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HEALTH *for the* 21ST CENTURY



EBOOK

9 Steps to Perfect Health

by CHRIS KRESSER



Introduction

We live in extraordinary times. Human ingenuity has given us flight, space travel, lasers, the internet, and amazing medical technologies that can help the deaf hear and the blind see. We're able to reattach limbs, transplant organs, and we're even not far away from being able to grow new human tissue in a lab.

Yet despite these considerable advances, we're sicker and fatter than ever before. Consider the following:

- Excess weight now accounts for one in three deaths among middle aged people in the US each year.
- A billion people around the world suffer from diabetes and obesity.
- 600 thousand people die of heart attacks in the US each year.
- One-third of Americans suffer from high blood pressure, which contributes to almost 800 thousand strokes every year.
- 50 million people in the US—one in six Americans—suffer from autoimmune diseases like Hashimoto's, rheumatoid arthritis, multiple sclerosis, and Crohn's disease.
- Depression is now the leading cause of disability, affecting more than 120 million people worldwide.

Unfortunately, there's every indication that things are going to get worse before they get better. This is the first generation of American children that are expected to live shorter lifespans than their parents. If current trends continue, 95 percent of Americans are expected to be overweight or obese within two decades, and one in three will suffer from diabetes.

The consequences of this modern disease epidemic are profound. In addition to making us miserable, it has brought our economy to its knees. In the US, the cost of treating diabetes alone is estimated at \$250 billion a year. To put this in perspective, the U.N. has estimated that the cost of ending world hunger would be \$200 billion—less than we spend treating a completely preventable disease each year.

If this sounds bleak, it is.

Now imagine, for a moment, a world where:

- Modern, chronic diseases like diabetes, obesity, autoimmune disorders, allergies, asthma, and cardiovascular disease are rare or nonexistent.
- Everyone is naturally lean and fit.
- We age gracefully with strong bones, sharp minds, and normal blood pressure.

This might sound like pure fantasy today. After all, chronic illness has become so common it's almost impossible to imagine life without it.

But there's a big difference between what's common, and what's normal.

Let me say that again:

There's a big difference between what's common, and what's normal.

Chronic illness is common—but it's definitely not normal. How do we know this?

Our species evolved roughly two million years ago and for 99.5 percent of that time, humans were free of the modern diseases that today kill millions of people each year and make countless others miserable. No obesity. No diabetes. No heart disease. No allergies, asthma, or autoimmune disease.

Some have argued that our hunter-gatherer ancestors didn't get these diseases because they didn't live long enough to get them. But while it's true that hunter-gatherers have

shorter *average* lifespans than ours, this was mostly because of extremely high rates of infant and adolescent mortality.

Life was challenging for hunter-gatherers in ways that most of us no longer experience. They suffered from high rates of violence due to tribal warfare, lived outdoors, and had no modern medical care whatsoever.

But when hunter-gatherers escaped these challenges and survived childhood and adolescence, they had lifespans roughly equivalent to our own, often living well into their 70s. The difference is, they reached these ages without acquiring any of the chronic, inflammatory diseases that are destroying our quality of life.

It's been a long time since we lived as hunter-gatherers. But our health has even changed dramatically in the past 100 years. At the turn of the 20th century, heart disease was still relatively unknown even in the industrialized world. Obesity and diabetes were likewise rare. Our grandparents did not suffer from allergies, asthma, food intolerances, and the dizzying array of behavioral problems like ADHD and autism spectrum disorders that plague our children today.

So what happened? In a word, mismatch.

All organisms are adapted to survive and thrive in a particular environment. And when that environment changes faster than the organism can adapt, mismatch occurs. This is a fundamental principle of evolutionary biology, and it applies to humans as much as it applies to any other organism in nature.

We've known for some time that animals living in zoos are less healthy and have shorter lifespans than their counterparts living in the wild. Why? Because their environment (i.e. diet and lifestyle) in the zoo is so dramatically different than the environment they evolved in. Fortunately, many zoos have recognized this and have begun to transition the animals back to their native diet and lifestyle (as much as is possible in a zoo) in order to improve their health.

