A Prescription for Restorative Health

Do you struggle with chronic illness, difficulty losing weight, sugar addiction, and feeling stressed and tired all of the time? Are you confused about what to eat and not to eat? Or know which factors contribute to your body becoming irritated and inflamed?

This is a revolutionary new look at why we are affected by inflammation and how to regain balance and learn to heal. Discover how you can become a newer, healthier, more vital you!

- Learn how to have more energy through a better diet.
- Learn the role of gut bacteria in your overall health.
- Learn the mind–body techniques to recharge and activate your body.
- Learn how even small amounts of movement can decrease chronic illness.

This knowledge is empowering! Your journey begins here.

"Super job! [discussing the microbiome and its nuances]"

ALESSIO FASANO, MD
Chief of Gastroenterology and Nutrition, Harvard/Mass. General Hospital for Children

"As a Paralympic athlete, I have learned what it takes to get to the top by eating right and staying healthy—taking care of my body is my #1 priority. Thanks to Dr. Rao and Dr. Aggarwal for their insights and advice."

TATYANA McFADDEN
15X World Champion, Grand Slam Marathon Champion, 3X gold medalist

"Drs. Monica Aggarwal and Jyoti Rao's book is the reference text for many decades of a life free of disease. They define in depth the essential components of nutrition, the microbiome, hydration, mental tranquility, sleep, exercise, and more. This book will guide you past each pivot point towards enduring wellness."

CALDWELL B. ESSELSTYN, JR, MD
author of the New York Times *best-seller* Prevent and Reverse Heart Disease

"A wonderful book! If you want to capture the best from your mind, follow this fantastic guide about how to treat your body."

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BODY ON FIRE

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HEALTHY LIVING PUBLICATIONS

MONICA AGGARWAL, MD
JYOTHI RAO, MD

BODY ON FIRE

How Inflammation Triggers Chronic Illness and the Tools We Have to Fight It

"…a useful resource for anyone interested in attaining better health"
FROM A FOREWORD BY ANDREW WEIL, MD

We are all affected in some way or another. It always takes a toll. It is for this reason that we, Dr. Aggarwal (a cardiologist) and Dr. Rao (an internist), have decided to write this book. We have been sick. We know what it feels like to be blindsided by illness, yet the signs were there all along. We just weren't looking. As physicians, we started to look for answers first in our pills. When the pills left us with nasty side effects and incomplete healing, we started on a journey to understand why the body gets sick and what we can do to heal it—truly heal it. Over the years, we have learned together that there is so much we can do to put our bodies back in balance. There are so many options for treatments, beyond our pills, to heal our bodies and decrease our inflammation. We have written this book to educate you, to offer you hope for options for healing and to empower you with the knowledge and tools to identify your fires and extinguish them.

Healing is not a simple task . . . but it is a worthwhile one. As physicians, we stand by the medicines that we prescribe, but we offer here additional prescriptions that don't come in pill form. These are prescriptions that complement our medications and sometimes, if we are lucky, allow us to stop taking our pills. It happened for us, and it happens for so many of our patients. Here, in these chapters, we give you a comprehensive and detailed study and present as much data as is available on these matters. The reality, however, is that much of the data out there is not the desired randomized control trial. There are few studies that will compare diet with pills because of the worry of withholding therapy and because there is a significant lack of funding. Often, studies are funded by pharmaceutical companies. Pharmaceutical companies want trials, because if there are positive associations between illness and the medication they prescribe, we physicians will prescribe that medication and pharmaceutical companies will make more money. The problem is that the prescriptions in this book aren't pills. Companies have no incentives to offer solutions that don't include drugs.

Therefore, we present as much data as we could find and as many anecdotes as we could, and you can make your own judgments. These

tools can and should be used with a standard medical treatment plan. Consider how little you have to lose by trying these prescriptions and how much you could possibly gain. We are not prescribing dangerous changes. You will suffer no medication side effects if you follow our advice. What do you have to lose by trying? These prescriptions changed our lives by extinguishing our fires. We hope they will change yours too. We want you to be empowered to change, to heal, to balance. Come with us on this journey. Welcome to the new and healthier you!

