



Feel Incredible,
Avoid Disease,
and Age Well

“A tour de force.”
—Mark Hyman, MD

GOOD ENERGY

**The Surprising Connection Between
Metabolism and Limitless Health**

CASEY MEANS, MD

WITH CALLEY MEANS

Praise for *Good Energy*

“A tour de force on how metabolism underpins most major diseases and what we can do to feel better and live longer. Everyone will benefit from reading *Good Energy*.”

—**Mark Hyman, MD, author of the #1 *New York Times* bestselling *Young Forever***

“In *Good Energy*, Dr. Means makes a bold case for why food—and particularly regenerative agriculture—must be at the very center of health care. Dr. Means makes it clear that we can’t drug our way out of a broken food system.”

—**Will Harris, regenerative agriculture leader and owner of White Oak Pastures**

“In *Good Energy*, Casey and Calley Means powerfully explain how we can use metabolic health tools and strategies to support our own health and that of our children and families.”

—**Kelly LeVeque, nutritionist and author of *Body Love***

“*Good Energy* should be required reading for every medical student and healthcare practitioner. As a system and as individuals, we must adopt a metabolic, mitochondria-focused lens for health and vitality. Autoimmunity—along with many other chronic illnesses—is closely tied to metabolic dysfunction and insulin resistance. Foundational to better energy and health outcomes is getting metabolic health and blood sugar under control. Dr. Means shows readers how.”

—**Terry Wahls, MD, author of *The Wahls Protocol***

“Dr. Casey Means brilliantly illuminates the pivotal role of disturbed metabolism in setting the stage for chronic degenerative diseases, and

offers a comprehensive road map for enhancing and maintaining metabolic health. This book is a must-read for health care professionals and individuals alike who are seeking to understand and improve their overall health. With her insightful and loving guidance, Dr. Means is handing us the keys to the kingdom for prolonging our health span, making this book a game-changing, invaluable resource in our journey toward lasting wellness.”

—David Perlmutter, MD, author of the #1 *New York Times* bestselling *Grain Brain* and *Drop Acid*

“There’s no life without energy. Our mitochondria know how to capture chemical energy and optimize it. But what if our cells are poisoned? Think cyanide; think heavy metals. Now think alcohol, sugar, trans fats, all the environmental toxins that inhibit your mitochondria from their capacity. Dr. Casey Means brings the problem of cellular energy front and center to explain what’s really wrong in chronic disease, why medicines won’t fix it, why she walked away from a promising surgical career, how to remake our entire health and health care paradigm to save lives and money, and who’s blocking it. Part memoir, part manifesto, this book proves there isn’t another voice in the zeitgeist as cogent, urgent, and powerful as Casey’s. The gauntlet’s been thrown down—consider yourself warned.”

—Robert H. Lustig, MD, author of *Metaboficial* and professor emeritus of pediatrics, UCSF

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Casey Means, MD
with Calley Means

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For Gayle Means

Born 1949, died 2021 of pancreatic cancer (a preventable metabolic condition)

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INTRODUCTION

Everything Is Connected

I weighed eleven pounds, nine ounces at birth. My mom's doctors congratulated her for producing one of the largest babies in the hospital's history.

My mom had trouble losing the baby weight and continued to battle her weight for years after. Her primary care doctor told her this was normal. She just had a baby and was getting older, after all. They told her to "eat healthier."

In her forties, her cardiologist diagnosed her with elevated blood pressure. The doctor said this was very common for women her age and prescribed an angiotensin-converting enzyme (ACE) inhibitor to help relax her arteries.

In her fifties, her internal medicine doctor informed her she had high cholesterol (or more technically, high triglycerides, low HDL, and high LDL cholesterol). She was prescribed a statin and told this was almost a rite of passage for a person her age: statins are one of the most prescribed drugs in U.S. history, with over 221 million prescriptions doled out annually.

In her sixties, her endocrinologist said she had developed prediabetes. The doctor stressed that this, too, was very common and not of much concern. It's a "pre-disease," after all, right—and one that 50 percent of American adults qualify for. She left the office with her prescription of metformin, a drug that is prescribed over 90 million times per year in the United States.

In January 2021, when my mom was seventy-one years old, she was taking her daily hike with my dad near their home in Northern California. Suddenly, she felt a deep pain in her belly and experienced uncharacteristic fatigue. Concerned, she visited her primary care doctor, who conducted a CT scan and ran lab work.

