups, 5x5
- Parallel Bar Dips, 5x5
- Chin-ups, 5x5
- Cool down

10. Anakin

- Warm-up
- Bodyweight Squats, 5x20
- Bounding, 3x25m
- Sprinting
    - 3x200m
    - Ease your way into an explosion at 100m-to-go (eg. progressively get faster during the first 100m then at the 100m line explode forward into an all-out sprint for the second 100)
- Pull-ups, 5x5
- Cool down

11. Sweetish Hill (Hill Sprinting)

- Warm-up
- Bounding, 3x25m
- Hill Sprints, 5x50-100m
    - Find a hill of moderate grade (ie. not so steep that your fingernails get dirty) that you can power up hard for 50-100m
    - Walk back down and recover just enough to do the next set hard again
    - Practice good form and posture
- Jump Roping, 5-10 minutes
- Walk 5-10 minutes

12. Coffee Stains (Burpees)

- Warm-up
- 50 bodyweight squats
- Burpees, 5x10
- Jump rope for a minute to loosen up
- Burpees, 4x10
- Jump rope for a minute to loosen up
- Burpees, 3x10
- Jump rope for a minute to loosen up
- Burpees, 2x10
- Jump rope for a minute to loosen up
- Burpees, 1x10
- Cool down

Note: This session does not necessarily need to be a HIIT session, though it can be if you want. However, if you aren't in the mood for vomiting then there's no need to push yourself super hard and rush back into each set. Depending on how much time you have, take a solid 90-120 seconds for recovery between bouts so you can go hard again every time.

Weeks 1-8

GOAL: To build up to 5x5 in pull-ups, chin-ups, and parallel bar dips by week 8.

EXAMPLE WEEK:

- Monday: Old Faithful
- Tuesday: Rest
- Wednesday: Usainity
- Thursday: Rest
- Friday: Brotato
- Saturday and Sunday: Rest, Walking

*Feel free to customize your schedule however you like, using the following 5 session templates.

USE THESE SESSIONS:

- Old Faithful
- Usainity
- Brotato
- Darth Sidious
- Pullllll

Weeks 9 - 16

GOAL: Continue with first goal of 5x5 in pull-ups, chins, and dips, and now make steady progress into weighted variations of these three movements in the 5 rep range by adding 2.5-5lbs to them every 1-2 weeks.

EXAMPLE WEEK:

- Monday: (Weighted) Old Faithful
- Tuesday: Rest
- Wednesday: Baloo
- Thursday: Rest
- Friday: Big Johnson

- Saturday and Sunday: Rest

*Feel free to continue working the sessions from weeks 1-8 into this period of time as you please, especially if you particularly enjoy one or two of them. Add weight to the pull-ups, chins, and dips if you can.

When adding weight, use your weight belt and add plates in increments of 2.5-5 lbs every week or two, depending on how quickly you progress.

USE THESE SESSIONS (along with the first 5, and weighted variations):

- Baloo
- Big Johnson
- Charlie Sheen
- Bro Namath
- Anakin

Weeks 17-24

GOAL: Continue working on incrementally increasing your weighted pull-ups, chins, and parallel bar dips every week, ideally using Old Faithful or Pullllll as training sessions routinely. Now we will begin integrating some more explosive conditioning with burpees.

EXAMPLE WEEK:

- Monday: (Weighted) Pullllll
- Tuesday: Rest
- Wednesday: Squidward
- Thursday: Rest
- Friday: Coffee Stains
- Saturday: Rest
- Sunday: Sweetish Hill

*Feel free to continue working the sessions from weeks 1-16 into this period of

time as you please, especially if you particularly enjoy one or two of them. Add weight to the pull-ups, chins, and dips if you can.

When adding weight, use your weight belt and add plates in increments of 2.5-5 lbs every week or two, depending on how quickly you progress.

USE THESE SESSIONS (along with the first 10, and weighted variations):

- Sweetish Hill
- Coffee Stains

Intermediate Program

The Movements:

Here are video + photo demonstrations of all the movements in the intermediate program. Use this as a reference if you don't understand the movement based on its name:

Pull-up: No kipping! It's pointless. Focus on form and even contraction: http://www.youtube.com/watch?v=utjNyrxIgA4 < Al gives some very good recommendations for helping work your way to pull-ups as well. This video is filmed in my old training grounds in NYC, Tompkins Square Park.

Chin-up: Al also demonstrates the chin up in the same video as above.

Parallel Bar Dips: http://www.youtube.com/watch?v=HcntlwvyTKU

Push-ups: http://www.youtube.com/watch?v=FxBj8kmj-ZI

Box Jumps: http://www.youtube.com/watch?v=hxldG9FX4j4

Divebomber: For an enjoyable video to watch (and pause) use this tutorial: http://www.youtube.com/watch?v=66-v0AaANHk

For a utilitarian tutorial that you'll only want to watch once, check out this one: http://www.youtube.com/watch?v=ttk8RdiIHzA

Jump Roping: http://www.youtube.com/watch?v=0Gu3WrJopB4

Bodyweight Squats: http://www.youtube.com/watch?v=p3g4wAsu0R4

Hanging Knee Raises: http://www.youtube.com/watch?v=PGSKkNB1Oyk

Hanging Leg Raises: http://www.youtube.com/watch?v=hdng3Nm1x_E

Dip Bar Knee Raises: http://www.youtube.com/watch?v=nv5r7k5KPHc

Plank Hold: http://www.youtube.com/watch?v=pSHjTRCQxIw

Hanging Leg Raises: http://www.youtube.com/watch?v=ZG66zhtQ8b8

Pistol Squats: http://www.youtube.com/watch?v=XcHuJ1UBiCA

High Pull-ups: http://www.youtube.com/watch?v=Mc2rvfxBILk

Explosive Pull-ups: http://www.youtube.com/watch?v=hhpRf9pVlLQ

Burpees: http://www.youtube.com/watch?v=_43ezrGPwIg

Clean and Press: http://www.youtube.com/watch?v=UqZGpLeWanI

Incline Bench Press (can use bar or dumbbells):
http://www.youtube.com/watch?v=wsCi4OnQ-xs

Deadlift: http://www.youtube.com/watch?v=iid8r-CVK-o

INTERMEDIATE SESSIONS:

1. (Weighted) Old Faithful:

- Warm-up
- Weighted Chin-ups: 5 sets of 5 reps (5x5)
- Weighted Parallel bar dips: 5x5
- Weighted Pull-ups: 5x5

- Divebombers: 5x10
- Cooldown

Notes: Assuming you're beginning this program with the ability to do 5x5 in pull-ups, chins, and parallel bar dips, then you'll be doing this session weighted. Begin with a weight (use a weight belt) that challenges you but still allows you to finish the session. Add 2.5-5 lbs of weight to the belt every week to two weeks. Old Faithful is what I refer to as a benchmark training session, the session you should always go back to every week or two to measure your progress and work on the most important movements.