As you read through this book, we ask you to consider how you feel. See table 1 where we have listed questions for you to ask yourself. If you answer "yes" to any of these questions, we hope you will take the time to read this book.

TABLE 1: HOW DO I FEEL?

ENERGY

- ☑ Do I feel as if I don't have the energy to do the things I want to do daily?
- ☑ Do I feel tired when I wake up in the morning?
- ☑ Do I feel as if I need a nap during the day, such as right after lunch?
- ☑ Am I in pain when I wake up, or do I feel pain throughout the day?

LIFESTYLE

- ☑ Is it hard to find the energy to exercise?
- ☑ Am I frustrated with my weight?
- ☑ Do I feel like I am taking too many pills?
- ☑ Do I feel like I need more sleep?

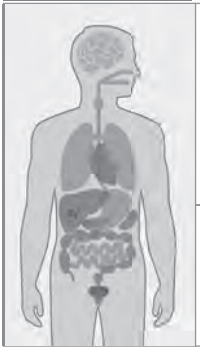
FOOD

- ☑ How do I feel after eating my food? Do I get tired? Does my pain get worse?
- ☑ Are my meals healthy? What does that look like? Does my food come in a frozen box? Do I cook or mainly microwave?
- ☑ I really don't eat anything, but do I feel like I continue to gain weight?
- ☑ Do I feel constipated? Do I only go to the bathroom every few days?
- ☑ Do I crave sweets all of the time?

MIND

- ☑ I've had bad habits my whole life. Can I still change?
- ☑ Do I feel anxious all of the time?
- ☑ Do I have difficulty with my memory? Do I forget where I park my car?
- ☑ Do I have trouble falling asleep at night because my mind is always moving?

FIGURE 1 What are the Microbiota and Microbiome?



MICROBIOTA

Microorganisms (tiny bugs) in our bodies that are exposed to the outside surfaces. These include the gastro-intestinal organs (mouth to anus), skin, nose, ears and genitals.

MICROBIOME

Entire gene pool found in our bodies, so it includes the DNA (the brains) of every bug in our gut.

Microbiota is the term that refers to all of the microorganisms (tiny bugs) in our bodies that are exposed to the outside surfaces. This includes the gastrointestinal organs (mouth to anus), skin, nose, ears, and genitals. These microorganisms are bacteria, protozoa, fungi, and even viruses that inhabit our bodies. It is estimated that 90 percent of cells (approximately 100 trillion cells) found in our bodies are not human, but come from 40,000 bacterial strains. Imagine, then, that we are only 10 percent human and the remainder is bugs!

Microbiome refers to the entire gene pool found in our bodies. Recall that *genes* are the instructions in cells that decide our appearances, what our personalities are like, and what health conditions we will get in our lives. Genetic material lives in all of our cells and is called our genome. There is also genetic material that comes from every bug in our guts. Some people call the gut our "second genome" or our "second brain" because of all the genetic material that comes from our bugs. Not only are the human genes outnumbered by the genetic material from our microbiota, but these gut bugs likely have a significant impact on our health as well.

The human microbiome project is a project funded by the National Institutes of Health. The project focuses on understanding the role of the microbiome in our bodies. It has given us a lot of important information on the role of the gut in how we feel and how we respond to illness. From this project, we know that the microbiota plays a critical role in building and maintaining our immune systems. Many people call the gut the "internal health monitor." It is responsible for moni-

toring bacteria and viruses that come into the mouth with everything we eat and preventing those infections from getting into our bloodstreams and becoming systemic diseases. The gut is involved in the production of vitamins, essential amino acids, and fatty acids. It also impacts how our bodies utilize fats and sugars, which are important in understanding how we gain weight.[1] (See Consider 1.)

CONSIDER 1

☑ How does my gut bacteria contribute to my risk of illness or my risk of weight gain?