One day later, she received a text message with her results: stage 4 pancreatic cancer.

Thirteen days later, she was dead.

Her oncologists at Stanford Hospital called her pancreatic cancer “unlucky.” My mom—who at the time of her cancer diagnosis was seeing *five separate specialists* prescribing *five separate medications*—was frequently complimented by her doctors in the decade running up to her diagnosis for being “healthy” compared to most women her age. And, statistically, she was: the average American over sixty-five sees twenty-eight doctors in their lifetime. Fourteen prescriptions are written per American per year.

Obviously, something isn’t right when it comes to the health trends of our children, our parents, and ourselves.

Among teens, 18 percent have fatty liver disease, close to 30 percent are prediabetic, and more than 40 percent are overweight or obese. Fifty years ago, pediatricians might go an entire career without seeing these conditions among their patients. Today, young adults exist in a culture where conditions such as obesity, acne, fatigue, depression, infertility, high cholesterol, or prediabetes are common.

Six out of ten adults are living with a chronic illness. About 50 percent of Americans will deal with mental illness sometime in life. Seventy-four percent of adults are overweight or have obesity. Rates of cancer, heart disease, kidney disease, upper respiratory infections, and autoimmune conditions are all going up at the exact time we are spending more and more to treat them. In the face of these trends, American life expectancy has been declining for the most sustained period since 1860.

We are convinced these increasing rates of conditions—both mental and physical—are part of being human. And we are told we can treat the increasing rates of chronic conditions with “innovations” from modern medicine. In the decades leading up to my mom’s cancer diagnosis, she was informed her rising cholesterol, waistline, fasting glucose, and blood pressure levels were conditions that she could “manage” for life with a pill.

But instead of isolated conditions, all of the symptoms my mom experienced leading to her death were warning signs of the same thing: dysregulation in how her cells were producing and using energy. Even my enormous size at birth—which medically fit the criteria for fetal macrosomia (literally “big-bodied baby”)—was a robust indicator of energy dysfunction in her cells and almost certainly a sign of undiagnosed gestational diabetes.

But through decades of symptoms, my mom—and most other adults in the modern world—are simply prescribed pills and not set on a path of curiosity about how these conditions are connected and how the root cause can be reversed.

There is a better way, and it starts with understanding that the biggest lie in health care is that the root cause of why we’re getting sicker, heavier, more depressed, and more infertile is complicated.

This sounds radical until you realize that virtually no animals in the wild suffer from widespread chronic disease. There aren’t rampant obesity, heart disease, or type 2 diabetes rates among lions or giraffes. But preventable lifestyle conditions are responsible for 80 percent of modern human deaths.

Depression, anxiety, acne, infertility, insomnia, heart disease, erectile dysfunction, type 2 diabetes, Alzheimer’s disease, cancer, and most other conditions that torture and shorten our lives are actually rooted in the *same thing*. And the ability to prevent and reverse these conditions—and feel incredible *today*—is under your control and simpler than you think.

Good Energy

I want to share a vision of health that is big and bold. It predicates health and longevity on something simple, powerful, and absolutely fundamental. A single physiological phenomenon that can change almost everything about how you feel and function today and in the future. It's called Good Energy, and the reason it has such a life-changing impact is that it governs the very essence of what (quite literally) makes you tick: whether your cells have the energy to do their jobs of keeping you nourished, clear-minded, hormonally balanced, immune protected, heart-healthy, structurally sound—and so much more. Having Good Energy is the core underlying physiological function that, more than any other process in your body, determines your predilection to great mental and physical health or to poor health and disease.

Good Energy is also known as metabolic health. Metabolism refers to the set of cellular mechanisms that transform food into energy that can power every single cell in the body. You might not have thought much about whether you have Good Energy or not. When cellular energy production is working well, you don't have to "think" about it or be conscious of it. It just is. Your body has an exquisite set of mechanisms that make Good Energy happen every second of every day; these cellular mechanisms create sustained and balanced energy, distribute it to every cell in your body, and clean up the residues from the process that would otherwise clog up the system.