In many respects, modern civilization has become the equivalent of animals living in captivity. You could say we're living in a human zoo—because our life is almost unrecognizably different from the lives of our ancestors.

For 66 thousand generations—roughly 2 million years—humans ate mostly meat, fish, fruits, vegetables, nuts, seeds, and some starchy tubers. We were physically active throughout the day, we didn't sit for long periods, and we lived in sync with the natural rhythms of light and dark, in direct contact with nature, in tight-knit tribal, social groups.

Today, Americans get more than 50 percent of daily calories from processed foods like flour, sugar and industrial seed oils that are virtually devoid of nutrients. We sit for long hours at work, and increasingly sit during our leisure time—watching TV, browsing the internet, or playing video games. We're sleep deprived; one-third of Americans now get fewer than 6 hours of sleep a night, despite a mountain of evidence indicating that most of us need 7–8 hours to function properly. And we're chronically stressed. Americans are working an average of 12–13 hours more per week than we were 50 years ago. Even when we do manage to get away, we rarely unplug. 64 percent of workers check their work-related email on vacation.

It follows, then, that the fastest way to recover our natural health and vitality is to return to a way of eating and living that more closely matches what our genes and biology are designed for.

That's exactly what I'm going to show you how to do in this eBook—in 9 simple, yet powerful, steps. They are:

1. Eat real food.
2. Nourish your body.
3. Think quality, not quantity.
4. Heal your gut.
5. Move like your ancestors.
6. Sleep more deeply.
7. Manage your stress.
8. Supplement wisely.
9. Practice pleasure.

We'll cover these in much more detail in a moment. But before we do that, let me tell you why they are so important.


How the 9 Steps can save your life

One of the most glaring mistakes conventional medicine makes is to assume that modern diseases—diabetes, heart disease, depression, autoimmune disease, etc.—are unrelated conditions that don't share a common cause. This is a convenient fiction created by the pharmaceutical industry (and perpetuated by the medical establishment) to sell more drugs.

The truth is that while these conditions do have unique features, they all share a common origin: the modern lifestyle. Poor diet, nutrient deficiencies, stress, lack of sleep, lack of exercise, too much sitting, and environmental toxins all directly contribute to the problems that are ruining our health.

The conventional approach is to treat each of these various problems with different drugs, and ignore the fundamental factors that are at the root of all of them. That has been a stupendously unsuccessful approach. It's time to replace it with a more holistic view of health, and to empower ourselves to prevent and treat disease without unnecessary drugs or surgery.

This is the promise of the 9 Steps: to take control of your own health; to free yourself of the seemingly endless cycle of drugs, surgery, visits to doctor's offices and hospitals; and to discover a natural vitality and happiness that you may have never even known you possessed.



STEP 1:

Eat Real Food

The introduction of industrial food processing has without a doubt had the most detrimental effect on our health of any other factor in the last few hundred years—and possibly in the entire history of humankind.

Food refining has brought us all three of the harmful foods that are destroying our health: flour, sugar, and industrial seed oils. It has also brought us chemical additives and preservatives, some with known negative effects and others with effects still unknown.

New research is revealing the harm these newfangled processed foods have on us almost every day. For example, emulsifiers used in packaged foods ranging from mayonnaise to bread to ice cream have been shown to increase intestinal permeability (leaky gut) and cause a chain reaction of inflammation and autoimmune disease. Diet soda consumption may increase the risk of stroke and causes kidney damage, possibly because of the phosphoric acid used as an acidifying agent to give colas their tangy flavor.

To avoid the harm caused by processed and refined foods, a good general rule is “if it comes in a bag or a box, don’t eat it.” Or, put another way, “Just eat real food.”

Of course, not all foods that come in bags and boxes are harmful, so this isn’t meant to be taken literally. It’s just a helpful guideline. Butter is often packaged in a box, and Trader Joe’s (for some strange reason) packages vegetables in sealed plastic bags. That doesn’t mean you shouldn’t eat butter and vegetables.

