
KEEP

Your Health...

IT

Your Body...

Your Energy...

UP

Your Strength...

THE POWER OF PRECISION MEDICINE TO
CONQUER **LOW T** AND REVITALIZE YOUR LIFE

FLORENCE COMITE, MD

Foreword by ABRAHAM MORGENTHAU, MD
associate clinical professor of urology, Harvard Medical School



RODAIE

THIS BOOK IS DEDICATED TO MY MOTHER AND FATHER.

My understanding of health began with my mother. Her garden-raised, fresh cooked, natural food meals—nary a can in sight—kept my twin sister, my brother, me, and our host of friends healthy, happy, and ... full. Vivid still, memories include her cold storage room, keeping garden vegetables fresh all year, and the years she pressed, with purple feet, garden grapes into wine.

My mother was also my earliest model of compassion. Daily, she carried fresh meals to elderly neighbors and received, in return, the pleasure that her food, conversation, and concern brought them. The rhythms of her daily life, ingrained in my memory, help me to give as a physician. To listen. To serve. To hug. Together, these acts of compassion, the “therapeutic alliance,” is quite possibly the most powerful healing tool a practitioner can offer.

My mother continues to garden at home in Pennsylvania, with my sister Harriet, the inheritor of the green thumb. Harriet is not only a master gardener, she is a busy dermatologist whose skilled hands have transformed lives.

From my father, we unconsciously absorbed the value of exercise. He took us outside as often as possible. He encouraged us in all sports, especially swimming. His three children were, no doubt, the only kids on the beach at Far Rockaway permitted to jump 20-foot, pre-storm waves. My brother Stephen absorbed our father’s lessons best of all. Stephen, who, like Harriet, is a successful dermatologist, shepherded his children over the years through a universe of sports and outdoor activity.

Prior to emigrating to the United States, my parents faced loss, devastation, and near death in a war-ravaged Europe. They overcame great odds to create a loving home, live productive lives, and teach their children that “winning” is never the goal. Rather, it’s about trying one’s very best. Accordingly, their children try their very best to achieve loving homes and productive lives, to transmit the values of their parents to the next generation, and, as physicians, to help in the healing of the world.

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FOREWORD

On my first day of medical school, the dean made a welcoming speech to the incoming students. “Study hard while you’re here,” he said, “but be aware that within 10 years of graduating half of what you’ve learned will turn out to be incorrect.”

How right he was! The shin bone may always be connected to the knee bone, but our knowledge, beliefs, and attitudes about health have changed beyond recognition from when my dean welcomed my fellow students and me 35 years ago. One key area that has changed is the critical role of hormones, especially testosterone in men, for maintaining our health.

My colleague Florence Comite, MD, is an endocrinologist who understands the importance of thinking forward and has made it part of her life’s work. It is not every day that one finds a kindred spirit trained in research-based medicine, yet with an interest in moving beyond the standard medical model of curing disease to helping men and women find their optimal health sweet spot. So, I am delighted to recommend *Keep It Up*, a marvelous guide to what men need to know about their bodies and their health in order to live long and to live well.

There are a great many health books out there, but this one is different. Medicine is changing, and what men are searching for is a guide that incorporates the latest insights with the best of established medical practice. This is such a book.

In these pages, Dr. Comite presents a forward-looking view on what it takes for men to live a healthy life, using what she has called *Precision Medicine* to get out ahead of disease and prevent it rather than waiting to treat it. Although the field of endocrinology (the part of medicine that deals with hormones) has a long and storied past, there is a new understanding of the nuances of hormones in men that is appreciated and advocated as yet by only a small vanguard of physicians. This change represents a true revolution in thought. I can attest to the critical importance of this approach from my own experience with the several thousand men who have walked through the doors of my own medical practice at Men’s Health Boston. These men have gained an acute sense of vitality and renewed health with testosterone therapy as they had never thought possible before. In *Keep It Up*, Dr. Comite provides an insider’s access to how an experienced, accomplished clinician thinks about some of the most common problems men face as they age, and what to do about them. And she offers a partnership with patients; that is the way good medicine should be practiced.

Many of the points and recommendations made in this book will be met with surprise and even scorn by the reader’s regular physician. That’s how it is when new information and beliefs meet old. My own experience bears this out.

As an undergraduate at Harvard University in the 1970s, I had performed research in lizards, finding that testosterone had critical functions on sexual behavior and acted as a brain hormone. During medical school and urology residency, I was taught almost nothing about testosterone. However, when I began my own urological practice in the late 1980s, I was curious about testosterone because of my prior research. I was surprised at how many of my patients had low testosterone levels. I was further surprised at how many reported feeling improved so quickly after I started them on testosterone therapy. Most had come to see me for sexual problems, yet when I saw them in follow-up I was impressed by how often they would say something like, “My erections are better and so is my sex drive, but the thing I like best is how good I feel overall.”

I soon began treating large numbers of men with testosterone, with excellent results. Many of my

patients who did well had been told by their regular physicians that there was nothing wrong with them. “You’re just getting older,” their doctors would tell them. It wasn’t true. These men had low T, as I called it. (I coined this term in the early 1990s to make it easier for discussions with patients and even some of my colleagues, who would feel uncomfortable when saying testosterone deficiency.) Their symptoms were real and caused by a hormone deficiency.

When I started doing this work, I didn’t know a single physician treating men routinely with testosterone for sexual symptoms such as erectile dysfunction or diminished libido, and my colleagues regarded my work as bizarre. Soon I discovered a small cadre of like-minded physicians around the United States with similar interests in researching the benefits of testosterone, but our work was almost unknown. At scientific meetings I would often make the only presentation involving testosterone. Today, those same meetings devote entire days to testosterone research. How times have changed. Eventually, people do catch on. However, there is still much resistance among the medical community to the idea that low T is a legitimate and common condition that merits treatment.

What’s important to know now is that testosterone is not all about sex, as is so often believed. As Dr. Comite discusses in detail, low T is also associated with symptoms of fatigue, depressed mood, reduced muscle mass and strength, and osteoporosis. Men with low T are at increased risk for developing diabetes, the metabolic syndrome (a set of conditions that predispose to cardiovascular risks, including obesity and high blood pressure), and atherosclerosis.

One of the great concerns about testosterone therapy has been the belief that higher testosterone levels cause an increased risk of prostate cancer. Fortunately, this turns out to be false. As I have reported in my research, the original concept was based on a single case in 1941, and numerous modern scientific studies have failed to show any connection between high testosterone levels and increased prostate cancer risk. In fact, in 2011 my colleagues and I published the first study of testosterone therapy in men with untreated low-grade prostate cancer, who were being monitored through active surveillance. Although the study was quite small, it was remarkable that not one of the men developed progression of their cancer after an average of 2½ years of testosterone treatment.

Today, men with prostate cancer regularly fly in to Boston from all over the world to ask me if they might be candidates for testosterone therapy. Offering testosterone therapy to these men was unthinkable a mere 10 years ago, when every medical student was taught that giving testosterone to a man with prostate cancer was akin to pouring gasoline on a fire. Why is this an important point? Because testosterone therapy not only helps these men feel better, it also helps these men live healthier lives by reducing their risk of disorders of aging, such as heart disease and diabetes.