Having an intact microbiota directly impacts one's health. Similarly, having a weakened microbiota puts one's body at risk for illness. The proliferation of the wrong kind of microbiota may predispose us to autoimmune diseases, such as inflammatory bowel disease and type 1 diabetes, as well as increasing risk of obesity, infections, and depression. It also likely impacts our risk for getting allergies.[2] These microbial communities change as we age, and the type of bacteria that are present in these communities shift, based on our diets and exposures to various foods and antibiotics, which can lead to an over- or underproduction of certain microbes. Many of us believe that this second genome plays a crucial role in deciding how healthy, or how sick, we will be.

How Is the Microbiome Created?

When we are born, we go through our mothers' vaginal canals (the birth canal) and are exposed to our mothers' microbiomes. We know that when a baby is born by vaginal delivery, the bugs from the mom's vagina populate the baby's gut. We also know that if a baby is born via cesarean section, the bugs from the mom's skin populate the baby's gut. We know that the composition of the gut bugs change based on if the baby is breastfed or formula fed, whether the baby received rice cereal or was given antibiotics for an infection.[3,4] Babies then crawl on the floor and suck on their toys. They are exposed to other people, our pets, and our plants, all of which are covered in

satiety faster than high-glycemic foods and with less drastic boosts in blood sugar levels.

It is not only a food's ranking on the glycemic index that's important, though. Food in its natural form provides a lot of fiber. Beans are carbohydrates but are full of fiber and water, so they take longer to break down. Because they take time to break down, they don't cause the quick highs and lows that foods high in simple sugars, such as refined breads and sodas, can cause; they steadily break down over time. These complex carbohydrates give us a measured amount of energy at all times. It gets a little confusing when we look at pasta. Pasta is a low-glycemic food, which is good, but it has minimal fiber. On the other hand, it is better than eating candy and cookies, which have a high glycemic index without any fiber and, therefore, are processed moderately quickly. Pasta is good and filling but doesn't have the fiber we need.

While fruits are considered simple carbohydrates because they are primarily sugar, but they are good for us because they also provide us with fiber and nutrients. As you can see, not all simple carbohydrates are a problem. It is what we do to the foods, the processing, that is problematic. When we process them, they become simple, their glycemic index increases, and they lose their fiber: two negatives. Studies show that increased fiber is associated with decreased heart disease.[14] Studies also show that whole grains are better than simple or refined grains.[15]

The foundational complex carbohydrates are legumes, which come from plants. They have a low glycemic index and are high in fiber. (See figure 2 on the next page.) Examples of legumes are alfalfa, clover, lentils, peas (green peas and chickpeas), beans, carob, soybeans, peanuts, and tamarind. Beans of any kind are excellent food choices. Consider kidney beans, black beans, navy beans, and pinto beans; they are all amazing! There are so many vital ingredients in these legumes. They are rich in protein and high in potassium. Many contain a significant amount of magnesium and iron. Some legumes also provide a little calcium, but not a significant amount.

Legumes also contain resistant starches. When resistant starches reach the colon, they ferment and form short-chain fatty acids, such as butyrate. Butyrate is a short chain fatty acid, and its production appears to be important in maintaining colonic health and lowering

FIGURE 2 A Legumes Sampler

Legumes are low glycemic and high in fiber, resistant starches

our risk of chronic illness. Research suggests that butyrate also is vital in lowering insulin resistance, risk of stroke, and high cholesterol. It also appears related to a diminished risk of cancer.[16] Legumes are truly amazing foods!

Caloric Density

Another way to look at foods is based on their caloric density. Jeff Novick at the McDougall Center in Santa Rosa, California, is a huge proponent of this approach to food. Think of caloric density as the amount of calories per ounce of food. Water and fiber in food will lower its calorie density, while fat and oil increase it. Studies show that overall, people eat about the same amount of food every day, but

FIGURE 1 It's All in a Glass of Water

WATER IS AN INTEGRAL PART OF OUR BODY'S OPERATION

Less then an adequate daily amount can result in weight gain, low energy, heart palpitations, constipation, headaches and even depression.