But in general, if you follow this guideline, you’ll avoid the foods that are causing the most damage to our health. And that’s more than half the battle.

The three horsemen of the apocalypse: sugar, flour and industrial seed oils

Over 50 percent of the calories the average American consumes today (and my guess is the number is similar in other industrialized countries) come from flour, sugar and industrial seed oils.

We consume flour in the form of bread, pasta, muffins, bagels, crackers, cookies, cakes, and a variety of other processed grain products. We consume sugar in obvious places, like colas and candy bars, and less obvious places like hamburger buns, salad dressing, breakfast cereals, and flavored yogurts. (Sugar is so ubiquitous that the average American now eats 152 pounds of it a year, or about a half a cup a day!) And we consume industrial seed oils—soybean, cottonseed, sunflower, safflower, corn, and canola oils—in just about all processed, packaged and refined foods.

So what's wrong with these ingredients? Why is it such a disaster that they now account for more than half of what we eat on a daily basis?

There are several reasons, but two stand out. First, these foods **promote overeating**. They're high in calories, but low in nutrients, fiber, and water. Nutrients, fiber and water are what make us feel satisfied after eating a food. And if we don't feel satisfied, we don't know when to stop eating.

I'm sure you've all had the experience of sitting down with a bag of potato chips or a pint of ice cream and eating the entire thing in one sitting—even though you weren't particularly hungry. When is the last time this happened with a bowl of broccoli or even a juicy steak? People don't tend to overeat real foods like they do processed and refined foods, because real food satisfies us and nourishes our bodies (see Step 2) in a way that processed and refined food does not.

This overconsumption of “empty calories” is directly to blame for the epidemic of obesity and metabolic disease we're experiencing today. In 2009, US adults consumed about 365 more calories than we did in 1960. During that period the prevalence of obesity increased from 13 to 34 percent and the prevalence of extreme obesity increased from less than one percent to 6 percent. The consequences of this dramatic rise in obesity are

profound: excess weight is now thought to account for one in three deaths that occur in middle aged people in the US each year.

Second, **these foods promote inflammation**, and inflammation is at the root of all modern disease, from cardiovascular disease to autoimmune disorders to allergies to arthritis.

Most of the flour we consume in the US is wheat flour. We now know that up to one in ten people has an inflammatory reaction to one or more compounds in wheat. Gluten is the most well-known, but there are several others, including lectins like wheat germ agglutinin (WGA), proteins called gliadins and glutenin, an opioid peptide called gluteomorphin, and a substance called deamidated gliadin, which is produced by the industrial processing or digestion of gluten.

Gluten intolerance can affect nearly every tissue in the body, including the brain, skin, endocrine system, stomach, liver, blood vessels, smooth muscles and even the nuclei of cells. It is associated with an astonishing variety of diseases, from schizophrenia and epilepsy, to Type 1 diabetes and osteoporosis, to dermatitis and psoriasis, to Hashimoto's hypothyroidism to peripheral neuropathy. Because the range of symptoms associated with gluten intolerance is so broad and nonspecific (e.g. can be attributed to any number of conditions), many patients and doctors don't suspect gluten may be the cause.

Sugar promotes inflammation in several different ways. It disrupts mineral balance, increases blood sugar, causes leaky gut, weakens our immune defenses, and interferes with the absorption of protein, which our cells and tissues need to function properly.

Industrial seed oils contain high amounts of a fatty acid called linoleic acid (LA). When LA is exposed to heat—as it inevitably is during food processing or cooking—harmful compounds called OXLAMs are formed. OXLAMs contribute to a process of cellular damage called “oxidative stress,” and are associated with a variety of inflammatory diseases ranging from Alzheimer’s to fibromyalgia to nonalcoholic fatty liver disease (NAFLD). OXLAMs are a major component of atherosclerotic plaques and play a central role in the development of heart disease. High intakes of linoleic acid are especially problematic when the long-chain omega-3 fat DHA, found exclusively in seafood, is absent from the diet. This creates a pro-inflammatory environment in the body.