Medicine is all about change, and Dr. Comite is at the leading edge of much of this change. She knows what men need in order to live optimally healthy lives. The traditional pillars of good health—nutrition and exercise—are still important, but to have true health and fitness, and to be on top of the game, men need to know about much more. In *Keep It Up*, Dr. Comite explores the importance of muscle, fat, blood sugar, insulin, diet, exercise, and overall metabolism. We are complex, biological hormonal machines, but Dr. Comite makes it all understandable so that you can take charge of your health.

Congratulations on picking up this book. Now read it, and get armed to live life well.

—Abraham Morgentaler, MD, FACS

Associate clinical professor of urology, Harvard Medical School

Author of *Testosterone for Life* and *Why Men Fake It*

Founder and director of Men’s Health Boston

menshealthboston.com

INTRODUCTION

Welcome to the century of personalization. Everything in our world is connected to you, the individual consumer. When you fire up your computer, your browser shows advertisements customized specifically for you based on what it has surmised about your likes by monitoring your search activity. Online stores will send an e-mail touting new ski goggles this week because last week you ordered a new snowboard. And iTunes offers artist suggestions based on your playlist. Soon, if Japanese inventors have their way, your car will recognize the highly personal imprint of your rear end—thanks to 350 sensors in the seat—making comfort adjustments and turning the engine on for only you to thwart car thieves.

Our 21st century medicine is becoming equally as personalized and integrated. I call this movement *Precision Medicine*. It's the simple idea that you are very unique, and as such, the decisions regarding your health care should be based on you, that unique individual, not some cohort of thousands of people who are similar but not quite *you*.

This futuristic style of medicine focuses on preventing disease long before an illness or disorder shows up as symptoms. How? By analyzing the most comprehensive and minute details about your body and your life—your daily choices, the foods you eat, the exercises you do, the controls and switches within your genes that turn on or off based on the lifestyle decisions you make day to day and year to year.

Mainstream medicine doesn't currently work this way. It's not at all individualized. Mainstream doctors practice what's called "evidence-based medicine," meaning they make a recommendation or choose a course of treatment based on evidence, that is, what clinical studies involving large groups of people have found to be prudent and effective. But you are not a large group of people. You are you, with a unique medical profile, family history, and lifestyle. You are different from everyone else in some way or other, even, yes, if you are an identical twin!

Precision Medicine takes this into account. Integrative doctors, like me, look at the whole person through the lens of a high-powered microscope, to use a science analogy. We want to know everything about your health and encourage you to become a student of your own physiology. Because with this knowledge comes the power to make meaningful alterations that truly prevent disease.

With this proactive, preventive health approach, you will be able to track your progress over time with a specificity that is unprecedented. It will reinforce the idea that you are an individual who is ultimately in control of his own health. Now, you may be thinking that you are a product of your genes and there's little you can do to influence the cards you were dealt (I thought so too once upon a time) but more and more evidence suggests this isn't the case. Even identical twins are different, and believe it or not, all of us can alter the expression of our DNA. For example, if specific genetic markers reveal an increased risk of a heart attack, you can actually neutralize your risk by eating lots of fruits and vegetables.

This book is designed to teach you how to evaluate and quantify your own health and make key lifestyle-changing decisions that will dramatically increase your health span, the length of disease-free active and energetic living. You know your body better than anyone. You are the writer of your own story. In these pages, you'll meet men just like you who are enjoying the benefits of good health because they saw where their stories were headed and they took charge of their bodies in time to write new chapters of their lives. Here is one of these men:

It seemed to have happened overnight. I hit 40 and, boom, my battery was drained. I just felt tired and lousy. I'm in a competitive field—I work for an international government agency—and it requires some type A motivation and effort, so this was a real problem. I asked my doctor to test my testosterone level. “I bet it's low,” I offered. My doctor said, “No, no, no, you don't need to worry about hormones. Low T is normal as you age.”

It took me a while to convince him, but he finally tested me. My levels were very low. “But hormone levels fluctuate throughout the day,” he told me, “and stress affects them.” What he could do was test my testosterone over a longer period of time when my life wasn't stressful. Yeah, right. Like that's going to happen. Stress is the norm for me. I travel regularly to third world countries, real hot spots complete with gunfire and kidnappings. I spent a year and a half in Iraq. So the low-stress thing is never going to happen, and I didn't know where to turn for help until I found an endocrinologist named Florence Comite.

Dr. Comite was convinced that improving my diet and raising my testosterone level would help. She gave me a total makeover strategy: diet plan, exercise, supplements, hormone therapy, and more, but here's the thing: I didn't follow the plan. I took the medications and supplements, used what she gave me to boost my testosterone, but when it came to the exercise and diet, I just didn't do the work. Six months later, I'm back in her office, and she can see in my body and in the lab data that I'm not doing everything she said to do.

“Look at your numbers,” she said. “Your body is primed to take advantage of all this. You're in the sweet spot. Your gains will be huge, but you have to follow through.”

That motivated me to follow the program. Next thing I know, my pants don't fit anymore. Within 6 months, I lost 16 pounds of fat and gained 24 pounds of muscle. My body fat composition improved, decreasing by almost 10 percent to 18. My muscle, my attitude, my stamina, and my overall health are like they were in my twenties. I never thought it would be possible.

—**Kirk Hansen**, age 49, government official



Remember how it used to be? In your twenties, you had a much more intense sex drive, you were ready to do battle at any meeting, whenever necessary, and you still had energy to spare to go out after work or play a pickup game of basketball with your buddies. You could burn off a few pounds in a weekend. You could eat almost anything you wanted and not gain weight. You could run to your heart's content and not feel it in your knees. You could party on a weeknight and still get through a tough day at the office. There was nothing you couldn't accomplish. You felt certain. You felt decisive. You felt invincible.

These days you may be feeling a bit different. Maybe you're hungering for those glory days, perhaps you're just hoping to have enough energy to make it through the afternoons at work. The

feeling of toughness has softened into apathy, a weary acceptance of the passing years. As the understanding of your own mortality deepens—the wrinkles on your face, the inches around your waist, the nagging health problems, all supporting evidence that, yes, you aren't in your twenties (or thirties) anymore—perhaps you don't even care. But there's a way to get you back to that sweet spot. It's not gone for good. You can have that quality of life again. You are *not* helplessly sliding into old age. You *can* get back to the top of your game; you *can* have the energy, the drive, and even the health of a younger you. It's *possible*.

As an endocrinologist who has worked predominantly with men in recent years, I've witnessed major turnarounds in the health of hundreds of men—the reversal of type 2 diabetes and cardiovascular disease, even the repair of heart tissue damaged by heart attack. I've seen men go from having no sex drive to asking me to dial it back a bit because their wives are exhausted from all the attention. I've had 50-year-old patients who looked 10 years younger within a year; men who were overweight and out of shape who became highly energetic and seriously sculpted; athletes who fell sidelined who were able to fulfill youthful dreams of playing their favorite sport again, now at a higher level than they ever thought possible. I am going to help you accomplish the same things my patients have accomplished. I'll give you the tools and guidance you need so that you can become the healthiest version of you, enjoying life to the fullest until the last moment.

Losing your game is not inevitable. What I'm proposing for you is what I call Precision Medicine, a strategic approach to disease prevention that is based on real cutting-edge science and clinical evidence. You can do a 180 and retrieve your energy, strength, libido, erectile function, mental clarity, and more, just like you had when you were a younger man starting out in life.