When you hold the keys to this one critical bodily process, you can be an outlier—a truly positive kind of outlier. You can feel vital and enlivened and function with clarity of mind. You can enjoy balanced weight, a pain-free body, healthy skin, and a stable mood. If you're of childbearing age and hoping to have kids, you can enjoy

the natural state of fertility that is your birthright. If you're getting older, you can live relieved of the nagging anxiety that precipitous physical or mental decline awaits you or that you'll develop a disease that "runs in the family."

When you lose the keys to Good Energy, however, so much starts to go wrong. Organs, tissues, and glands are, after all, mere collections of cells. Lose the capacity for properly and safely powering those cells and—no real surprise—the organs made up of them start to struggle and fail. This means that just about any disease can arise as a result—and today, given the pressures that Good Energy is under, that's exactly what is occurring.

The problem, simply stated, is a mismatch. The metabolic processes that run our bodies evolved over hundreds of thousands of years in a synergistic relationship with the environment around us. But those environmental conditions around the cells of our bodies have profoundly and rapidly changed in recent decades. Starting with our diet, yet including our movement patterns, our sleep patterns, our stress levels, and exposure to nonnatural chemicals, things are not as they once were. The environment for the cells of the average modern human is now radically different from what the cells expect and need. This evolutionary mismatch is tipping normal metabolic function into dysfunction: Bad Energy. And when small cellular disturbances happen in every cell, at every moment, the effect is outsized—rippling up into the tissues, organs, and systems of your body and negatively influencing how you feel, think, function, look, age, and even how well you combat pathogens and avoid chronic disease. In fact, almost every chronic health symptom that Western medicine addresses is the result of our cells being beleaguered by how we've come to live. It's a terrible trickle-up: Bad Energy leads to broken cells, broken organs, broken bodies, and the pain you feel.

We have two hundred different types of cells in the human body, and when Bad Energy shows up in different cell types, different

symptoms can arise. For instance, if an ovarian theca cell is experiencing Bad Energy, it looks like infertility in the form of polycystic ovary syndrome (PCOS). If a blood vessel–lining cell is experiencing Bad Energy, it can look like erectile dysfunction, heart disease, high blood pressure, retinal problems, or chronic kidney disease (all issues resulting from poor blood flow to different organs). If a liver cell is experiencing Bad Energy, it can look like nonalcoholic fatty liver disease (NAFLD). In the brain, Bad Energy can look like depression, stroke, dementia, migraine, or chronic pain, depending on where these dysfunctional cellular processes are most prominently showing up. Recently, research has clearly shown us that every one of these conditions—and dozens more—is linked directly to metabolic issues, a problem with how our cells make energy: Bad Energy. The way we practice medicine, however, has not caught up with this root-cause understanding. We still “treat” the *organ-specific results* of the Bad Energy, *not* the Bad Energy itself. And we will never improve the failing health of our modern population if we don’t address the correct issue (metabolic dysfunction), which is why the more we spend on health care, and the more we work as physicians, and the more access to health care and medications we provide to patients, the worse the outcomes get.

Compared to one hundred years ago, we are consuming astronomically more sugar (i.e., up to 3,000 percent more liquid fructose), working in more sedentary jobs, and sleeping 25 percent less. We’re also exposed to over eighty thousand synthetic chemicals in our food, water, and air. As a result of all these factors and many others, our cells have stopped being able to make energy the way they should. Many aspects of our industrialized life over the past century share a unique and *synergistic* ability to attack the machinery inside the cells that produce chemical energy. The result: cellular dysfunction throughout our bodies, showing up as the explosion of chronic symptoms and diseases we are facing today.

Our body has simple ways to show us whether we have brewing metabolic dysfunction: increasing waist size, suboptimal cholesterol levels, high fasting glucose, and elevated blood pressure. My mom experienced all of them, and 93 percent of Americans are in the danger zone on at least one key metabolic marker.

Aside from some significant excess belly fat, my mom appeared healthy on the outside. She was vibrant, happy, and energetic, and actually looked years younger than her age. This is a funny thing about metabolic dysfunction: it doesn't necessarily show up everywhere all at once, and it can look very different in different individuals, based on which cell types show the manifestations most obviously.