STEP 1: ACTION SUMMARY

- If it comes in a bag or a box, don't eat it.
- Base your diet on real, whole foods like meat and fish, fruits and vegetables, nuts and seeds, and starchy plants like potatoes and sweet potatoes.



STEP 2:

Nourish Your Body

Humans require three things to survive: oxygen, water, and food. We can live only a few minutes without oxygen, and only a few days without water. We can live much longer without food (up to three weeks, in some cases), but the quality of the food we eat—and most importantly, the nutrients it contains—is what determines whether we simply survive, or thrive.

There are two types of nutrients in food: macronutrients, which include protein, carbohydrates, and fat, and micronutrients, which are vitamins, minerals, and other compounds required in small amounts for normal metabolic function.

The nutrient density of foods refers primarily to micronutrients and amino acids (the building blocks of protein). Carbohydrates and fats are important to health, but, with the exception of two fatty acids, they can be provided by the human body for a short amount of time if dietary intake is insufficient. The same cannot be said for micronutrients and the essential amino acids found in protein, which must be obtained from the diet.

Humans require about forty different micronutrients (i.e. vitamins, minerals, and trace minerals) to function properly. In fact, every single process that happens in the body—from your eye blinking to your heart beating to your brain comprehending this sentence you're reading—depends upon these micronutrients. When you don't get enough of them, your body can't function as it should and disease begins to develop.

Unfortunately, nutrient deficiency is widespread even in the relatively affluent industrialized world. More than half of Americans are deficient in zinc, calcium, magnesium, vitamin A, vitamin B6, and vitamin E, according to a 1997 survey. Approximately one-third are also deficient in riboflavin, thiamine, folate, vitamin C, and

iron. In many cases, these aren't mild nutrient deficiencies; up to 50 percent of Americans consume less than half of the recommended daily allowance (RDA) for several micronutrients.

This is especially alarming when you consider the fact that the RDA is based on the amount of a nutrient required to avoid *acute* deficiency symptoms. It does not reflect the amount required to avoid deficiency symptoms over an extended period. This amount is not known for most micronutrients, but it is almost certainly higher than the RDA, which means that an even larger percentage of Americans than the number given above are not getting enough of these vitamins and minerals.

Because nutrients fuel all processes in the body, nutrient deficiency affects literally every cell, organ, and tissue. Nutrient deficiency is associated with a long list of problems, including:

- Weakened immune function.
- Premature aging.
- Cancer and cellular damage.
- Cardiovascular disease.
- High blood pressure.
- Lipid (cholesterol) abnormalities.
- Depression and anxiety.
- Infertility.

In truth, it's almost impossible to find a health condition that is not associated with nutrient deficiency, given the importance nutrients play in maintaining optimal function.

The importance of bioavailability

It's not just the amount of nutrients that a food contains that is important, it's how *bioavailable* those nutrients are.

Bioavailability refers to the portion of a nutrient that is absorbed by the body. The amount of nutrients we absorb from a food is invariably lower than the absolute amount of nutrients the food contains.

The nutrients in some foods are more bioavailable to humans than others. For example, the grass on your front lawn is loaded with vitamins and minerals, but they're largely inaccessible to humans. Grass contains large amounts of a plant fiber called cellulose, which humans cannot break down. Since we can't break down the cellulose, we can't absorb the nutrients grass contains.

On the other hand, nutrients in animal products like fish, meat, poultry, dairy, and eggs are highly bioavailable. This means we can absorb them easily.

The key to nourishing your body, then, is to maximize your intake of *bioavailable* nutrients. This will ensure that your body has everything it needs to function optimally.

The nutrient density and bioavailability of foods

The table below ranks foods according to their nutrient density and bioavailability.