WHY YOU'RE FEELING THE WAY YOU DO NOW

I'll spare you the clichés of the most obvious symptoms of an aging man. It's time for a new understanding of what's happening at this moment so that we can develop a more productive response to the semiconscious feelings of despair that drive some men toward the destructive midlife crisis. This is what I hear from men: *I don't feel so great anymore. I'm not at the top of my game at home or at work. My kids are running me ragged. Working out doesn't work anymore. I want to feel strong and energetic again, but nothing I do seems to work. I feel like I'm turning into my father and slowing down.*

Well, you're not stuck; downward is not the only direction you can go. There is a physiological explanation for how you're feeling, and you can do something about it. You can change how you look and feel by taking ownership of your health.

ENTER ANDROPAUSE

What's causing you to feel the way you do has a medical name: andropause. It's derived from the Greek *andros* (man) and *pauses* (cessation). Like menopause in women, andropause is a gradual hormonal change that occurs naturally in your body over the course of a decade or more. Beginning in your thirties, your body starts to slow its production of male hormones, primarily testosterone, the main sex hormone and the “rocket fuel” that has powered your health, energy, sexuality, and state of mind for most of your life. Testosterone production continues to decline in your forties and fifties. By age 65, more than 75 percent of men have experienced andropause, the most significant measurable indicator being low testosterone, or “low T.”

You've likely seen the low-T commercials on TV during ball games, advertising testosterone gels and creams. Andropause and low T are gaining media attention, and doctors, too, are starting to recognize symptoms in their patients when only a few years ago most physicians did not believe the

was a menopause equivalent in males. The relationship between your hormones and the way your body functions is rather linear; unlike in women, though, hormonal decline in men is subtle and often undetectable from day to day, month to month, even year to year. Still, you can recognize it if you know what to look for. As testosterone diminishes, you feel the reduction in lean muscle, it becomes harder to lose fat, especially around the middle, and you put on weight faster. The abdominal fat tends to be dangerous visceral fat—the kind that forms on your organs and pushes out a belly that feels hard and solid and increases your chances for having a heart attack. Mentally, you're not as clear as you once were. You're dealing with lethargy, low libido, insomnia, mood changes, lack of clarity, listlessness, and more. Yes, all those complaints that many people think are natural side effects of aging. One of the most noticeable signs of low testosterone is the loss of those morning erections that used to salute the start of your day. You begin to lose your drive, your tenacity, your focus, and your competitiveness. Again, these changes don't occur overnight; often they fly under your radar, surreptitious entrance. You'll cross a threshold, which is different for everyone, and you may not be aware there's a problem until your doctor says you're a prediabetic, or you have a heart attack. All of a sudden, it's real for you: You're aging. You have a disease that once applied only to your grandfather, or maybe your father, not to you. It's been brewing for years—you've either ignored the insidious signals or explained them away: *Work is tough. I'm tired. I'm traveling a lot. My wife and I have been together for a long time, and things aren't as exciting as they used to be, but we're okay. Sex isn't as important now. Besides, we're busy with the kids.*

This is the norm, but it doesn't have to be this way.

It seems inevitable that your health declines as the years pass. Peak health is typically in synchrony with your best reproductive years, your late twenties. After all, nature didn't intend for us to reproduce for the rest of our lives. However, because medical knowledge is expanding so rapidly, we don't have to sit back and accept nature's plan; we don't have to give up or give in. We can intervene. You can take advantage of new insights and technologies to evaluate your state of health and take charge of the rest of your life so as to prevent the diseases that put the face on what we see as aging.

Medical science is starting to see the relationship between the shifts in your hormones and what you're feeling. We don't understand what we don't know. I say this a lot, and it's true. Clinical studies are (just) beginning to show correlations between the drop in testosterone and the onset of the disorders of aging like heart disease, cancer, diabetes, kidney disease, and more.

Modern medical care focuses on treating your major organs—your heart, lungs, and digestive system—and has failed to recognize that changes in hormones play a significant role in your entire body. And although we recognize that hormones impact adolescents as they go through puberty, until recently we haven't given hormones the same consideration as we age. We can't look at organs or even organ systems in isolation anymore. In medical school, I was trained to examine organ systems while not necessarily acknowledging them as communicating entities. Hormones are the messengers that allow the various systems to work synergistically to carry out your body's processes in an ideal setting. If our hormones fail to work in an optimal manner, you can imagine what happens to us as a whole. Through more than 30 years of clinical research and patient care, I've learned how to listen to the orchestra, the separate sections, and singling out individual instruments as appropriate. There's a dialogue that's going on between all your parts, each interacting and influencing every other element in the highly complex ecosystem that is the human body. Understanding that dialogue, which is taking place on the cellular level, is part of the future of medicine. I predict that the practices I will describe on these pages will be the standard of health care within 20 years. But you don't have to wait that long. You can benefit now by learning much more about your body and how it's changing, and by taking personal responsibility for its optimal performance.

FATHER KNOWS BEST

In medical school, I was taught the foundation of health and disease concepts and was given the tools and the skills to question the validity of evidence and research. That was important, yet it was watching my father age that opened my eyes to the possibilities of preventive maintenance. Dad was ahead of his time—he was passionate about maintaining his strength, as well as preventing health problems by working out and watching his diet. He exercised religiously into his nineties and lived a healthy life right up to the end.

Dad wasn't just dedicated to keeping himself healthy. He had an insatiable curiosity about how he could do things better, what he could learn, what more he could do. As I evolved as a doctor, he would ask me the same set of questions: *How do I stay healthy? What should I eat? What should I do?* Every time I began a new field of study in medicine, he'd ask me again. So I kept looking for more answers—for my father, myself, and everyone else.

When I was younger, I was frustrated with our medical system as I saw it. I was trained traditionally in diagnosing and managing disease, as a reactive approach, after a disorder had already showed up waving a red flag and announcing, "I'm bad news." Med school emphasized figuring out the diagnosis when a patient presented by putting together a "differential," that is, listing, in descending order, the most likely reasons that would explain a set of symptoms. We were, and still are, mostly focused on stamping out disease, putting out fires, and helping sick people. These are all noble causes, but it seemed clear to me that if you could start the intervention *before* symptoms arose, you could accomplish much more. You might even be able to keep people from getting so sick in the first place.

The sad truth is that often doctors don't have enough time to educate you on all the details that you might see. Or, at your annual checkup (you are going every year or so, I hope), your "slightly" high blood sugar level or "borderline" cholesterol lab results are minimized, perhaps to avoid frightening you. It takes time for a thorough analysis that will expose imbalance in your system early on. Our traditional course of medical delivery is intervention that waits for disease to appear, symptoms to be obvious, signs to be palpable, labs to be grossly out of range. Instead of looking at the signals of the disorders of aging in our thirties, forties, and fifties, we—and particularly men—frequently wait until the chest pain occurs or we develop a persistent cough or an infection that doesn't heal.

My father's questions about how to stay healthy kept bringing me back to why I wanted to be a doctor in the first place: to keep my patients healthy for as long as possible, to *prevent* disease. My father's life choices prompted me to find out more about how to accomplish that goal and ultimately led me to change the way I thought about medicine and healing individuals.

I want to invert the model and identify risk before your doctor is forced to take heroic and immediate action—in order to prevent the truck that nobody saw from plowing you down in the form of a heart attack, diabetes, cancer, or kidney disease. That metaphorical truck didn't just appear out of nowhere. It started its journey toward you hundreds of miles away. It might have begun a generation or two before you were standing at that critical intersection. That accident waiting to happen was possibly laced into your DNA and brought about by lifestyle. Yet, mainstream medicine is set up only to intervene when the truck is barreling down on you—when the threat of disease is looming and possibly reversible only through aggressive intervention. But you can redirect the truck on to a new route by paying attention to yourself, gaining a deeper understanding of how your genetics and lifestyle choices impact you. That's the kind of medicine I want to practice. I want to improve whole lives rather than fix diseased parts. I want to help people invest in their health as active participants rather than as consumers of medications. Fortunately, the tools and the knowledge to do that are here, and more are just on the horizon.