2. (Weighted) Brotato (Chest & Shoulder Focus)

- Warm-up
- Push-ups: 5 sets of 50% your max (eg. you can do 50 pushups at once, so 50% would mean you should be doing 5 sets of 25 push-ups)
- Weighted Parallel Bar Dips: 3-5x5 (this movement is the cornerstone of this session. The pushups are a warm up for dips. Remember to work toward your goal of 5x5 good, controlled dips. By week 6-8 you should be doing this with 1/8 or more of your bodyweight).
- Divebombers: 5x10
- Shoulder Press: choices...
    - Dumbbell overhead press, 3-5x5, two arms (eg. one 25lbs DB in each hand)
    - Dumbbell overhead press, downward ladder with one arm at a time (eg. 7 reps left arm, 7 reps right arm, 6 reps left arm, 6 reps right arm, 5 reps... etc), begin with a weight that you can complete the entire sequence downward beginning at 7, then add weight as you get stronger over weeks
        - Be sure and stagger your feet for more support
        - Keep your posture straight and engage your core
        - You can do this with a kettlebell as well
    - Military press, 3-5x5, use a barbell (use a weight that challenges you but you can still finish the prescribed setsxreps. Work your way up over the months).
- Cooldown

3. Usainity (Sprint Day)

- Warm-up, skipping, light jogging (prepare your body to sprint - a couple burpees helps)
- Bounding (push off and "bound" with big leaps, easy not forceful) 3x50m
- Wind sprints, 5x100m
    - Bound/stride the first 25m and at that point explode out into a full-out sprint for the remaining 75m
- Cooldown

4. Darth Sidious (Explosive Legs & Abs)

- Warm-up
- Box Jumps, 5x5
    - In terms of height recommendations, if you've never done box jumps start small. Don't start on a box you cannot complete the session on. You'll end up with bloody shins.
    - Focus on performing this session at a height that will challenge you every set, but not leave you unable to finish. (eg. You can do about 5 reps of jumps on a 36" box or ledge before pooping out. I'd recommend you begin this training on a 24" box, then work your way up to doing it on a 36" box over the months).
- Bodyweight squats, 5x20
    - Slow and controlled
    - Feet shoulder width apart, bring your ass to your calves before returning upright
- Hanging Knee Raises, 3x5
    - Watch the video for pointers on proper form
- Plank Hold, 3x60 seconds
- Jump roping, 10 minutes (doesn't have to be continuous, just get in some solid jump rope work)
- Cool down stretch and walk for 10 minutes, shake out legs

5. (Weighted) Pulllll (Pulling Strength Focus)

- Warm-up
- Hanging Knee Raises, 5x5
    - Use this time to hang and elongate your spine, relax your shoulders
- Weighted Chin-ups, 5x5
- Plank Hold, 3x60 seconds
- Weighted Pull-ups, 5x5
- Weighted Iso-holds, 3x30-60 seconds
    - With neck just over bar, hold your body in a pull-up position
- Cooldown

6. Baloo

- Warm-up
- Push-ups, 5x50% your 1 set max
- Hanging Knee Raises, 5x5
- Divebombers, 5x10
- Push-ups, 5x50% your 1 set max
- Hanging Knee Raises, 5x5
- Cool down

7. Big Johnson

- Warm-up
- Plank hold, 3x60 seconds
- Pull ups, 5x5
- Explosive Box Jumps, 5x5
- Pull ups, 5x5
- Explosive Box Jumps, 5x5
- Cool down

8. Charlie Sheen

- Warm-up
- 100 Divebombers, take rest every 10-20 if needed
- Bodyweight Squats, 10x20 controlled, ass-to-calves
- 50 Divebombers
- Chin-ups, 5x5
- 25 Divebombers
- Bodyweight Squats, 3x10
- 10 Divebombers
- Cool down

9. Bro Namath

- Warm-up
- Hanging Leg Raises, 5x5
- Parallel Bar Dips, 5x5
- Chin-ups, 5x5
- Parallel Bar Dips, 5x5
- Chin-ups, 5x5
- Cool down

10. Anakin

- Warm-up
- Bodyweight Squats, 5x20
- Bounding, 3x25m
- Sprinting
    - 3x200m
    - Ease your way into an explosion at 100m-to-go (eg. progressively get faster during the first 100m then at the 100m line explode forward into an all-out sprint for the second 100)
- Pull-ups, 5x5
- Cool down

11. Sweetish Hill (Hill Sprinting)

- Warm-up
- Bounding, 3x25m
- Hill Sprints, 5x50-100m
    - Find a hill of moderate grade (ie. not so steep that your fingernails get dirty) that you can power up hard for 50-100m
    - Walk back down and recover just enough to do the next set hard again
    - Practice good form and posture
- Jump Roping, 5-10 minutes
- Walk 5-10 minutes

12. Coffee Stains (Burpees)

- Warm-up
- 50 bodyweight squats
- Burpees, 5x10
- Jump rope for a minute to loosen up
- Burpees, 4x10
- Jump rope for a minute to loosen up
- Burpees, 3x10
- Jump rope for a minute to loosen up
- Burpees, 2x10
- Jump rope for a minute to loosen up
- Burpees, 1x10
- Cool down

Note: This session does not necessarily need to be a HIIT session, though it can be if you want. However, if you aren't in the mood for vomiting then there's no need to push yourself super hard and rush back into each set. Depending on how much time you have, take a solid 90-120 seconds for recovery between bouts so you can go hard again every time.

13. K9

- Warm-up
- Bounding, 3x25m
- Windsprint, 3x25m
- Sprinting, 3x50m
- Finishers (Hard Sprinting), 2x100m
- Cool down, walking

14. McAdoo

- Warm-up
- Chin-ups, 3x5
- Pull-ups, 3x5
- Parallel Bar Dips, 3x5
- Pull-ups, 3x5
- Chin-ups, 3x5
- Cool down

Note: Remember to add weight if 5 reps is easy, though be sure and pace yourself on McAdoo because it's deceivingly difficult by the end.

15. Bombshell (Clean and Press)

- Warm-up
- Explosive Box jumps, 3x5
- Clean and Press (with barbell), 5x5
    - Use a weight that challenges you, but you can complete the full session with around 90-120 seconds rest between sets
    - See demo for form instructions
- Explosive Box jumps, 3x5
- Cool down

16. NO Explode (Explosive Pulling)

- Warm-up
- Weighted Pull-ups, 2x5
- Jump rope, 5 minutes to loosen up
- High pulls, (bodyweight) 5x5
- Explosive Pull-ups, 3x3-5
- Jump rope, 5 minutes to loosen up
- High pulls, 3x5
- Explosive Pull-ups, 2x5
- Cool down

17. The Terminator (Burpee + Sprinting Combo)

- Warm-up
- Bounding, 3x25m
- Sprint, 100m
    - Then drop directly into...
- Burpees x 10
    - Then rest for 2-4 minutes
- Repeat the sprinting/burpee combo x5
- Cool down

18. Smoking Gun (Pistol Progression)

- Warm-up
- 25 bodyweight squats
- Assisted pistols, 3x3 each leg
    - Hold you hand on a chair or a vertical bar nearby for assistance
- Chair-assisted pistols, 2x3 each leg
    - Put a chair beneath your butt, and do the pistol motion until your

butt touches the chair, then return to the upright position
- Low, one-legged box jumps, 3x3 each leg
    - Find a low box or ledge, stand on one foot, explode off that foot up onto the box
- Jump roping, 5 minutes, to loosen up
- Cool down

19. Straight 'n Full (Hanging Core)

- Warm-up
- Hanging Knee Raises, 5x10
- Dip-hold leg raises, 3x10
    - On parallel bars, hold yourself at the top of a dip motion, extend legs straight out in front of you so your body makes an L shape, return them back down for one rep.
- Hanging Leg Raises, 5x5
- Dip-hold leg raises, 3x5
- Hanging Leg Raises, 2x5
- Cool down

20. Moneymaker (Chest and Back)

- Warm-up
- Incline Bench Press, 3x5-7
    - Use a weight that is ~60-75% your 1RM
- Deadlift, 3x5
    - Warm up with two sets of light weight 10 reps, one set medium weight 5 reps
- (Weighted) Parallel Bar dips, 2x5
- Cool down

Weeks 1-8

GOAL: To build up to 5x5 in weighted pull-ups, chin-ups, and parallel bar dips by week 8 with 1/8-1/4 bodyweight on weight belt.