HIGH	MEDIUM	LOW
Organ meat	Whole grains*	Refined grains (i.e.bread, pasta, crackers, etc.)
Meat, wild game and poultry	Legumes*	Sugar
Fish and shellfish	Plant fats and oils**	Industrial seed oils
Eggs	Animal fats and oils**	Processed food and snacks
Fruits	Dairy products	Sugar-sweetened beverages
Vegetables		Artificial ingredients
Nuts and seeds*		Alcohol
Herbs and spices		Natural sweeteners

* Whole grains, legumes, and nuts and seeds contain substances called “nutrient inhibitors” that impair the absorption of some of the nutrients they contain.

** Plant and animal fats are relatively low in nutrients, but they play other crucial roles, including helping us to absorb the nutrients in other foods.

If you study the table above for a moment, you might notice several interesting things.

First, all of the most nutrient-dense foods are real, whole foods, and all of the least nutrient-dense foods are processed and refined foods. In *Step 1: Eat Real Food*, I argued that processed and refined foods are destroying our health because they promote overeating and inflammation, and inflammation is at the root of all modern disease. Here we see yet another problem with these foods: they are at the bottom of the scale in terms of nutrient density.

Second, you might be surprised to see that organ meats, meat, fish and shellfish are in the highest category of nutrient density. In fact, when the major nutrients required for human function are considered, these foods are even more nutrient-dense than fruits and vegetables. One serving of beef (about 3.5 ounces) typically contains more B12, niacin (B3), vitamin D, retinol (vitamin A), zinc, iron, potassium, phosphorus, and EPA and DHA than the same amount of blueberries or kale, which are two of the most nutrient-dense plant foods. In addition, the nutrients in meat are highly bioavailable when compared to foods like cereal grains, nuts and seeds, and legumes. The bioavailability of zinc, for example, is four times higher in meat than it is in grains.

But wait a second, you say! Shouldn't we be avoiding red meat because it clogs our arteries and increases the risk of cancer? While early research studies did suggest a link between red meat consumption and these conditions, more recent studies (that were larger and better designed than the previous ones) [have found no connection at all](#). If you'd like to learn more about this, I've written an entire [series of articles](#) debunking the myth that red meat is harmful.

Third, while neither animal nor plant fats are especially nutrient dense, they do play other important roles in the diet. Perhaps most importantly, they help us to absorb the nutrients that are present in other foods. We will revisit healthy fats in Step 3.

Finally, look at where whole grains and legumes are on the table; they're not the nutritional powerhouses you may have been led to believe they are. Not only do they lack important nutrients, but they also contain substances called "nutrient inhibitors" that make it more difficult for us to absorb some of the nutrients they do contain.

Traditional cultures who ate a lot of grains and legumes went to great lengths to break down these nutrient inhibitors so they could better absorb the nutrients in these foods. These methods included soaking, sprouting, fermenting, and leavening. If you have the time and energy to prepare grains and legumes in these ways, and you tolerate them well, there's no reason they can't be part of a diet that emphasizes other more nutrient-dense foods like meat, fish, eggs, and fruits and vegetables. (Likewise, if you eat nuts and seeds, you should soak and then dehydrate or roast them first in order to increase the bioavailability of the nutrients they contain. See [this article](#) to learn more.)

STEP 2 ACTION SUMMARY:

- Emphasize nutrient-dense, whole foods like meat, organ meat, fish and shellfish, eggs, fruits and vegetables, nuts and seeds, and herbs and spices.
- Minimize your intake of flour, sugar and other sweeteners, industrial seed oils, and processed and refined food and snacks of all kinds.
- Eat healthy fats. Though fats aren't especially nutrient-dense, healthy fats are an important part of the diet because they play several other important roles, including helping us to absorb nutrients we get from other foods.
- If you choose to eat nuts, grains, and/or legumes, it's best to soak them prior to cooking to maximize nutrient bioavailability.



STEP 3:

Think Quality, Not Quantity

During the last 50 years, *quantity* has been a much bigger theme than *quality* when it comes to diet and nutrition. We've been told that if we want to lose weight, we need to eat fewer calories and exercise more. We've also been told we need to eat less fat by most mainstream health organizations like the American Heart Association. More recently, some researchers and health experts have suggested that it's not fat that is the problem, but carbohydrates, and that for optimal health we should follow a low-carbohydrate diet.