The other thing I learned from my father is that there is a direct relationship between how well you know yourself—which means being totally honest with yourself about how you eat, act, think, and live—and the kind of care you are able to get. When I would push him to go to a doctor before he was ready, he would say to me, “What is he going to tell me that I don’t already know? I live in my body. I know what it feels like. I keep a record of it. I will know when it’s time to go see the doctor.” He was pretty much right every time.

You too can become clued in about the state of your body. You will gather the details of your habits, your health, your family’s medical history, and combine this with the numbers from your lab data. Observation and tracking changes over time is the key, and I give you the tools so that you can build the same personalized health portfolio that I help my patients create. You read bank statements and quarterly reports all the time. You understand what the numbers mean and you know how to make adjustments to turn around situations that are going in the wrong direction. What you’ll do as you read this book is similar. You’ll learn to read your own numbers—everything from body composition to the results of your blood work—just like you read financial statements. You’ll see within your own lab test results where you’re moving in the right direction and where you need to focus more. Knowledge is power, and with the right medical wisdom and guidance to help you interpret the data and implement solutions, you will have the best foundation possible for a long and vibrant life.

THE BIG PROMISE: YOU CAN FEEL 25 AGAIN!

We all get older. Chronological aging is unavoidable. But how you age is well within your control. By taking direct, tangible, proactive steps, any man, at virtually any age, can return to prime physical condition, restore energy, sharpen his mind, revive his sex drive, and, believe it or not, regain the metabolic and hormonal functioning of a 25-year-old. That’s right. Biologically, you can be 25 again.

You can turn back the clock. Reclaiming the body and the physical and mental performance of a younger you is absolutely possible. I see it every day in my patients from around the world and have hundreds of success stories to prove it. In this book, you will meet some of those men who have turned their health around. There’s also real research and real science to back up this new aggressive, proactive approach to health. Here’s what you can expect.

- All the symptoms that you’ve been grappling with for years will likely improve within months, maybe weeks. The initial changes that happen very quickly are in those nagging issues that you think are part of daily life. For example, can’t go without your 3:00 p.m. nap, and your golf game has slowed down to 9 holes instead of 18? Do you have difficulty getting an erection? You can expect to turn all these around in a short time. Shifts can happen that are very up front and very immediate. If you choose to pay attention to your exercise, diet, and other habits, change is not just possible, it’s probable.
- With time, you will begin to recognize and appreciate the cause and effect of the positive changes you make. If you’re a prediabetic or diabetic, you’ll be able to reverse that. If you have high cholesterol, you will see how lifestyle changes will bring those numbers down. You will see tangible, measureable results and these will be reflected in your precision health analysis. You’ll lose weight and need to buy new clothes that fit. You’ll have more energy. You’ll see your muscles through your T-shirt. All the superficial stuff of New Year’s resolutions and reality TV shows will improve. More importantly, through sleep, stress reduction, diet, exercise, key medications, and supplements, you will begin remodeling yourself from the inside out, becoming healthier and even feeling younger.



I get great satisfaction from seeing my patients live the life they want, actually getting more energetic, confident, stronger, and more active with each birthday. Given the fact that the average life expectancy of a man has grown significantly over the past 50 years, you need to focus on extending your personal *health span* in order to keep up with your extended *life span*. Healthy longevity means being vibrant, active, happy, and pain free well into your nineties. It's within your power to maintain and even improve your well-being for as long as possible. You want to live life to its fullest as you do in the prime of your life. I want you to keep your confidence, energy, drive, power, ambition, and control. Together we can ensure your good health for years to come.

[Many of my patients have graciously allowed me to use their personal stories as examples in this book. Some have given permission to use their full names, while others have chosen to remain anonymous and use a pseudonym. I am grateful to them all for sharing their testimonials in the hope of helping other men. –FC]

THE GAME IS CHANGING

Can your body keep up with what modern culture expects of it as the decades pass?

The realization that I wasn't what I used to be came a couple years ago when I was in the Congo tromping through the jungle. I'm a photographer. Jane Goodall was there, and she's 77 and kicking the [crap] out of the entire crew. All these guys couldn't keep up with her. Throughout my career, I'd always been the strongest guy on my crew. I'd be in Dubai running up a sand dune leaving my younger assistants in the dust. But suddenly that was over for me. I'd lost that. I could feel myself failing. It was horrible. When I got my blood work back from Dr. Comite, my cortisol [stress hormone] levels surprised me. I know what it feels like to be stressed out, but I'd never seen being stressed out illustrated as a number before, chemically. My testosterone levels were low, of course, and whatever improvements I could make to my physical infrastructure through hormone treatment and exercise was my primary concern. I didn't just want to be better. I wanted to be optimal. I'm competing with the best in the world.

I felt results right away. I had more energy, and now Dr. Comite tells me that I've essentially reversed the aging process in most of my measurable tests. Travel is still the biggest obstacle for me. I avoid the junk foods that are easily accessible, like in hotel minibars. Also, I've never had a steady, normal schedule. In my work, I have to keep a second suitcase packed at all times because I don't know when or where I'm going next. So I work very hard to eat right and stay on the program no matter where I am. I rededicated myself to the good things I had already been doing while including the newer ideas from Dr. Comite and her staff, such as adding intervals to my workouts. My God, has that helped me! I am now out on a shoot and not even feeling it.

–VINCENT M., age 53, photographer

The baby boomers have forever changed what a 40-year-old looks like and what he can do with his body. The transformation began in the 1980s, when many people started exercising more and eating better. They also were starting their families later in life. All this got pushed up again

the wall of the body's natural slowdown, and the health impact became obvious. It used to be you might live into your fifties, dying from the disorders of aging instead of surviving to deal with the complications. Today, you'll likely live into your eighties, so now the question becomes, *How will you live those added years? How will you sustain health beyond your peak?* If life begins at 40, the saying goes, then we need to make sure the body can keep up.

Here's the problem: Countless men hitting their forties come into my office and tell me that everything seems like it's just grinding down—that their best years are over. If you're feeling that way, and facing four more decades of life, that has serious implications.

Growing older in the current medical climate isn't pretty. It's full of knees that don't work, bad guts that persist even after you stop drinking, a disappearing sex drive, and a steadily weakening body and mind until some debilitating disease takes you out. It doesn't seem fair or practical. Our quality of life is suffering, and our health care system is crashing because it wastes billions to manage chronic disorders year after year. We have extension of life but not extension of health. I don't want to see folks in the last one, two, three, or even four decades of life having few choices in how they live except to cater to the complications of avoidable diseases.

You will likely live longer thanks to modern medicine, and you too can be like my dad and live to see your nineties. If you take action now, you can age in good health like my father fortunately did. He took the initiative to eat right and exercise. He monitored his health and challenged himself to improve in a way that people usually don't do on their own. My father was the first person to shape my ideas on Precision Medicine. Knowing yourself and taking ownership of your health will help you keep going strong physically, mentally, and socially. Doctors may not always ask the right questions, so it pays to be aware as Livingston Miller's story illustrates.