EXAMPLE WEEK:

- Monday: Weighted Old Faithful
- Tuesday: Rest
- Wednesday: Usainity
- Thursday: Rest
- Friday: Weighted Brotato
- Saturday: Weighted Pullllll
- Sunday: Rest

*Feel free to customize your schedule however you like, using the following 5 session templates.

USE THESE SESSIONS:

- Weighted Old Faithful
- Usainity
- Weighted Brotato
- Darth Sidious
- Weighted Pullllll

Weeks 9 - 16

GOAL: Continue with first goal of 5x5 in pull-ups, chins, and dips, and now make steady progress into weighted variations of these three movements in the 5 rep range by adding 2.5-5lbs to them every 1-2 weeks.

EXAMPLE WEEK:

- Monday: (Weighted) Pullllll
- Tuesday: Rest
- Wednesday: NO Explode
- Thursday: Rest
- Friday: The Terminator
- Saturday and Sunday: Rest

*Feel free to continue working the sessions from weeks 1-8 into this period of time as you please, especially if you particularly enjoy one or two of them. Add weight to the pull-ups, chins, and dips if you can.

When adding weight, use your weight belt and add plates in increments of 2.5-5 lbs every week or two, depending on how quickly you progress.

USE THESE SESSIONS (along with the first 5, and weighted variations):

- NO Explode
- The Terminator
- Sweetish Hill
- Baloo
- Big Johnson
- Bro Namath

- Coffee Stains
- K9
- McAdoo

Weeks 17-24

GOAL: To do first pistol squat. To consistently perform Old Faithful and/or Pullllll with weighted movements adding over 1/4 bodyweight to the belt. Enough proficiency in plyometric pull-ups to begin shifting focus to muscle-ups by week 24.

EXAMPLE WEEK:

- Monday: (Weighted) Pullllll
- Tuesday: Smoking Gun
- Wednesday: Rest
- Thursday: Straight 'n Full
- Friday: NO Explode
- Saturday: Rest
- Sunday: Rest

*Feel free to continue working the sessions from weeks 1-16 into this period of time as you please, especially if you particularly enjoy one or two of them. Add weight to the pull-ups, chins, and dips if you can.

USE THESE SESSIONS (along with the other choices, and weighted variations):

- Straight 'n Full
- Smoking Gun
- Bombshell
- Moneymaker

Advanced

The Movements:

Here are video + photo demonstrations of all the movements in the intermediate program. Use this as a reference if you don't understand the movement based on its name:

Pull-up: No kipping! It's pointless. Focus on form and even contraction: http://www.youtube.com/watch?v=utjNyrxIgA4 < Al gives some very good recommendations for helping work your way to pull-ups as well. This video is filmed in my old training grounds in NYC, Tompkins Square Park.

Chin-up: Al also demonstrates the chin up in the same video as above.

Parallel Bar Dips: http://www.youtube.com/watch?v=HcntlwvyTKU

Push-ups: http://www.youtube.com/watch?v=FxBj8kmj-ZI

Box Jumps: http://www.youtube.com/watch?v=hxldG9FX4j4

Divebomber: For an enjoyable video to watch (and pause) use this tutorial: http://www.youtube.com/watch?v=66-v0AaANHk

For a utilitarian tutorial that you'll only want to watch once, check out this one: http://www.youtube.com/watch?v=ttk8RdiIHzA

Jump Roping: http://www.youtube.com/watch?v=0Gu3WrJopB4

Bodyweight Squats: http://www.youtube.com/watch?v=p3g4wAsu0R4

Hanging Knee Raises: http://www.youtube.com/watch?v=PGSKkNB1Oyk

Hanging Leg Raises: http://www.youtube.com/watch?v=hdng3Nm1x_E

Dip Bar Knee Raises: http://www.youtube.com/watch?v=nv5r7k5KPHc

Plank Hold: http://www.youtube.com/watch?v=pSHjTRCQxIw

Hanging Leg Raises: http://www.youtube.com/watch?v=ZG66zhtQ8b8

Pistol Squats: http://www.youtube.com/watch?v=XcHuJ1UBiCA

High Pull-ups: http://www.youtube.com/watch?v=Mc2rvfxBILk

Explosive Pull-ups: http://www.youtube.com/watch?v=hhpRf9pVlLQ

Burpees: http://www.youtube.com/watch?v=_43ezrGPwIg

Clean and Press: http://www.youtube.com/watch?v=UqZGpLeWanI

Incline Bench Press (can use bar or dumbbells): http://www.youtube.com/watch?v=wsCi4OnQ-xs

Deadlift: http://www.youtube.com/watch?v=iid8r-CVK-o

Front Lever Raises: http://www.youtube.com/watch?v=HZ8JfDtYBNk

Korean Dips: http://www.youtube.com/watch?v=42-lPrG7dkU

Weighted Muscle-ups: two variations

- With weight belt: http://www.youtube.com/watch?v=oNgWuvqhIdQ
- With weight between feet: http://www.youtube.com/watch?v=YuPT6QlQSVY

Reverse Box Jumps: http://www.youtube.com/watch?v=lE_z2wvC4oI

- Start on top of the box, drop down and spend as little time on the ground as possible, rebounding straight back up

ADVANCED SESSIONS:

(The first 20 are from the other programs. Use them for variety, and especially use Old Faithful, and Pullllll often as benchmark sessions if you're building your weighted pulling power and chest strength. Sessions beyond #20 are the highly-specialized sessions for advanced trainees only).

1. (Weighted) Old Faithful:

- Warm-up
- Weighted Chin-ups: 5 sets of 5 reps (5x5)
- Weighted Parallel bar dips: 5x5
- Weighted Pull-ups: 5x5
- Divebombers: 5x10
- Cooldown

Notes: Assuming you're beginning this program with the ability to do 5x5 in pull-ups, chins, and parallel bar dips, then you'll be doing this session weighted. Begin with a weight (use a weight belt) that challenges you but still allows you to

finish the session. Add 2.5-5 lbs of weight to the belt every week to two weeks. Old Faithful is what I refer to as a benchmark training session, the session you should always go back to every week or two to measure your progress and work on the most important movements.