Every day, our bodies lose water through respiration (think of your foggy breath on a cold winter day), urination, sweating, and fecal material, resulting in approximately 2.4 liters (just over 80 ounces) of water lost each and every day. Losses are then balanced by what we take in. We obtain our fluids from what we drink and the liquid in our food. Drinking water is the easiest way to hydrate our bodies. Eating water-rich fruits and vegetables is also a great way to keep hydrated.

When the brain detects that we lack water, it activates our thirst mechanism. If we don't quench our thirst, not only does our urine become dark in color, but our stools also become hard, and we become constipated. Without fluids, some people feel faint and lightheaded. Others get headaches. With persistent dehydration, the kidneys start failing. People can develop palpitations (heart flutters), which resolve with fluid intake. We use hydration to maintain blood pressure.

A dehydrated body is a stressed body, and stress is a major source of disease. A healthy body can live for several weeks without food, but it cannot survive more than several days without water. Severe

dehydration for an extended time can kill you. Many people do not understand that coffee, sodas, juices, and many energy drinks have a dehydrating effect on the body and do not replenish our bodies. Sodas, tea, coffee, and juices are also not good options for hydration because they have so many other ingredients. The sugars in juice and caffeine in tea cause us to urinate without actually hydrating us. Most people simply do not consume enough water or foods with a high water content.

Dehydration also can contribute to weight gain and obesity. People often confuse dehydration with hunger. Often, when we feel our stomachs rumbling, we reach for food when, in fact, we are simply thirsty and need to drink some water. People also choose to consume high-caloric drinks, such as sodas, fruit juices, and energy drinks, instead of water, adding to weight gain. Our metabolisms will actually slow down when we are dehydrated, thus we will burn fewer calories, again raising the potential for weight gain.[1] (See Consider 1.)

CONSIDER 1

- ☑ When you're hungry, try drinking a glass of water before you start eating something.
- ☑ People can confuse dehydration with hunger; drinking a glass of water can dissipate our desire to eat.

Many of our clients are successful in changing their food choices, and they start losing unwanted weight. Drinking more water, especially before a meal, helps increase weight loss. (See Consider 2.)

CONSIDER 2

Coffee, sodas, juices, and energy drinks have a dehydrating effect on the body.

1. What percent of your daily liquid intake is actually water versus other beverages?
2. Try tracking the number of glasses of water you drink in one day. Note: a glass holds almost two cups of water. *Some experts believe you should drink eight cups (64 ounces) of water per day.*

keep our systems activated for up to eight hours and prevent us from calming down enough to sleep. Nicotine from cigarettes also can keep us activated late into the night. (See Consider 3.)

CONSIDER 3

- ☑ Do you have trouble sleeping at night?
- ☑ Do you take in any stimulants, such as tea, coffee, or chocolate, in the afternoon?

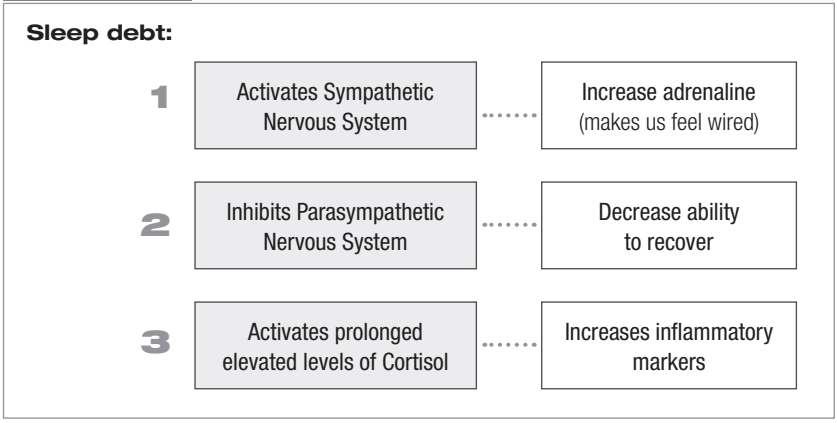
Sleep and Our Stress Hormones—The Link Between Stress and Cortisol

Earlier we mentioned that cortisol levels should be highest in the morning and decrease throughout the day. During the evening, we have higher levels of adenosine and melatonin, which help us sleep. Sleep deprivation has a major impact on stress hormone regulation through two pathways: activity at the brain level and through the autonomic nervous system (the nervous system in charge of our stress response).