I'm a trainer, so I eat right and I stay in shape. I've appeared in ads all over New York City for a gym, advertised as the picture of health. I was training Dr. Comite and talked to her about some of the problems I was having—getting dizzy periodically, feeling thirsty all the time, and fainting. I was drinking a lot of fluid and urinating so much that I cut back on water. When I had gone to another doctor, he thought I was dehydrated because of my intense physical activity. He wasn't alarmed by my elevated blood sugar either because I ate five meals a day. I even passed out a few times and was brought to the ER. There, they had no idea what was wrong with me, even with multiple tests, CAT scans, too. My symptoms persisted, and Dr. Comite was hearing my frustration. After another episode when I passed out just after snacking on a protein bar at the end of a long day of golf, I told Dr. Comite, and she got me evaluated right away. When the lab test results came back, I was in for the shock of my life. I was a diabetic. Then I underwent a VO₂ assessment, and the findings caused her to suspect that I had had a silent heart attack sometime in the past. Next I underwent a nuclear stress test, which confirmed the muscle damage in the inferior portion of my heart. My cholesterol was 240. I got onto her program, lost 20 pounds, and turned the diabetes around completely with supplements and eating the right food at the right times. I got my cholesterol down and have been repairing the damage from the heart attack.

—LIVINGSTON MILLER, age 59, personal trainer

Livingston's symptoms were classic signs of diabetes. Before I brought him in for testing, I asked him, "Who in your family has diabetes?" His response: "Everyone." That didn't surprise me, and indicated that I was on the right track. After I ran his blood work and saw his sugar metabolism numbers (see his hemoglobin A1c shown on [this page](#)), my hunch was confirmed. If he had been asked about his family history earlier, the other doctor might not have glossed over his high blood sugar. If doctors had more time with patients, we could get to know them. By asking the right questions, we would be better able to identify such warning signs. That's why you have to know your family's health history and your own health data, a process I'll help guide you through in this book. With that knowledge, you'll be the one to optimize your own health and ensure the quality of your life at any age.

Livingston has done a health 180. What did he change? He's getting adequate sleep; he's practicing stress reduction; he's training properly for his body—significantly cutting back on the resistance training, replacing it with more cardio. He's mostly eating the right food regularly throughout the day and is drinking less wine too; he's taking supplements and even some medications for balance. I have him on a statin for his cholesterol because I want to see it lower than the 180 milligrams per deciliter (mg/dL) he has been able to attain with lifestyle changes. I've also started him on testosterone, which has benefited his metabolism. For Livingston, it's *game on*. Now he has the chance to keep his edge for the rest of his life. If he stays on track, he will likely be in good health for decades to come despite having hit a rocky patch in his late forties.

But imagine if Livingston's disorders of aging—heart disease and diabetes—had gone undetected. His future might have looked as it does for many seniors facing constant hospitalizations, with limited mobility and mental faculties. I don't want this to be the way anyone lives their last years. And it doesn't have to be.

I've been a doctor for 36 years. I studied and taught medicine at Yale Medical School at Yale University, and I've been fortunate to work with some of the brightest minds in the medical world. I'm an endocrinologist, which means I look at communication throughout the body through the interaction of hormones and proteins, these agents in essence determining much of how we think and feel every day and over the course of our lives.

Which 84-Year-Old Do You Want to Be?

I've shrunk to about 100 pounds. I have diabetes and I'm in the hospital after breaking my second hip. I was home for only 3 weeks after the repair of my first hip fracture. My wife and son are by my bedside constantly, and I'm not able to eat much. I'm failing fast, and I feel I'm helpless. After being strong all my life, I never thought I could become so frail.

—SAM, retired electrician

I founded an investment banking firm over 40 years ago, and I never imagined that I would stop working. I wanted to be able to get into the office at least twice a week; still, even that was becoming impossible. It was pretty depressing to feel incapacitated. My available testosterone level was 14, and I was told that was less than you'd find in a boy, not even a teen. I started on testosterone and several supplements, including DHEA (dehydroepiandrosterone), vitamin D, coenzyme Q10. Within a few weeks, I'm not only at the office every day, I'm in the gym every day too. I even wake up with erections. I hadn't seen that action for years! I feel stronger, with more energy. My whole attitude has changed.

—GEORGE, investment banker

I've had the opportunity to study the human body in all its stages: in utero; early childhood; school age years; the teenage years, when hormonal surges trigger puberty; the twenties, when the body reaches its physiological and reproductive peak; the thirties, when hormone production begins to shift.

and dial back; the forties, when physiological and reproductive challenges usually become noticeable; the fifties, when health and disease consequences may develop, the product of unchecked disorders; aging; and the sixties, seventies, and so on.

The usual model has been to try to repair the body's malfunctioning systems and parts with medicine, which commonly shuts down any remaining functionality, creating a lifelong dependence on pharmaceuticals. When you replace thyroid hormone, for example, the thyroid gland stops working, and you are likely to need alternative sources of thyroid hormones for the rest of your life. My passion has been to find a way to help the body regain balance naturally, when possible, to restore sluggish metabolic function while triggering optimal hormonal activity. Lifestyle factors like sleep, stress, sex, nutrition, and exercise all impact the body's operation.

I've done clinical research at both Yale and the National Institutes of Health (NIH) that required thinking about how to help the body do a better job of taking care of itself when something isn't functioning well. My early focus was on pediatrics, specifically puberty that occurs too early, and later I helped develop Women's Health at Yale. My role, at that point, was to serve as a consultant. Often many patients were interested in participating in my research trials on hormonal function once they met me. I wasn't a primary care doctor but the person a specialist conferred with when a patient was not making progress, a diagnosis was proving difficult to determine, or alternative management approaches were needed. A gynecologist might send her patient to me, for instance. I would assess the patient's health, make a diagnosis, then make recommendations, some of which may have derived from my research efforts. I acted as a tertiary consultant in many cases in that I conferred with specialists, but I didn't replace them or the primary physicians.

In the 1980s, I began to hear many stories that sounded similar. Women would tell me that they didn't know what was happening to their bodies. They felt lethargic, anxious, and generally just not like themselves. Some of these women were medical researchers and writers who had access to the literature, and they still didn't really know what was wrong. They would tell me: "Nobody seems to be able to answer my questions. I was told it's all in my head." Diagnoses were anything but physical—often empty-nest syndrome, depression, or something similar. Many of these women were given prescriptions for diazepam (Valium) or chlordiazepoxide (Librium). They were told to adopt a puppy. They were told to get over it. These women, baby boomers who were starting to feel the effects of aging, considered these answers unacceptable and kept searching for different solutions.

What became clear to me was that these women weren't being taken seriously and they weren't going to stay silent. They were not like their parents, who would rarely challenge their physician. Plus they were part of the sandwich generation, raising a family yet also largely responsible for the care of their aging parents, who often were in poor health. They were concerned about following in the same path, adding burdens for their own children in the future.

As an endocrinologist, I knew that their hormones were in transition, declining each year. The cascade was producing a physiological change that was fundamentally transforming their bodies and shaping their minds, attitudes, and energy. Then it clicked: This time in life—menopause, for women—was an unwinding of what had begun to wind up in puberty. This epiphany led me to start down the road of appreciating how we can optimize the body's function to prevent the downward slide that we had assumed was inevitable with age. We could do it by bolstering the body's ability to regain hormonal balance. And if this was true for women, it was probably true for men as well.