2. (Weighted) Brotato (Chest & Shoulder Focus)

- Warm-up
- Push-ups: 5 sets of 50% your max (eg. you can do 50 pushups at once, so 50% would mean you should be doing 5 sets of 25 push-ups)
- Weighted Parallel Bar Dips: 3-5x5 (this movement is the cornerstone of this session. The pushups are a warm up for dips. Remember to work toward your goal of 5x5 good, controlled dips. By week 6-8 you should be doing this with 1/8 or more of your bodyweight).
- Divebombers: 5x10
- Shoulder Press: choices...
    - Dumbbell overhead press, 3-5x5, two arms (eg. one 25lbs DB in each hand)
    - Dumbbell overhead press, downward ladder with one arm at a time (eg. 7 reps left arm, 7 reps right arm, 6 reps left arm, 6 reps right arm, 5 reps... etc), begin with a weight that you can complete the entire sequence downward beginning at 7, then add weight as you get stronger over weeks
        - Be sure and stagger your feet for more support
        - Keep your posture straight and engage your core
        - You can do this with a kettlebell as well
    - Military press, 3-5x5, use a barbell (use a weight that challenges you but you can still finish the prescribed setsxreps. Work your way up over the months).
- Cooldown

3. Usainity (Sprint Day)

- Warm-up, skipping, light jogging (prepare your body to sprint - a couple burpees helps)

- Bounding (push off and "bound" with big leaps, easy not forceful) 3x50m
- Wind sprints, 5x100m
    - Bound/stride the first 25m and at that point explode out into a full-out sprint for the remaining 75m
- Cooldown

4. Darth Sidious (Explosive Legs & Abs)

- Warm-up
- Box Jumps, 5x5
    - In terms of height recommendations, if you've never done box jumps start small. Don't start on a box you cannot complete the session on. You'll end up with bloody shins.
    - Focus on performing this session at a height that will challenge you every set, but not leave you unable to finish. (eg. You can do about 5 reps of jumps on a 36" box or ledge before pooping out. I'd recommend you begin this training on a 24" box, then work your way up to doing it on a 36" box over the months).
- Bodyweight squats, 5x20
    - Slow and controlled
    - Feet shoulder width apart, bring your ass to your calves before returning upright
- Hanging Knee Raises, 3x5
    - Watch the video for pointers on proper form
- Plank Hold, 3x60 seconds
- Jump roping, 10 minutes (doesn't have to be continuous, just get in some solid jump rope work)
- Cool down stretch and walk for 10 minutes, shake out legs

5. (Weighted) Pullllll (Pulling Strength Focus)

- Warm-up

- Hanging Knee Raises, 5x5
    - Use this time to hang and elongate your spine, relax your shoulders
- Weighted Chin-ups, 5x5
- Plank Hold, 3x60 seconds
- Weighted Pull-ups, 5x5
- Weighted Iso-holds, 3x30-60 seconds
    - With neck just over bar, hold your body in a pull-up position
- Cooldown

6. Baloo

- Warm-up
- Push-ups, 5x50% your 1 set max
- Hanging Knee Raises, 5x5
- Divebombers, 5x10
- Push-ups, 5x50% your 1 set max
- Hanging Knee Raises, 5x5
- Cool down

7. Big Johnson

- Warm-up
- Plank hold, 3x60 seconds
- Pull ups, 5x5
- Explosive Box Jumps, 5x5
- Pull ups, 5x5
- Explosive Box Jumps, 5x5
- Cool down

8. Charlie Sheen

- Warm-up

- 100 Divebombers, take rest every 10-20 if needed
- Bodyweight Squats, 10x20 controlled, ass-to-calves
- 50 Divebombers
- Chin-ups, 5x5
- 25 Divebombers
- Bodyweight Squats, 3x10
- 10 Divebombers
- Cool down
-

9. Bro Namath

- Warm-up
- Hanging Leg Raises, 5x5
- Parallel Bar Dips, 5x5
- Chin-ups, 5x5
- Parallel Bar Dips, 5x5
- Chin-ups, 5x5
- Cool down

10. Anakin

- Warm-up
- Bodyweight Squats, 5x20
- Bounding, 3x25m
- Sprinting
    - 3x200m
    - Ease your way into an explosion at 100m-to-go (eg. progressively get faster during the first 100m then at the 100m line explode forward into an all-out sprint for the second 100)
- Pull-ups, 5x5
- Cool down

11. Sweetish Hill (Hill Sprinting)

- Warm-up
- Bounding, 3x25m
- Hill Sprints, 5x50-100m
    - Find a hill of moderate grade (ie. not so steep that your fingernails get dirty) that you can power up hard for 50-100m
    - Walk back down and recover just enough to do the next set hard again
    - Practice good form and posture
- Jump Roping, 5-10 minutes
- Walk 5-10 minutes

12. Coffee Stains (Burpees)

- Warm-up
- 50 bodyweight squats
- Burpees, 5x10
- Jump rope for a minute to loosen up
- Burpees, 4x10
- Jump rope for a minute to loosen up
- Burpees, 3x10
- Jump rope for a minute to loosen up
- Burpees, 2x10
- Jump rope for a minute to loosen up
- Burpees, 1x10
- Cool down

Note: This session does not necessarily need to be a HIIT session, though it can be if you want. However, if you aren't in the mood for vomiting then there's no need to push yourself super hard and rush back into each set. Depending on how much time you have, take a solid 90-120 seconds for recovery between bouts so you can go hard again every time.

13. K9

- Warm-up
- Bounding, 3x25m
- Windsprint, 3x25m
- Sprinting, 3x50m
- Finishers (Hard Sprinting), 2x100m
- Cool down, walking

14. McAdoo

- Warm-up
- Chin-ups, 3x5
- Pull-ups, 3x5
- Parallel Bar Dips, 3x5
- Pull-ups, 3x5
- Chin-ups, 3x5
- Cool down

Note: Remember to add weight if 5 reps is easy, though be sure and pace yourself on McAdoo because it's deceivingly difficult by the end.

15. Bombshell (Clean and Press)

- Warm-up
- Explosive Box jumps, 3x5
- Clean and Press (with barbell), 5x5
    - Use a weight that challenges you, but you can complete the full session with around 90-120 seconds rest between sets
    - See demo for form instructions
- Explosive Box jumps, 3x5
- Cool down

16. NO Explode (Explosive Pulling)

- Warm-up
- Weighted Pull-ups, 2x5
- Jump rope, 5 minutes to loosen up
- High pulls, (bodyweight) 5x5
- Explosive Pull-ups, 3x3-5
- Jump rope, 5 minutes to loosen up
- High pulls, 3x5
- Explosive Pull-ups, 2x5
- Cool down

17. The Terminator (Burpee + Sprinting Combo)

- Warm-up
- Bounding, 3x25m
- Sprint, 100m
    - Then drop directly into...
- Burpees x 10
    - Then rest for 2-4 minutes
- Repeat the sprinting/burpee combo x5
- Cool down

18. Smoking Gun (Pistol Progression)

- Warm-up
- 25 bodyweight squats
- Assisted pistols, 3x3 each leg
    - Hold you hand on a chair or a vertical bar nearby for assistance
- Chair-assisted pistols, 2x3 each leg
    - Put a chair beneath your butt, and do the pistol motion until your butt touches the chair, then return to the upright position
- Low, one-legged box jumps, 3x3 each leg
    - Find a low box or ledge, stand on one foot, explode off that foot up onto the box

- Jump roping, 5 minutes, to loosen up
- Cool down

19. Straight 'n Full (Hanging Core)

- Warm-up
- Hanging Knee Raises, 5x10
- Dip-hold leg raises, 3x10
    - On parallel bars, hold yourself at the top of a dip motion, extend legs straight out in front of you so your body makes an L shape, return them back down for one rep.
- Hanging Leg Raises, 5x5
- Dip-hold leg raises, 3x5
- Hanging Leg Raises, 2x5
- Cool down