Her case is only one example of something that is happening every day to millions of people and families. I am writing this book because her story is relevant to everyone. Disease isn't some random occurrence that might happen in the future. It is a result of the choices you make and how you feel today. If you are battling annoying and seemingly nonlethal health issues—like fatigue, brain fog, anxiety, arthritis, infertility, erectile dysfunction, or chronic pain—an underlying contributor to these conditions is generally the same thing that will lead to a “major” illness sometime later in life if nothing changes in how you care for your body. This information stings and can be scary, but it's crucial to convey: if you ignore the minor issues as signs of Bad Energy brewing inside your body today, you could get much louder signals in the future.

Waking Up

For most of my adult life, I was a vocal advocate for the modern health care system and collected credentials to rise within its ranks: a research internship at the National Institutes of Health (NIH) at age sixteen, president of my Stanford class at eighteen, best

undergraduate human biology thesis award at age twenty-one, top of my Stanford Medical School class at twenty-five, a surgical resident in ear, nose, and throat (ENT) surgery at Oregon Health & Science University (OHSU) by age twenty-six, and winner of ENT research awards at thirty. I had been published in premier medical journals, presented my research at national conferences, spent thousands of lonely nights studying, and was the pride of my family. It was my entire identity.

But five years into surgical residency, I met Sophia.

Recurrent sinus infections had plagued this fifty-two-year-old woman, leading to a persistent foul smell in her nose and difficulty breathing. Over the past year, her physicians had prescribed steroid nasal sprays, antibiotics, oral steroid medication, and medicated nasal rinses. She'd undergone CT scans, in-office nasal endoscopy procedures, and a nasal polyp biopsy. Her recurrent infections caused her to miss work and lose sleep, and she was overweight and had prediabetes. She had also been taking medication for high blood pressure and dealt with back pain and depression, which she attributed to her health issues and getting older. She saw a different doctor and received a separate treatment plan for each issue.

None of Sophia's sinus medications were successfully solving the problem, so she came to my department for surgery. In 2017, I was a young doctor starting my fifth and final year of surgery training.

After Sophia was wheeled into the operating room, I inserted a rigid camera into her nose and used a small instrument to break up the bones and swollen tissue and vacuum them out of the sinus passages just millimeters from her brain. In the postoperative area, the anesthesiologists struggled to control her blood sugar and blood pressure with an insulin drip and intravenous antihypertensives.

"You saved me," she said while grasping my hand after the procedure. But looking into her eyes after the surgery, I didn't feel proud. I felt defeated.

At best, I had relieved the downstream symptoms of her chronic nasal inflammation, but I had done absolutely nothing to cure the underlying dynamics causing that inflammation. I also did absolutely nothing to help with her other health conditions. I knew she would return with many other symptoms and continue going through the revolving doors of several specialists for her health issues that weren't my focus. Was she leaving this post-op area "healthy" after I'd permanently altered her nasal anatomy? What were the chances that the factors driving her prediabetes, excess fat, depression, and high blood pressure (all conditions that I knew had some relationship to inflammation) had absolutely *nothing* to do with the recurrent inflammation in her nose?

Sophia was my second sinusitis surgery of the *day*, the fifth of my week. I'd performed hundreds of these operations during residency on angry, inflamed sinus tissue. But so many patients kept returning to the hospital for follow-up sinus procedures and treatments for other diseases—with diabetes, depression, anxiety, cancer, heart disease, dementia, hypertension, and obesity among the most common.

Despite surgically treating inflamed tissues of the head and neck day in and day out, not once—*ever*—was I taught what *causes* the inflammation in the human body or about its connection to the inflammatory chronic diseases so many Americans are facing today. Not once was I prompted to ask, *Huh, why all the inflammation?* My gut told me that all of Sophia's conditions could be related, but instead of tapping into that curiosity, I always stayed in the lane of my specialty, followed the guidelines, and reached for my prescription pad and scalpel.

Soon after my encounter with Sophia, I felt an overwhelming conviction that I couldn't cut into another patient until I figured out why—despite the monumental size and scope of our health care system—the patients and people around me were sick in the first place.

I wanted to understand why so many conditions were rising exponentially and in clear patterns indicating potential connections. And most important, I needed to figure out whether there was anything I could do as a physician to keep my patients *out* of the operating room. I had become a doctor to generate foundational, vibrant health for my patients—not to drug, cut, and bill as many bodies as I possibly could each day.

It was increasingly becoming clear to me that although I was surrounded by practitioners who got into medicine to help patients, the reality is that every institution that impacts health—from medical schools to insurance companies to hospitals to pharma companies—makes money on “managing” disease, not curing patients. These incentives were clearly creating an invisible hand that was guiding good people into allowing bad outcomes.