Unexpectedly to me, the number one complaint I heard from women over 40 was actually not about their own health or the fact that they had put on a few pounds. It was about the failing health of the husband or male partner—their man's lack of energy, his weakening of libido. What's more, women were not only complaining about their men, they were losing interest in their partners because of it. The failing health of their husbands was the number one reason many women cited for having affairs.

The more I studied men over 40, the more I began to see a pattern of change for them, similar to menopause in women. Most of the men I was seeing had hit the same wall. They were exercising but getting no results. Recovering from workouts or injuries was becoming harder. They were eating right and still gaining weight, even the competitive athletes. For many men, their sex drive was disappearing. They didn't have the energy to do anything outside of work. And they couldn't keep up at work in the same way as they had previously. Their enthusiasm for any or all of their passions was limited. Many of them were trying to do everything they thought would give them a long and healthy life, but they were feeling worn out.

I wanted to understand why they were having these issues and figure out how to improve the quality of life. I was captivated by the developing field of andrology. I was particularly interested in how the brain's hypothalamus and pituitary signaled the testes and the gonads to produce testosterone (T)—a hormone that directly impacts a man's metabolism, muscles, and major organs.

What I knew was that I didn't know enough. I had to dig for more information, especially about men's experiences. Years went by and I couldn't find an organized field of study geared toward protecting the health and energy of men as we were doing for women. In 1991, the NIH in Bethesda, Maryland, had established the Office on Women's Health; no comparable office exists for men almost 25 years later. Throughout my tenure as a faculty member at Yale, I held a triple appointment in the departments of internal medicine, pediatrics, and gynecology. Andrology was conspicuously absent. In fact, while gynecology departments exist in every academic medical center, the few select andrology departments primarily focus on male infertility. More recently, several medical universities have launched health centers for men. Still, it is a field of medicine that isn't formally defined, nor is training readily available. Andrology is still in its inception.

It is clear that hormones are as important to men as they are to women. So why were men being overlooked? Not surprisingly, there have always been inequities between the sexes in terms of health care and research. Most research in men, in contrast to that in women, has been geared toward studying the major organs, like the heart, without focusing on metabolism and hormones or overall health. Men generally have not sought out answers to issues related to aging. You will see that we have begun to realize that heart disease (particularly the risk of having a heart attack) is associated with erectile dysfunction, which I will explain in more detail in [Chapter 6](#). Many doctors still do not know about or agree with the data that has been published in renowned journals such as the *American Journal of Cardiology* or the *Journal of Urology*.

HOW YOUR BODY IS CHANGING

If you zoom out to the 30,000-foot view, you can see the pattern of change over your lifetime. Recall when you were a very young man, almost a kid. Think back to how you fought for what you wanted in your twenties and early thirties. Do you have that kind of energy and drive in your forties? Making this comparison will help you get a better sense of the contrast between where you were then and where you are now. You more than likely had more testosterone back then, and that helped you power through.

Let's look at how men's bodies change over the decades. The word "individual" is an important one here. Remember puberty? Some boys hit it at 11, some at 13, and some even later, at age 16 or 17. By the end of high school, almost everyone has experienced similar maturation changes to some degree. That's what you need to keep in mind throughout this journey: Aging is fiercely individual, yet inevitably universal.

THE TWENTIES

If you're a baseball fan—and I love the Yankees—you may know the conventional wisdom that says most players peak during their age-27 season. I believe this might be an official baseball fact as far as batting or pitching stats go, barring the illegal use of steroids over the past few decades. What you may not have known is that general medical science backs up this assumption: Men are at their peak around their middle to late twenties, depending on the individual.

Testosterone levels are generally at their highest too. Bone foundation and muscle strength peak at this time as well because of the more abundant T. You feel at the top of your game with respect to virility, physical performance, and energy. You feel confident and invulnerable. This feeling is not just a psychological state; it is directly influenced by your hormones, by the strength of your endocrine system and the amount of testosterone you have circulating through your body.

THE THIRTIES

As you march through your thirties, you may or may not notice some day-to-day changes such as the following:

- You can't party all night on a Tuesday and be fully alert and ready to go to work Wednesday morning.
- Even if you don't party, you can't burn the candle at both ends. Long hours at the office, poor sleep, and stress take a toll on your performance, unlike a decade earlier. You used to be able to work 12- or 15-hour days without stopping on the weekends. Now, if you try to push straight through, your thinking becomes fuzzy. You may find yourself nodding off at your desk or even in the middle of a meeting.
- When you work out, it's not as productive. You can't increase stamina. You used to notice results after a week or two, but now the time at the gym isn't having much impact. You're trying new exercises but not putting on muscle. When you overdo it, it takes a few days, even a week, before you can get back to exercising because your body just hurts too much.
- Your body isn't as taut as it used to be, and that's because you are losing lean muscle mass—the main protection for your bones and your immune system. Decline in lean muscle mass accelerates with every passing year unless you take action to reverse it.
- When you want to shed weight, it's a bit tougher. It used to be you could knock off 5 pounds after a couple of long runs or by cutting back on food for a few days. Not anymore. No matter what you do, you seem to keep gaining weight.
- You aren't as hungry as you used to be. And I don't mean for food. I'm talking about everything you've lusted after: achievement, money, sex, competition. The edge isn't as sharp. The drive just isn't there.

THE FORTIES AND BEYOND

Now is when you start seeing the real visual signs of aging: You're needing reading glasses when you had perfect vision before; you grow hair everywhere, except your head; you develop skin tags, jowls, a wrinkled neck, and laugh lines. Your morning puffy eyes stay that way all day. Your skin is dry and wrinkled because it becomes thinner with less elasticity and collagen as you age. You've got more visible spider veins in your legs, as venous valves become less competent in driving blood back up to the heart. You've got bluish streaks on your face and nose, typically due to excess alcohol (think W.C. Fields) or other underlying triggers (more common in fair-skinned folks with rosacea). All of these things no longer resolve as easily as in your youth. And there's more:

- You are experiencing daily aches and pains in body parts you didn't even know you had.
- Your knees hurt after a run or when you climb up a few flights of stairs while carrying a heavy computer case.
- You start wearing your pants lower on your torso to accommodate the overhanging belly. Even when you diet and drastically cut back on calorie consumption, the weight doesn't come off. If you do lose a few pounds, it quickly comes back.
- You see serious and even fatal diseases in people who are in your age bracket. You may even know a close friend or colleague who has suffered a fatal heart attack.
- You blank out on a co-worker's name, someone you see every day. You can't recall memorized facts. In fact, you can't even memorize facts anymore.
- If you don't write it down when someone tells you something in the hallway, you won't remember it by the time you get back to your desk. Your short-term memory is not as dependable as it used to be, and it becomes even less reliable when you are worried or under stress. You find yourself wondering where you've left your reading glasses or end up squinting to read.
- Traveling beats you up. You can't take a red-eye and then head straight for the office after a quick shower. Instead, you need to sleep for a few hours, so you find a way to work from home.
- Your workouts just aren't working out anymore. You don't get to the gym as often because there isn't enough time. When you do go, generally you don't see much in terms of results. It may take a while to recover from a tough training session. Exercising feels like a waste of time.
- You don't get morning erections like when you were 25. Testosterone production has significantly slowed down, this process having begun for most men in their early-to-mid thirties. Your brain is already feeling the effect of receding levels of testosterone, as the cells responsible for turning your hormones on are turning off. Your libido is not surging as it did in the past.
- Even if you get some morning erections and still have a fairly strong libido, you're generally not checking out every object of sexual interest on the street. You've begun to accept your diminished sexual drive and activity, like this patient of mine.