20. Moneymaker (Chest and Back)

- Warm-up
- Incline Bench Press, 3x5-7
    - Use a weight that is ~60-75% your 1RM
- Deadlift, 3x5
    - Warm up with two sets of light weight 10 reps, one set medium weight 5 reps
- (Weighted) Parallel Bar dips, 2x5
- Cool down

21. Kim Jong Un

- Warm-up
- Korean Dips, 5x5
- Muscle-ups, 5x5

- Korean Dips, 5x5
- Muscle-ups, 3x5
- Sprints, 3x100m
- Cool down

22. Dennis Rodman

- Warm-up
- Reverse Box Jumps, weighted 3x5
    - Begin with holding 10lb dumbbells in your hands, work your way up in weight as you get stronger
- Pistol squats, 3x5 each leg
- Reverse Box Jumps, unweighted 3x10
    - height of box needs to be challenging enough to almost not finish this last set
- Burpee-to-muscle-up, 3x3-5
- Cool down

23. McLovin'

- Warm-up
- Weighted Chins, 3x5
- Korean Dips, 5x5
- Weighted Pull-ups, 3x5
- Korean Dips, 5x5
- Muscle-ups, 3x5
- Cool down

24. Abz

- Warm-up
- Hang from bar for 60 seconds to elongate spine and relax muscles
- Front lever raises, 5x5
- Dip-to-leg raise V, 3x10
    - On parallel bars, do a full dip then at the top of the motion hold

yourself and raise your legs out in front of your to form an L with your body, then open your legs into a V shape, close, lower, dip again...

- Hanging Leg Raises, 3x5-10
    - Touch feet to the bar, keeping body as straight as possible
- Korean Dips Isos, 3x60 seconds
    - Go into a Korean dip but hold instead of going up and down
- Cool down stretching

25. Anawanna (Very heavy dipping)

- Warm-up
- Front dips, 3x5
    - This is just the top half of a muscle-up, on a flat bar
    - This is to warm up a bit before the next set
- Heavy Dips, 5x3
    - Parallel bar dips
    - Use a weight that you could do 4 reps with, push yourself
- Bodyweight dips flush set, 1x max
- Bodyweight Pull-ups, 3x10 slow and controlled, focus on symmetry and contraction
- Cool down

26. MU Madness (Muscle-up training)

- Warm-up
- High Pulls, 3x5
- Explosive Pull-ups, 3x5
- Clap Pull-ups, 3x5
- Muscle-ups, 5x5
- Cool down

Weeks 1-8

GOAL: To build muscle-up strength & power (To do first muscle-up, if you cannot do one yet). If you cannot do a muscle-up, read this article (http://www.kinobody.com/2323/muscle-up-tutorial/) and watch this video (http://www.youtube.com/watch?v=O0JdwK9gjUI)

EXAMPLE WEEK:

- Monday: Old Faithful, work your way up to 1/2+ bodyweight on the weight belt
- Tuesday: Rest
- Wednesday: NO Explode (Begin workout with muscle-up attempts)
- Thursday: Rest
- Friday: Kim Jong Un (If you can do MUs), replace MUs with high pulls if you cannot yet
- Saturday & Sunday: Rest

USE THESE SESSIONS:

- Any sessions from the beginner and intermediate plans, just add weight to add intensity and keep yourself in the 5 rep range
- Kim Jong Un
- McLovin'
- Abz
- Anawanna

Weeks 9-16:

GOAL: Continue building MU strength and overall weighted movement power. **Do 4 sessions per week**, one of them being a sprint-based session and one being an abdominal session.

EXAMPLE WEEK:

- Monday: Abz
- Tuesday: Rest
- Wednesday: McLovin'
- Thursday: Rest
- Friday: MU Madness
- Saturday: Rest
- Sunday: Sweetish Hill

USE THESE SESSIONS:

- Any sessions from the beginner and intermediate plans, just add weight to add intensity and keep yourself in the 5 rep range
- Kim Jong Un
- McLovin'
- Abz
- Anawanna
- MU Madness

Weeks 17-24

GOAL: To do first weighted muscle-up. Continue building your pulling and dipping power, and perfecting your straight muscle-up form, even slowing them down to use no momentum. When you can do slow, perfect-form muscle-ups you can add weight.

EXAMPLE WEEK:

- Monday: Old Faithful

- Tuesday: Rest
- Wednesday: Anawanna
- Thursday: Rest
- Friday: MU Madness
- Saturday: Rest
- Sunday: Dennis Rodman

USE ANY AND ALL SESSIONS TO CUSTOMIZE YOUR TRAINING

Nutrition

Information:

In this section of the program I will lay out all of the information you need to know in terms of planning your nutrition correctly.

Remember the main takeaways from the nutrition segment of the book earlier:

- *Do not sacrifice carbohydrates and fats for the sake of eating additional protein*
- *Eat just enough protein to support your training goals and muscle mass, and do not eat beyond*
- *When recomping (changing your body composition) and/or losing body fat, do not use extreme deficit dieting, use a moderate to small deficit of 10-20% to keep your dieting from being a stressor on the system*
- *Get your fats from saturated fats and monounsaturated fats, mainly, preferably from animal products*
- *Get your protein from animal proteins*
- *Eat a nutrient-rich diet to get the necessary micronutrients, vitamins, and minerals (a baseline amount of zinc, b-vitamins, and magnesium are necessary, and can be acquired via diet. Beyond that you do not need additional supplementation if you have normal levels).*

How to know what macro split to eat at:

Remember, figure out your minimum protein requirements to support your training, and do not eat beyond that. Fill in the rest of the diet with carbohydrates and fats from the right sources.

How much protein should you consume? Well, you can have high testosterone and look average. This program is not so much a physique training program as it is an endocrine enhancement program. Remember, if you have high testosterone, you'll have an easier time supporting muscle mass and making additional gains later.

The approach I take is to worry about training and eating correctly and the

physique typically ends up looking aesthetic anyways. This takes away additional needless worrying about "am I getting enough protein" or "is my muscle going to waste away." Much of that worrying is inspired by bullshit supplement propaganda anyways, so see it for what it is.

If you are training on this program you will need around **0.5-1g of protein per pound bodyweight**, and this will vary between individuals.

I encourage you to self-experiment and see what level you feel best at. Take a period of 2-4 weeks and eat at a certain level, for example 1g per pound, and see how you feel and how your body responds. Then switch it up by cutting to 0.5g per pound and do that for a month - see how you feel then. The additional carbs and fats may help you sleep better or have more energy during the day, and you may find that your training is just fine and your physique hasn't been negatively affected.

Most "fitness gurus" will scoff at this and probably give me shit for recommending such an approach. Oh well, I don't care. I think this is the correct way to go about things.

Find that absolute minimum amount of protein you need and get the rest of your nutrition from nutrient-rich fats and carbohydrates. The higher the percentage of fats and carbohydrates in your diet, while protein is supported moderately, the better your T production will be, according to the research.

How to calculate calories:

This is not a fat loss program or a physique training program, however, I do think you need to do this correctly, though it is not rocket science.

Use an online calculator such as this one (http://iifym.com/iifym-calculator/) to find your estimated total daily energy expenditure and get your numbers. You can also enter a custom protein grams per pound into the calculator (eg. enter 0.5g).