Striving to reach the top of the medical field had been my laser-focused path. If I stopped operating on patients, I had no backup plan and half a million dollars had gone toward my education. At that time, I still couldn’t imagine what I’d do other than be a surgeon.

But these considerations all seemed so inconsequential compared to the one blaring fact I couldn’t get out of my head: **The patients aren’t getting better.**

In September 2018, on my thirty-first birthday and just months shy of completing my five-year residency, I walked into the chairman’s office at OHSU and quit. With a wall full of awards and honors for my clinical and research performance and with prominent hospital systems pursuing me for mid-six-figure faculty roles, I walked out of the hospital and embarked on a journey to understand the real reasons why people get sick and to figure out how to help patients restore and sustain their health.

The insights I learned on this quest couldn’t save my mom—her cancer had likely been growing quietly in her body long before I left conventional medical practice. I am writing this book because

millions of people can improve and extend their lives right now with simple principles doctors aren't taught in medical school.

I am also convinced our lack of understanding about the root cause of disease represents a larger spiritual crisis. We have become disconnected from the awe about our bodies and life, separated from the production of the foods we eat, made more sedentary by our work and school, and detached from our core biological needs, like sunlight, quality sleep, and clean water and air. This has put our bodies into a state of confusion and fear. Our cells are dysregulated at scale, which of course impacts our brains and bodies, which determine our perception of the world. The medical system has capitalized on this fear and offers "solutions" to symptoms of this dysfunction. That's why the medical system is the largest and fastest-growing industry in the United States. We are locked into a reductionist, fragmented view of the body that breaks us into dozens of separate parts. This view does not foster human flourishing. In reality, the body is an awe-inspiring and interconnected entity that is constantly regenerating and exchanging energy and matter with the external environment every time we eat, breathe, or bask in sunlight!

There is no question that the American medical system has produced miracles in the past 120 years, but we have lost our way when it comes to preventing and reversing metabolic conditions that account for over 80 percent of health care costs and deaths today. The situation is dire, but this is a book of optimism and practicality. The fact that we can vigorously criticize and reform our health care system is one of its strengths. Throughout prior crucible moments, human ingenuity has created advancements and systems changes that few could imagine. The next revolution in health will come from understanding how the root of almost every disease relates to energy, and how less specialization, rather than more, is the answer. We will see that our ailments are connected rather than siloed, a reality that research is only recently allowing us to see clearly, now

that we have tools and technology to truly understand what's happening inside our cells at the molecular level. And when we shift our framework to this energy-centric paradigm, we will rapidly heal our system and our bodies. Fortunately, improving Good Energy is easier and simpler than it seems—and you can take steps to prioritize it in your life. This book will show you how.

Part 1 explains the science of how our metabolism is at the root of disease and the incentives that lead our current system to ignore it. Part 2 provides mindsets and tactics you can start implementing to feel better today. Part 3 brings all of these concepts together into an actionable plan, and Part 4 presents thirty-three recipes that include Good Energy eating principles. Throughout the book, I'll use stories from my experience inside and outside the system and insights from metabolic health leaders.

Good Energy is the goal, and the state of mind—and what it can create—is incredible . . . a world where we are eating beautiful food, moving our bodies, interacting with nature, taking pleasure in the world around us, and feeling fulfilled, vibrant, and alive. The view is exciting, because living with Good Energy means good food, happy people, real connections, and expanding into the most beautiful expression of our precious lives.

It's true that the challenges we're up against on the quest for upleveling our health are enormous. Yet I have seen that all of this can start to change *right now*. It starts when you simply ask one question: What would it feel like to have Good Energy? I invite you to ask that question now: What would it feel like to have your body functioning optimally, for your body to just be at ease enjoying this human experience, for your mind to be working clearly and creatively, and to feel that your life is established on a steady and strong source of inner power? Imagine a powerful life force from within that allows you to take on each day with pleasure, energy, gratitude, and joy. Take a moment. Really feel it. Imagine it. Let yourself.

My hope for this book is to change your life by enabling you to feel better today and prevent disease tomorrow. It all begins by understanding and acting upon the science of Good Energy.

To view the scientific references cited in this chapter, please visit us online at caseymeans.com/goodenergy.