“I used to be able to do it every day, but my partner doesn't really want much anymore, so I'm not worried about it.”

And another patient who explained:

“We've been together a long time. Things aren't as exciting in our marriage as they used to be, and I'm really stressed about work, so I'm just not as interested in sex as I used to be. Plus, the kids end up in our bed during the night.”

They may be right. These reasons do contribute to a slowdown in sexual activity. However, infrequent morning erections and other physical signs are not completely under your conscious control. Beneath the surface, the physiological mechanisms that lead to desire, erections, and more are less active, inevitably slowing you down.

As you move past 45, the decline accelerates. At that age, more men will be noticing more symptoms. Put ten 35-year-olds together in a room, and maybe 1 or 2 of them will notice that the

aren't quite as energetic as they used to be. When that same group hits 40, it might be half of them. At 50, it'll be 8 out of 10. By the time they hit 55 or 60, it's likely all 10.

WHY IS THIS HAPPENING TO ME?

Hormonal levels vary dramatically throughout life, and even over the course of an hour, depending on maturation and the individual. They increase and decrease as the hypothalamus and the pituitary gland respond to alterations in circulating hormones and proteins. Hormones—whether testosterone, thyroid hormone, insulin, cortisol (the stress hormone), or any number of others—affect your drive, energy, attitude, and emotion. They influence every system in your body, regulating how you metabolize food; how your arteries expand to circulate blood; how your brain functions; how you focus; whether you want to eat, have sex, sleep, or exercise. As hormones diminish along with the signals from the brain to produce them, you begin to slow down.

When the hypothalamus and pituitary sense a downturn in the circulation of testosterone, for example, this should trigger the release of brain hormones that stimulate the testicles to ramp up production of testosterone. The specific brain hormones include gonadotropin releasing hormone (abbreviated GnRH), which is released by the hypothalamus, and luteinizing hormone (abbreviated LH), released by the pituitary. They act to control the production of testosterone in synchrony. The response system in your body that triggers the manufacture and release of hormones is a negative feedback loop. When this loop is functioning at its best, the body gets enough testosterone to bind to receptors on the various organs that require it.

In the bodies of men as they hit their thirties and forties, testosterone falls approximately 1 to 2 percent each year. Men entering their forties may have levels that are too low to maintain peak metabolic function. This leads to decreased muscle mass, a gain in fat (especially in the belly), less energy, sapped libido, erectile dysfunction, brain fog, and more. Not all symptoms occur in all men, of course. Sleep deprivation, stress, nutrition, exercise, genetics factors, and personal health and family relationships can all influence how you experience those symptoms, which range from mild to severe.

Think of your brain like a baseball coach who is out in left field, literally. It's not paying attention to the decrease in testosterone. Execution is lacking, yet the coach (your brain) keeps ignoring messages to send in the designated hitters GnRH and LH to stimulate the production of testosterone by the testes. Something's definitely going wrong here; your brain has been desensitized to these low levels of testosterone. Scientists don't yet know why, but it's the reality. In fact, this slippery slope can go on unchecked for so long that men in their forties have been shown to have morning testosterone levels as low as that of a boy just entering puberty.

ENTERING ANDROPAUSE

Your team is losing, but your coach isn't doing anything about the low T, and your performance keeps getting worse. The medical term for what's happening is a doozy to pronounce, though it's easy to understand once you break it down. It's called hypogonadotropic hypogonadism. *Gonadotropic* refers to your GnRH and LH, your brain hormones. *Gonadism* refers to your testes and, by association, testosterone. *Hypo*, as you know, means low. Luteinizing hormone, gonadotropin releasing hormone, and testosterone all are dropping below what's normal.

Low GnRH + low LH + low testosterone = *hypogonadotropic hypogonadism*, a downward slide bringing you closer to andropause. This phenomenon typically begins in your late thirties or early forties.

Eventually, testosterone levels drop to such bottom-of-the-barrel lows that the coach has to stop staring at his shoelaces and *do something*. So the hypothalamus and pituitary finally get back in the

game. They start producing lots of the brain hormones, GnRH and LH, to compensate. This triggers the production of testosterone. And it works ... for a little while, anyway. You might get some good runs in; however, your winning streak is likely short-lived. Most of the time your testosterone production gets a little spurt and then falls again.

That's when men enter into andropause. They have a low testosterone and a high LH and GnRH whereas before they had a low testosterone as well as low LH and GnRH. The medical terminology for andropause is *hypergonadotropic hypogonadism*.

High GnRH + high LH + low testosterone = andropause. If you are in your fifties, it is likely that you are in andropause or getting close. Don't feel singled out. This shift in hormonal patterns occurs in all men, although the age at which it happens will vary with the individual. I have patients who became andropausal in their late thirties and others who were not yet there in their seventies. A similar hormonal shift is true for women, however, the age range when it occurs is more narrow, from late thirties to late fifties.

You might not notice the effect of andropause each and every day because it starts to feel more like normal life. That's why it's important that you pay attention to your body and the message it's trying to relay. In the next chapter, I'll show you how you can begin to collect more about your personal health history, family history, and lifestyle to optimize your health. By understanding who you are now, you're that much closer to creating a plan to get back to the vitality you felt 20, 30, 40 years ago.

GAME ON! INCREASING HEALTH SPAN

The goal of medicine should be to help you maintain your vitality for life.

In June 2011, Yankees shortstop Derek Jeter, 37, took major heat from New York fans for not playing like he did when he was 27 years old. He couldn't hit the ball as well as he used to. He was striking out too frequently for an elite athlete. He wasn't fast enough to be the brilliant shortstop the fans had come to expect on the field each night. They weren't happy. Neither was Jeter.

The list of legendary athletes who played past their prime is long: Babe Ruth, Joe DiMaggio, Steve Young, Michael Jordan, Shaquille O'Neal, Willie Mays, Mike Tyson, Magic Johnson, Emmitt Smith, Muhammad Ali, Jerry Rice, and more. It's not easy to find a list of those who decided to call it quits shortly after they reached the peak of their skill level. Swimming champion Michael Phelps is one of the few who comes to mind. Just over a month after his 27th birthday, Phelps swam his final lap on the world stage in the men's 4 x 100-meter Olympic relay. Competing in the butterfly leg of the relay, he went on to win his 22nd gold medal, making him the most decorated Olympian ever. Now Phelps is a self-identified retired Olympic swimmer; in fact, he and his coach Bob Bowman discussed that he wouldn't compete past age 30. (For a while, he was hesitant to even compete in the 2012 summer Olympic Games, after having won eight gold medals in 2008, the most first-place finishes at any one Olympic Game.) What happens next will be up to Phelps, but he has gone on record as saying he will not be competing at the 2016 games in Rio. Phelps knew his superhuman skills were beginning to slip, so he had to scale back his participation and the expectations of his fans.

Whether athletes decline more quickly than the rest of us or just appear to because they are so closely watched by owners, coaches, and fans is a big question. Either way, you can learn a lot from how athletes are treated. In 2011, Jeter suffered a calf injury, which put him on the disabled list for the first time since 2003 when he dislocated his shoulder. He received immediate medical attention. All eyes—fans, media, competing teams—were on him. Even without injury, athletes get year-round care. Owners invest millions in trying to keep their athletes in the best shape possible with the top doctors, physical therapists, massage therapists, nutritionists, coaches, exercise physiologists, and trainers. Every avenue is explored to find ways to increase endurance, strength, energy, and acuity in an effort to make all of it last longer than nature might otherwise allow. I thought how great it would be if we could apply that concept, in an integrated fashion, to an aging man or woman in order to make the most of the years they have.