The calculator does all the work for you. Just write down the numbers and use

those as a reference.

How the sample menus are laid out:

This section includes four sample weekly menus for you to use as a reference.

The menus include sample meals, usually very simple ones (simplicity is genius, and gets results). You do not, by any means, need to strictly adhere to these - in fact, I suggest you do not.

Use them as a learning tool to get ideas for your own meals. I am by no means a masterful chef. I'm usually pretty boring in my meal preparation, but hey it's effective when it comes to tangible results.
Rule of thumb: have an animal protein, preferably rich in saturated fat, a fair amount of vegetables, an additional fat source from fruits such as avocados or olives, from coconut oil, or from animal products like cheese and butter, and a starchy carbohydrate of some kind at your meals.

With those combined, in the right quantities (especially if you're fasting and having 2-3 meals per day) you will not be wanting for additional food. The combination of the fats and carbohydrate with animal protein is incredibly filling and satiating.

As long as you keep your calories where they need to be to achieve your goal, you will not gain body fat. You will likely lose it, especially if you train according to the training progressions.

The sample menus do not contain quantities of food, just examples of the food item itself, and combinations thereof.

You determine the quantities.

They're set up in a balance that will sate your appetite and balance an overall plan based on T-sensitive nutrition principles. Each day has two meal suggestions.

Sample Week #1:

Monday:

Meal #1 - Single Pan Stir Fry

White Rice
Frozen Mixed Veggies
Rotisserie Chicken
Sea Salt
Coconut Oil

Instructions: Bachelor heaven. This bad boy only takes about 10 minutes total from start to finish to cook. Using a large skillet, bring some water to a boil. Add frozen vegetables to hot water and cover for a minute or two. Add instant white rice to boiling water and stir. Saturate the rice in the water. Cover for a minute or two. Boil off all additional excess water until rice is at consistency you prefer. Take off heat source, and add strips of rotisserie chicken to the rice/veggies, stir in. Serve in a bowl and pour some melted coconut oil on top and season with sea salt. Tastes incredible, and super filling. Great meal for training days.

Meal #2 - The Triple Stack

3 ground beef patties
3 slices of Cabot aged cheddar
Coconut oil or butter

Instructions: This is a ritual staple of my training partner and I. I've not yet found a better way to get ~1300-1500 calories of incredible-ness into one meal. You will likely not be hungry for many hours after eating The Triple Stack. Melt some butter or coconut oil in a pan, cook the three beef patties to your liking, melt the cheese a little right at the end of the cooking. Stack the cheese between the patties, season with some sea salt, and be prepared to mouthgasm.

Tip: For carbohydrate, and if you're trying to get the calorie content of this meal up to 2000, add a sweet potato on the side and dress The Triple Stack with some tangy BBQ sauce. It's incredible. You can also split this into two meals if you'd like.

Tuesday:

Meal #1 - The Sloppy Leprechaun

Potatoes
Ground beef
Tomato sauce
Sea salt (to taste)

Instructions: Chop and cook the potatoes in a crock pot until soft. When ready, cook the ground beef in a skillet, season with some sea salt, and stir in the tomato sauce. Put some soft potatoes into a bowl and add the sloppy beef on top, smush it all together, and enjoy.

Meal #2 - Spartan Chicken

Chicken Breasts
Chicken seasoning
Cream of mushroom soup
Black olives
Mixed vegetables (side)

Instructions: Put the chicken breasts in an oven pan and smother them in chicken seasoning and cream of mushroom soup (to your tastes in terms of amounts). Bake in the oven. Take out and garnish with black olives and serve with a side of mixed vegetables.

Wednesday:

Meal #1 - Sweet Potato Hash

Sweet potatoes
Onions
Green peppers
Rotisserie chicken
Curry seasoning (optional)

Instructions: Dice the sweet potatoes into cubes, boil in water until soft. In another skillet, saute the peppers and onions in olive oil or butter. When ready, pile the soft diced sweet potatoes into a mountain on your plate and put the sauteed peppers and onions on top. Now pile a bunch of chicken (with the skin) on top of that and season with whatever spice you want.

Meal #2 - Steak and Eggs

Steak
Eggs

Instructions: Cook steak. Cook eggs. Put on same plate. Eat.

Thursday:

Meal #1 - Wilbur's Nightmare

Pork tenderloin
Bacon
Butter

Instructions: Wrap the tenderloin in bacon and place in a baking pan. Cook it in the oven until ready. When done, take out and slice up into servings sizes (about palm of hand). Add some butter to each piece and serve with a baked potato or two.

Meal #2 - Crispy Shepherd's Pie

Russet potatoes
Olive oil (or coconut oil)
Sea Salt
Ground beef
Cheese

Instructions: Slice the potatoes in wedges and sprinkle with oil. Bake on oven sheet until crispy brown. Take out and apply sea salt. Cook ground beef in a skillet until ready. Layer the crispy potatoes on a plate, then put the ground beef on top. Now melt some slices of cheese over your pile of food. Enjoy.

Friday:

Meal #1 - Django's Omelet

Eggs
Cheese
Bacon
Avocado
Onions
Salsa

Instructions: Make an egg omelet (use the whole thing, none of this egg white BS) with all of the ingredients on the list. Dress with some fresh salsa.

Meal #2 - Hawaiian Pulled Pork

Pork shoulder
Pineapple
BBQ Sauce

Instructions: Cook the pork in a slow cooker until it is tender and looks like pulled pork. Dice the pineapples and stir together with BBQ sauce. Smother the

pork in the Pineapple/BBQ sauce. Enjoy.

Saturday:

Meal #1 - Beef Stew

Beef tips
Beef stock
Carrots
Onions
Peppers

Instructions: Chop veggies, add stock and beef tips all into crock pot. Cook until ready. Eat.

Meal #2 - Steak Fajitas

Skirt steak strips
Onions
Peppers
Avocado
Cheese
Potatoes

Instructions: Slice potatoes into wedges and sprinkle with melted coconut oil and salt. Bake until crispy brown. Saute steak, onions, peppers in a skillet. Slice fresh avocado and grate cheese. Eat steak and veggies with crispy potatoes on the side. Put avocado slices and cheese on top. Add salsa.

Sunday:

Meal #1 - Bland Land

Turkey breast
Potato

Chives
Sour cream

Instructions: Bake potato in oven or microwave. Bake turkey breast in oven. Eat baked potato with fresh chives and sour cream as a side to the turkey breast.

Meal #2 - Beef Teriyaki

White rice
Beef strips
Mixed veggies
Teriyaki sauce

Instructions: Using a skillet, boil water with frozen mixed veggies in it. Add instant white rice and cook until ready. In another skillet, cook the steak strips. Mix it all together in a bowl and add teriyaki sauce.

Sample Week #2:

Monday:

Meal #1 - All American Breakfast

Eggs
Shredded Cheese
Bacon
Potatoes

Instructions: Scramble the eggs and add the shredded cheese. Cook the bacon. Dice the potatoes and boil them until soft then spice them with some sea salt and pepper.

Meal #2 - Mama Walker's Go-to

Sweet Potatoes
Rotisserie Chicken
Butter

Instructions: Cook the sweet potato in the oven or microwave. Eat with butter on top and as a side to the chicken.