These recommendations are based on the mistaken idea that the key factor determining our health is either the overall quantity of food we eat, or the quantity of macronutrients like fat and carbohydrate that the food contains.

For example, the low-fat crowd will tell you that eating too much fat—especially of the saturated variety—will make you fat and give you a heart attack. Yet there are many examples of traditional cultures with relatively high fat intakes, and low incidence of obesity and chronic, inflammatory disease. This is true of the Masai tribe in Africa, who get about 60-70 percent of calories from fat (almost entirely from meat, milk or blood) yet are remarkably lean, fit and healthy. And what about the modern French, who have the lowest rate of heart disease of any industrialized country in the world—despite the highest intake of saturated fat?

The low-carb crowd is very much aware of these statistics, which are often used in defense of low-carb diets as the best choice. Tell that to the Kitavans in Melanesia, who get about 70 percent of calories from carbohydrate and, like the Masai, are almost entirely free of obesity, heart disease and other chronic, degenerative diseases that are so common in industrialized societies. We've observed a similar absence of modern

diseases in the Kuna indians in Panama and the traditional Okinawans of Japan, two other healthy indigenous populations that got about 65 percent of calories from carbohydrate.

What about the overall quantity of food we eat? We've known for some time that "counting calories"—purposely eating less—is not a very effective weight loss strategy, especially over the long term. More than 85 percent of people who count calories not only eventually gain back the weight they lost, they gain back even more weight. This leads to a vicious cycle of yo-yo dieting that I'm sure many of you are more familiar with than you'd like to be.

Why quality is more important than quantity

The examples above tell us that when it comes to food, quality is more important than quantity. Humans can thrive on a wide range of macronutrient ratios, ranging from low fat to high fat—as long as they are eating real food. And when you're eating high quality, nutrient-dense food, you are far more likely to eat the right quantity of food to maintain your weight.

But what determines food quality? We've already discussed two important factors: refining/processing (the less refined or processed the better) and nutrient density (the more nutrient dense the better).

In this context, we could say that there are "good carbs" and "bad carbs", "good fats" and "bad fats". Good carbs are those that are both unrefined and nutrient-dense, such as fruits, vegetables and starchy plants like potatoes, sweet potatoes, plantains, taro, etc. Bad carbs are highly processed and refined, and nutrient-poor, like most things made with flour and sugar. Good fats are unprocessed, naturally occurring fats like olive oil, coconut, avocado, butter, and even lard and duck fat when it comes from pasture-raised animals. Bad fats are highly processed and refined industrial seed oils and trans fats.

In most cases it's far more important to focus on the quality of fats and carbohydrates that you eat than the absolute quantity of either. Low-fat and low-carb advocates both like to blame the entire category of either fats or carbohydrates for the obesity and modern disease epidemic. But neither science nor common sense supports this.

Does anyone really believe that eating sweet potatoes and whole fruit has the same effect on the body as eating cookies and doughnuts? Good carbs and good fats haven't made us fat or sick; bad carbs and bad fats have.

There's another important factor that determines the quality of foods we eat, and that's how it's grown, harvested and/or raised. The highest quality produce (fruits and vegetables) is local and organic; the highest quality meat, dairy products, and eggs come from pasture-raised animals; and the highest quality fish is wild-caught.

Let's examine each of these in more detail.

Organic and local produce: more nutrients, fewer chemicals

Organic plant foods contain, on average, 25 percent higher concentrations of 11 nutrients than their conventional counterparts. In particular, they tend to be higher in important polyphenols and antioxidants like vitamin C, vitamin E, and quercetin.

Even more relevant in determining nutrient content is where your produce comes from, and in particular, how long it's been out of the ground before you eat it. Most of the produce sold at large supermarket chains is grown hundreds – if not thousands – of miles away, in places like California, Florida, and Mexico. This is especially true when you're eating foods that are out of season in your local area (like a banana in mid-winter in New York).