The pituitary gland is considered the master endocrine gland and controls secretion of several hormones. During normal sleep patterns, growth hormone is released, emphasizing the need for better sleep in order to grow. Normally, while we sleep, cortisol production is decreased. When sleep deprivation occurs, however, it causes a stress response, and the sympathetic nervous system (fight or flight) is activated.[3] Our adrenaline increases, and we are ready to get moving. With chronic sleep deprivation, our hormone balance is disrupted. One study illustrates this concept. It looked at eleven men who slept four to six hours per night and noted that those with this sleep debt had higher evening cortisol levels and higher activation of the sympathetic nervous system than their counterparts who slept more.[3]

Sleep debt, then, is a distress to our bodies (see pages 17–21) similar to chronic stress. We see increases in our inflammatory markers with sleep debt as well (tumor necrosis factor and Interleukin 6).[5] These markers are part of the immune system defense, and they respond to enemies such as viral infections and tumors. They help the body fight foreign cells by creating symptoms, such as a fever, and recruit-

FIGURE 2 The Stress of not Sleeping—Cortisol and Sleep Debt



ing other fighter cells into the areas where there is inflammation—*a good thing*. However, in the presence of chronic inflammation from persistent sleep loss, these markers can be persistently elevated and cause symptoms of fatigue and sluggishness—*a bad thing*. (See figure 2 and Consider 4.)

CONSIDER 4

☑ Consider how much faster you recover from a cold or virus when you give yourself enough time to sleep.

Sleep as an Antioxidant

Another very important aspect of sleep is its antioxidant potential. In order for the body to work, it needs oxygen. However, the use of oxygen in cellular reactions can generate free radicals, which make our cells unstable and cause damage to our DNA. Consequently, this can lead to chronic illness, including creating a focal point for cancer-causing cells. Multiple triggers for this free radical formation have been discussed in previous chapters. Antioxidants are needed to protect our cells against damage from this oxidative stress. Sleep deprivation adversely affects the immune system, creates even higher oxidative stress, and in turn contributes to even more metabolic imbalances.[6,7] In contrast, sleep is restorative and serves as an antioxidant.

poor. Many think optimism is genetic, that you are born with a fixed outlook. You either have it or you don't. People often say, "Well, this is just how I was born" or "I can't change how I feel." But research shows that although there is a genetic component, optimism can also be cultivated, grown, and expanded.[1]

Can Optimism Improve Health?

A meta-analysis of 83 studies showed optimism, as well as reduced rates of depression and heart disease, were associated with improved health outcomes in cancer and pregnancy.[1,2,3] Optimists are found to be more resilient to stress, and newer research suggests a link between optimism and increased lifespan![4,5]

A potential reason for these improvements is that optimists make better lifestyle choices—they eat better and exercise more, they have more coping strategies to get through times of hardship, and they have more problem-solving capability to overcome adversity. All this information compels us to find ways to increase our optimism and make it another valuable tool for health! Let's look deeper at this.

How Do We Become Optimists?

You may be thinking, "Well, this is all well and good. But wanting to have positive emotions and social connectedness is one thing. Actually, having them is totally another." So how do we work on these positive thoughts? How do we improve optimism? In his book *Learned Optimism*, Martin Seligman, PhD, a pioneer in the field of positive psychology, gives many pointers to help us become more optimistic. He discusses practical exercises to decrease negative self-talk and challenges the way we view negative thoughts and beliefs. He teaches us to cultivate gratitude and positive emotions by actively shifting our minds from looking at the negative to finding the positive in any situation.

CONSIDER 1

- ☑ Self-talk is that voice in our head that is always criticizing us. Can we learn to make that voice go away?