Tuesday:

Meal #1 - The Bird's Nest

Potatoes
Greek yogurt
Rotisserie Chicken
Eggs

Instructions: Bake or boil the potatoes, mash them up with some Greek yogurt and salt and pepper. Cook the eggs over-easy. Make a pile of potatoes on the plate, put the eggs on top of the pile, then put some pieces of chicken on top. Viola, a bird's nest.

Meal #2 - Spanish Beef

Ground beef
Shredded cheese
Avocado
Salsa
White rice

Instructions: In a skillet, cook the beef. Serve over rice with salsa and fresh avocado.

Wednesday:

Meal #1 - Crock Pot Cheesy potatoes

Potatoes
Cheese
Ground beef

Instructions: Chop potatoes and cook in water in a crock pot. Cook beef in a skillet. When ready, melt cheese over potatoes and serve with beef.

Meal #2 - Turf 'n turf

Bacon

Steak

Instructions: Cook bacon. Cook steak in same skillet, keep bacon grease in skillet. Enjoy.

Thursday:

Meal #1 - Tropical Steak

Cheap tequila
Lime juice
Steak
Coconut oil

Instructions: Soak the steak overnight in the tequila and lime juice. Cook in coconut oil. It tastes really interesting.

Meal #2 - Sweet potato mash

Sweet potatoes
Butter
Rotisserie Chicken

Instructions: Cook, then mash the sweet potatoes with some butter. Add salt to taste. Serve with chicken (or any meat).

Friday:

Meal #1 - The Man Meal

Steak
Potatoes
Butter

Instructions: Grill steak. Bake potato. Add butter to both.

Meal #2 - The White Knight

Turkey
White Rice

Instructions: Eat them together.

Saturday:

Meal #1 - Sweet Rice Chicken

White Rice
Stevia
Cinnamon
Coconut Oil
Rotisserie Chicken

Instructions: Cook the rice, and add stevia and cinnamon and drizzle with melted coconut oil, stir. Combine in a bowl with rotisserie chicken meat.

Meal #2 - Happy Hour

Olives
Cheese cubes

Steak
Brazil Nuts

Instructions: cube the steak and braise it after marinating. Serve it all on trays with a couple drinks.

Sunday:

Meal #1 - Simply Shredded

Eggs
Chicken
Broccoli
Beef

Instructions: Chop up meats and grill to perfection. Cook the eggs sunny side up and steak the broccoli - season them with sea salt. Serve altogether for a "classic" training meal.

Meal #2 - Spicy pulled pork

Pork shoulder
Chipotle BBQ sauce
Jalapeno peppers

Instructions: Slow cook the pork shoulder in a crock pot until it falls apart tenderly. Chop peppers and stir into BBQ sauce. Slop the sauce on the pork when ready. Enjoy with sweet potato wedges (slice sweet potatoes and crisp in the oven).

Sample Week #3:

Carb-cycling.

Carb-cycling is a very effective way to still get a balanced overall intake of protein, carbohydrate, and fat (possibly even a higher amount of protein with minimal negative effect) while maintaining a high level of training and dropping body fat.

It is especially effective if you're fat adapted and have been eating low carb for the past 6-18 months and are stalling in your progress.

Quite simply, an effective carb cycling strategy is to split your week into two types of days:

1. Training days
2. Rest days

And eat a certain way on each day.

On training days, get almost all of your calories from protein and carbohydrate, with trace amounts of fat (I've found that it works best with under 50g with my clients).

On rest days, get the bulk of your intake from protein and fat, preferably animal sources, and get your carbs from green vegetables only.

It's very simple, and for people who can handle the low carb day well, very effective at recomping while training hard.

If you just stick to this general principle, you can pretty much eat the foods you want. Below I've organized a sample week's worth of simple recipes using the recipes above in this manner to give you some templates to work from and a general idea of how it works. It's pretty straightforward.

Monday: (Training Day)

Meal #1 - Single Pan Stir Fry

White Rice
Frozen Mixed Veggies
Rotisserie Chicken
Sea Salt
Coconut Oil

Instructions: Bachelor heaven. This bad boy only takes about 10 minutes total from start to finish to cook. Using a large skillet, bring some water to a boil. Add frozen vegetables to hot water and cover for a minute or two. Add instant white rice to boiling water and stir. Saturate the rice in the water. Cover for a minute or two. Boil off all additional excess water until rice is at consistency you prefer. Take off heat source, and add strips of rotisserie chicken (without the skin) to the rice/veggies, stir in. Serve in a bowl and pour some melted coconut oil on top and season with sea salt. Tastes incredible, and super filling. Great meal for training days.

Meal #2 - Eggs 'n potatoes

Potatoes
Eggs
BBQ Sauce
Sea Salt

Instructions: Cook the eggs how you please. Bake the potatoes in the oven and season with sea salt. Eat with BBQ sauce on the side.

Tuesday: (Rest Day)

Meal #1 - The Triple Stack

3 ground beef patties
3 slices of Cabot aged cheddar

Coconut oil or butter

Instructions: This is a ritual staple of my training partner and I. I've not yet found a better way to get ~1300-1500 calories of incredible-ness into one meal. You will likely not be hungry for many hours after eating The Triple Stack. Melt some butter or coconut oil in a pan, cook the three beef patties to your liking, melt the cheese a little right at the end of the cooking. Stack the cheese between the patties, season with some sea salt, and be prepared to mouthgasm.

Meal #2 - Turf 'n turf

Bacon
Steak

Instructions: Cook bacon. Cook steak in same skillet, keep bacon grease in skillet. Enjoy.

Wednesday: (Training Day)

Meal #1 - Sweet Rice Chicken

White Rice
Stevia
Cinnamon
Coconut Oil
Rotisserie Chicken

Instructions: Cook the rice, and add stevia and cinnamon and drizzle with melted coconut oil, stir. Combine in a bowl with rotisserie chicken meat.

Meal #2 - The White Knight

Turkey
White Rice

Instructions: Eat them together.

Thursday: (Rest Day)

Meal #1 - Tropical Steak

Cheap tequila
Lime juice
Steak
Coconut oil

Instructions: Soak the steak overnight in the tequila and lime juice. Cook in coconut oil. It tastes really interesting.

Meal #2 - Happy Hour

Olives
Cheese cubes
Steak
Brazil Nuts

Instructions: cube the steak and braise it after marinating. Serve it all on trays with a couple drinks.

Friday: (Training Day)

Meal #1 - Spartan Chicken

Chicken Breasts
Chicken seasoning
Cream of mushroom soup
Black olives
Mixed vegetables (side)

Instructions: Put the chicken breasts in an oven pan and smother them in chicken

seasoning and cream of mushroom soup (to your tastes in terms of amounts). Bake in the oven. Take out and garnish with black olives and serve with a side of mixed vegetables.

Meal #2 - Sweet Potato Hash

Sweet potatoes
Onions
Green peppers
Rotisserie chicken
Seasoning (optional)

Instructions: Dice the sweet potatoes into cubes, boil in water until soft. In another skillet, saute the peppers and onions in water (steam). When ready, pile the soft diced sweet potatoes into a mountain on your plate and put the sauteed peppers and onions on top. Now pile a bunch of chicken (without the skin) on top of that and season with whatever spice you want.

Saturday: (Rest Day)

Meal #1 - Steak Fajitas

Skirt steak strips
Onions
Peppers
Avocado
Cheese

Instructions: Slice potatoes into wedges and sprinkle with melted coconut oil and salt. Bake until crispy brown. Saute steak, onions, peppers in a skillet. Slice fresh avocado and grate cheese. Eat steak and veggies. Put avocado slices and cheese on top. Add salsa.