A typical carrot, for example, has traveled 1,838 miles to reach your dinner table. Days—maybe more than a week—have passed since it was picked, packaged and trucked to the store, where it can sit on the shelves even longer.

The problem with this is that food starts to change as soon as it's harvested and its nutrient content begins to deteriorate. Total vitamin C content of red peppers, tomatoes, apricots, peaches and papayas has been shown to be higher when these crops are picked ripe from the plant. This study compared the Vitamin C content of supermarket broccoli in May (in season) and supermarket broccoli in the Fall (shipped from another country). The result? The out-of-season broccoli had only half the vitamin C of the seasonal broccoli.

Without exposure to light (photosynthesis), many vegetables lose their nutrient value. If you buy vegetables from the supermarket that were picked a week ago, transported to the store in a dark truck, and then stored in the middle of a pile in the produce section, and then you put them in your dark refrigerator for several more days before eating them, chances are they've lost much of their nutrient value. A study at Penn State University found that spinach lost 47 percent of its folate after 8 days.

This is why buying your produce at local farmer's markets, or even better, picking it from your backyard garden, are better options than buying conventional produce shipped from hundreds or thousands of miles away. Fruits and vegetables from local farms are usually stored within one or two days of picking, which means their nutrient content will be higher. And as anyone who's eaten a fresh tomato right off the vine will tell you, local produce tastes so much better than conventional produce it might as well be considered a completely different food.

Another important benefit of organic produce, of course, is that it's grown without pesticides, herbicides and other harmful chemicals that have been shown to cause health problems – especially in vulnerable populations like children. A study published in the journal *Pediatrics* concluded that children exposed to organophosphate pesticides at levels typically found in conventional produce are more likely to develop attention deficit hyperactivity disorder (ADHD).

A panel of scientists convened by President Obama to study the effect of environmental toxins on cancer released a report in 2010 urging Americans to eat organic produce grown without pesticides, fertilizers or other chemicals. The report states that the U.S. government has grossly underestimated the number of cancers caused by environmental toxins. Furthermore, the report especially highlights the risk of toxins in conventionally grown foods to unborn children. Exposure to harmful chemicals during this critical period can set a child up for lifelong endocrine disruption, hormone imbalances, and other problems.

Pasture-raised animal products and wild-caught fish: as nature intended

Several studies have been done comparing the nutrient content of pasture-raised (PR) and grain-fed (confinement animal feeding operations, or CAFO) animal products. PR animal products are superior to CAFO in 2 primary respects: they have a better fatty acid profile, and higher levels of vitamins and other micronutrients.

Grain-fed animals have lower levels of anti-inflammatory omega-3 fats like EPA and DHA. The more grain in an animal's diet, the lower the omega-3 levels in their meat. For example, grass-fed beef typically has 3 times more omega-3 than grain-fed beef.

In addition to higher levels of beneficial omega-3 fat, pasture-raised animal products also have much higher levels of several vitamins and minerals, including:

- 288 percent more vitamin E
- 54 percent more beta-carotene
- Twice as much riboflavin (B2)
- Three times as much thiamin (B1)
- Four times as much selenium
- 30 percent more calcium
- 5 percent more magnesium

We see a similar difference between eggs from hens raised on pasture, and those raised in confinement. Eggs from pasture-raised hens contain as much as 10 times more omega-3 than eggs from factory hens, and they are significantly higher in B12 and folate. They also have higher levels of fat-soluble antioxidants like vitamin E and a denser concentration of vitamin A.

In the case of fish, farmed fish contain less omega-3 relative to linoleic acid (omega-6). For example, wild salmon contains 10 times more omega-3 than omega-6, whereas farmed salmon has less than 4 times the amount of omega-3 than omega-6. Another study found that consuming standard farmed salmon, raised on diets high in omega-6, raises blood levels of certain inflammatory chemicals linked to increased risk of cardiovascular disease, diabetes, Alzheimer's and cancer. Wild salmon also contains

4 times as much vitamin D as farmed salmon, which is especially important since up to 50 percent of Americans are deficient in this important vitamin.