I started exploring this idea further while developing Women's Health at Yale University School of Medicine, realizing I wanted to investigate the world of sports medicine in a setting where being proactive about your health is vital. In 1998, I was asked to lecture at the Aspen Club Sports Medicine Institute, one of the nation's oldest and most respected alternative health care clinics. There, I had the chance to observe firsthand how top athletes are treated by sports medicine clinicians. The experience stuck with me and taught me a great deal. The doctors, along with other specialists, scrutinized over

every aspect of the athlete's health, beyond rehabilitation, to optimize his or her performance. It was a prototype that resonated with me, similar to what I had begun at Women's Health, bringing the expertise of a team together proactively. I began to think more about how I could apply this concept to everyone. The truth is, you have great years left—lots of them. Your best years as a small-business owner, doctor, engineer, teacher, lawyer, public servant, parent, or partner may be right now, or perhaps even a decade or more down the line. You want to be sure your mind and body are up to the challenge.

When you think about the course of your life, you've probably wondered about how long you'll live. We all know what a life span is, and we all know it's getting longer with advances in medicine and technology. I focus more on *health span*—the length of time you're living with good quality of life that allows for enjoyment of a long life span. My father's health span lasted up until he died in his nineties. My dad never sat when he could stand, and he never stood still when he could dance. One time, when he was near the end of his life (unbeknownst to him or me), another man asked if he was in his seventies, and seemed to think he was doing great for 70; although he was over 90! When I asked my dad, "Why the dancing and constant moving?" his answer was, "My body feels better if I keep going actively." It seemed clear to me that this was the way to go.

As a doctor, I feel that my responsibility is to help people dramatically lengthen their health span and the number of years they enjoy a vibrant, active, youthful, disease-free life. Why have a long life span if you can't live it well? Even to have the drive to stay on your game, you need a basic level of health or you won't be able to push forward and follow a plan to improve the quality of your life. Let's say you have diabetes. You may live to 85 or 90, yet if you don't take care of yourself or improve your carbohydrate metabolism, you may lose your vision or may have to be connected to a dialysis machine. This means having toxins cleared from your body 3 days a week because your kidneys are failing. You're still alive, but how alive? In this case, your health span may run out 25 to 30 years before you die. You don't just want a long life span; you deserve a long health span. The only way to do that is to take a holistic view of your health, and monitoring metabolism and hormones is a critical part of that approach.

In athletes, you see a close-up, high-definition view of your own health span, focused on the time when your body is engineered to be at its physiological best. Because athletes stay within the public eye as they approach middle age, inevitably, as their performance lags, it's easily recognized. It's tough for you to watch; in fact, it feels like a part of you is going down with them. Seeing them in their state of decline makes you aware of your own decline, and that's the last thing you want to notice. You start to ask yourself, *If they look that ridiculous, how must I look?* You let go of Jimmie Connors and embrace Andre Agassi. You let go of Pete Sampras and embrace Rafael Nadal. But wait—in that gap between idols is the moment you could recognize what's happening in your own life. Chances are, though, you blew right past it. You found another dream to cling to, and all was right with the world again. Meanwhile, you can't find another *you*, so instead you turn away from the image in the mirror and cling to the one on your student ID. You're no professional athlete. Still, you'd like to be able to run 5 miles each day, but lately you find yourself winded after 2. You'd like to be able to perform in the bedroom the way you did in your twenties. You might find yourself wondering: *What would it take to get it back?*

CHANGE AND THE IMPORTANCE OF TESTOSTERONE

You are a complicated system made of billions of cells, and those cells communicate with each other. Sometimes, they do so within the same neighborhood, such as within the bone matrix, where cells create and remodel bone. Cells communicate over longer distances, too, from the brain to the testes.

for example. The cells in your body are dynamic, adjusting to internal changes, responding to external stimuli, compensating for poor lifestyle choices. This happens as unconsciously and naturally as breathing; it's also completely individual. The combination of experience and genetics is different for each person. You can now actually capture each aspect of your own function, enter the data, and undergo an analysis using the Precision Health Questionnaire (see [Appendix](#)).

Let's take a brief step back into high school biology class. Forget Jenny, your crush in the short skirt and Devo T-shirt. Instead, focus on Watson and Crick, the scientists who described the double-stranded structure of the DNA molecule called the double helix. You'll recall that your body's functioning depends upon programming within the double helix. DNA triggers the production of a mirror image messenger RNA, which in turn creates specific proteins, hormones, neurotransmitters, whatever message the RNA is tasked with carrying. You may not be conscious of messages to bump up hormone production or metabolize food in a way that maximizes absorption of nutrients and minimizes oxidative stress. Change in the body occurs very slowly, though it's happening every minute. It's not sudden. There's no huge parting of the seas, no neon sign popping up on the mirror one morning saying, "Your heart attack risk begins now." Transformation happens from nanosecond to nanosecond and accumulates over decades. You're usually not aware of a shift in your health until it all adds up and becomes a visible symptom or disease. It could result in a heart attack at 43, cancer at 60. Until then, though, your body is adapting all along. You don't pay attention because you take it for granted that your body will continue to do its job.

Sometimes, when you're exposed to something rare, you gain insight with an epiphany about the obvious and everyday. I first became interested in exploring the slowdown in metabolism and hormone production by studying human beings in overdrive, growth happening at warp speed. In 1970 I was conducting research at the National Institutes of Health (NIH) on young boys and girls who were growing up too fast, a condition known as precocious puberty or early adolescence. I was introduced to children who, at age 3 and younger, were having erections and developing biceps. These boys were bigger, stronger, visibly different from their classmates. At age 4 or 5, they had the musculature of a 10-year-old. By the time they reached their 7th or 8th birthday, they looked like teenagers. Parents worried about interactions in the classroom and on the playground. Their sons and daughters were being deprived of their childhoods.

My colleagues and I used GnRH to reverse this biological injustice, giving them time to grow up at a more normal pace. Once we controlled the children's hormone production and put the brakes on their accelerated development, I saw these "adolescents in disguise" turn back into children. It was remarkable. I thought: *We're witnessing maturation and aging in a contracted period of time. We helped these children by altering their production of hormones and slowing their unnaturally rapid development—what if we could prevent or even reverse the process of aging with a similar approach?*

My years of clinical experience since this research on precocious puberty have proven to me that the negative feedback loop—involving the players GnRH, LH, and testosterone—is of critical importance at all stages of life. As you move past your peak reproductive period, usually somewhere between 25 and 30, remember that testosterone production is reduced by 1 to 3 percent each year. The brain *isn't* reacting to those lower T levels by ramping up production of GnRH and LH. Levels of all three hormones are in gradual decline, and this impacts your whole body. Cells in the testes that produce testosterone may be localized; however, they're acting globally. For instance, if you recall, the heart muscle has a significant number of testosterone receptors. If less testosterone is being messengered around the body, there is not enough to bind to the receptors in the organs, like the heart and brain, and perform its intended function. Those receptors become less responsive, or lose receptor binding sites. Without sufficient testosterone levels, you may not regain your strength, and you may be at risk for cardiovascular disease. Your workouts are less effective, and recovery takes longer. But

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