Meal #2 - Beef Stew

Beef tips
Beef stock
Carrots
Onions
Peppers

Instructions: Chop veggies, add stock and beef tips all into crock pot. Cook until ready. Eat.

Sunday: (Rest Day)

Meal #1 - Plain Old Steak

One big NY Strip

Instructions: On the grill. Rub salt and pepper in before grilling.

Meal #2 - Django's Omelet

Eggs
Cheese
Bacon
Avocado
Onions
Salsa

Instructions: Make an egg omelet (use the whole thing, none of this egg white BS) with all of the ingredients on the list. Dress with some fresh salsa.

Sample Week #4:

Carbohydrates in the evening.

Many people who have trouble with carb cycling experience issues with not being able to fall asleep.

This can be easily remedied by consuming your carbohydrate-rich meal in the evening, which helps you relax as you wind down before bed.

As long as you stick to your calorie numbers, carbs in the evening won't make you fat. That's an old myth.

This is also quite simple, really you'll just want to consume meals consisting of mainly meats and veggies during the daytime hours, then for your evening meal, add a hearty starch source.

This works especially well if you train or go to the gym in the evening or late afternoon after work.

I've used the sample week below to reorganize some of the recipes in this manner so you can see how simple it can be to plan your week. Almost all clients who experience sleep issues are able to sleep soundly after adding the carb meal into the evening.

And for those of you who fear that it will hamper your growth hormone release cycle, Nate Miyaki explains why that shouldn't be a worry in this video.

Monday:

Meal #1 - The Triple Stack

3 ground beef patties
3 slices of Cabot aged cheddar
Coconut oil or butter

Instructions: This is a ritual staple of my training partner and I. I've not yet found a better way to get ~1300-1500 calories of incredible-ness into one meal. You will likely not be hungry for many hours after eating The Triple Stack. Melt some butter or coconut oil in a pan, cook the three beef patties to your liking, melt the cheese a little right at the end of the cooking. Stack the cheese between the patties, season with some sea salt, and be prepared to mouthgasm.

Meal #2 - Eggs 'n potatoes

Potatoes
Eggs
BBQ Sauce
Sea Salt

Instructions: Cook the eggs how you please. Bake the potatoes in the oven and season with sea salt. Eat with BBQ sauce on the side.

Tuesday:

Meal #1 - Django's Omelet

Eggs
Cheese
Bacon
Avocado
Onions
Salsa

Instructions: Make an egg omelet (use the whole thing, none of this egg white BS) with all of the ingredients on the list. Dress with some fresh salsa.

Meal #2 - The Sloppy Rooster

Potatoes
Chicken Breast
Tomato sauce
Sea salt (to taste)

Instructions: Chop and cook the potatoes in a crock pot until soft. When ready, cook the chicken breast in the oven, season with some sea salt, and stir in the tomato sauce. Put some soft potatoes into a bowl and add the chicken on top, smush it all together, and enjoy.

Wednesday:

Meal #1 - Turf 'n turf

Bacon
Steak

Instructions: Cook bacon. Cook steak in same skillet, keep bacon grease in skillet. Enjoy.

Meal #2 - The White Knight

Turkey
White Rice

Instructions: Eat them together.

Thursday:

Meal #1 - Tropical Steak

Cheap tequila
Lime juice
Steak
Coconut oil

Instructions: Soak the steak overnight in the tequila and lime juice. Cook in coconut oil. It tastes really interesting.

Meal #2 - Single Pan Stir Fry

White Rice
Frozen Mixed Veggies
Rotisserie Chicken
Sea Salt
Coconut Oil

Instructions: Bachelor heaven. This bad boy only takes about 10 minutes total from start to finish to cook. Using a large skillet, bring some water to a boil. Add frozen vegetables to hot water and cover for a minute or two. Add instant white rice to boiling water and stir. Saturate the rice in the water. Cover for a minute or two. Boil off all additional excess water until rice is at consistency you prefer. Take off heat source, and add strips of rotisserie chicken (without the skin) to the rice/veggies, stir in. Serve in a bowl and pour some melted coconut oil on top and season with sea salt. Tastes incredible, and super filling. Great meal for training days.

Friday:

Meal #1 - Spartan Chicken

Chicken Breasts
Chicken seasoning
Cream of mushroom soup
Black olives
Mixed vegetables (side)

Instructions: Put the chicken breasts in an oven pan and smother them in chicken seasoning and cream of mushroom soup (to your tastes in terms of amounts). Bake in the oven. Take out and garnish with black olives and serve with a side of mixed vegetables.

Meal #2 - Sweet Potato Hash

Sweet potatoes
Onions
Green peppers
Rotisserie chicken
Seasoning (optional)

Instructions: Dice the sweet potatoes into cubes, boil in water until soft. In another skillet, saute the peppers and onions in water (steam). When ready, pile the soft diced sweet potatoes into a mountain on your plate and put the sauteed peppers and onions on top. Now pile a bunch of chicken (without the skin) on top of that and season with whatever spice you want.

Saturday:

Meal #1 - Steak Fajitas

Skirt steak strips
Onions
Peppers

Avocado
Cheese

Instructions: Slice potatoes into wedges and sprinkle with melted coconut oil and salt. Bake until crispy brown. Saute steak, onions, peppers in a skillet. Slice fresh avocado and grate cheese. Eat steak and veggies. Put avocado slices and cheese on top. Add salsa.

Meal #2 - Sweet Rice Chicken

White Rice
Stevia
Cinnamon
Coconut Oil
Rotisserie Chicken

Instructions: Cook the rice, and add stevia and cinnamon and drizzle with melted coconut oil, stir. Combine in a bowl with rotisserie chicken meat.

Sunday:

Meal #1 - Plain Old Steak

One big NY Strip

Instructions: On the grill. Rub salt and pepper in before grilling.

Meal #2 - Beef Teriyaki

White rice
Beef strips
Mixed veggies
Teriyaki sauce

Instructions: Using a skillet, boil water with frozen mixed veggies in it. Add instant white rice and cook until ready. In another skillet, cook the steak strips. Mix it all together in a bowl and add teriyaki sauce.

References

You can find the full list of references by chapter at http://testosterone.io/references.

Thank you so much for ordering your copy of Testosterone I/O and reading it. I really hope this information helps you as much as it has helped me. It's completely changed my life for the better and I think it can do the same for you if you're struggling with similar issues.

Remember, give the steps some time. Implement changes into your life at a sustainable pace.

For further assistance on developing the proper mindset and tips on making progress, listen to the Road To Ripped podcast during your walks or in the car on the way to work.

You can find it on iTunes and on Stitcher.

Also, be sure and subscribe to my NoGym.net newsletter, if you haven't already.

I am building an entire blog around Testosterone I/O and a web series TV show so keep an eye on http://testosterone.io and send me any additional questions or episode ideas for topics that I didn't address in this program but you'd like to learn more about.

I am more than happy to continue teaching additional information on natural T enhancement via the new Testosterone I/O blog.

And as you make progress with this program please send me your updates to chris@testosterone.io - we may feature you on the Road To Ripped podcast and/or the Testosterone.io blog!

Much love,
Christopher Walker