STEP 3: ACTION SUMMARY

- Focus more on the quality of foods you eat than the quantity. When you eat high-quality foods, the quantity takes care of itself.
- Choose local and organic produce whenever possible.
- Choose pasture-raised animal products and wild-caught fish whenever possible.



STEP 4:

Heal Your Gut

“All disease begins in the gut.”

Hippocrates said this more than 2,000 years ago, but we’re only now coming to understand just how right he was. Research over the past two decades has revealed that gut health is critical to overall health, and an unhealthy gut contributes to a wide range of diseases including diabetes, obesity, rheumatoid arthritis, autism spectrum disorder, depression, and chronic fatigue syndrome.

In fact, many researchers (including myself) believe that supporting intestinal health and restoring the integrity of the gut barrier will be one of the most important goals of medicine in the 21st century.

“All disease begins in
the gut.”

There are two closely related variables that determine our gut health: the intestinal microbiota, or “gut flora”, and the gut barrier. Let’s discuss each of them in turn.

The gut flora: a healthy garden needs healthy soil

Our gut is home to approximately 100,000,000,000,000 (100 trillion) microorganisms. That’s such a big number our human brains can’t really comprehend it. One trillion dollar bills laid end-to-end would stretch from the earth to the sun—and back—with a lot of miles to spare. Do that 100 times and you start to get at least a vague idea of how much 100 trillion is.

The human gut contains 10 times more bacteria than all the human cells in the entire body, with over 1,000 known diverse bacterial species. In fact, you could say that we're more bacterial than we are human. Think about that one for a minute.

We've only recently begun to understand the extent of the gut flora's role in human health and disease. Among other things, the gut flora promotes normal gastrointestinal function, provides protection from infection, regulates metabolism, and comprises more than 75 percent of our immune system. Dysregulated gut flora has been linked to diseases ranging from autism and depression to autoimmune conditions like Hashimoto's, inflammatory bowel disease, and type 1 diabetes.

Unfortunately, several features of the modern lifestyle directly contribute to unhealthy gut flora:

- Antibiotics and other medications like birth control and NSAIDs
- Diets high in refined carbohydrates, sugar and processed foods
- Diets low in fermentable fibers
- Dietary toxins like wheat and industrial seed oils that cause leaky gut
- Chronic stress
- Chronic infections

Antibiotics are particularly harmful to the gut flora. Recent studies have shown that antibiotic use causes a profound and rapid loss of diversity and a shift in the composition of the gut flora. This diversity is not recovered after antibiotic use without intervention.

We also know that infants that aren't breast-fed and are born to mothers with bad gut flora are more likely to develop unhealthy gut bacteria, and that these early differences in gut flora may predict overweight, diabetes, eczema/psoriasis, depression and other health problems in the future.

The gut barrier: the gatekeeper that decides what gets in and what stays out

Have you ever considered the fact that the contents of the gut are technically outside the body? The gut is a hollow tube that passes from the mouth to the anus. Anything that

goes in the mouth and isn't digested will pass right out the other end. This is, in fact, one of the most important functions of the gut: to prevent foreign substances from entering the body.

When the intestinal barrier becomes permeable (i.e. leaky gut syndrome), large protein molecules escape into the bloodstream. Since these proteins don't belong outside of the gut, the body mounts an immune response and attacks them. Studies show that these attacks play a role in the development of autoimmune diseases like Hashimoto's and type 1 diabetes, among others.

In fact, experts in mucosal biology like Dr. Alessio Fasano now believe leaky gut is a precondition to developing autoimmunity:

There is growing evidence that increased intestinal permeability plays a pathogenic role in various autoimmune diseases including [celiac disease] and [type 1 diabetes]. Therefore, we hypothesize that besides genetic and environmental factors, loss of intestinal barrier function is necessary to develop autoimmunity.

The phrase "leaky gut" used to be confined to the outer fringes of medicine, employed by alternative practitioners with letters like D.C., L.Ac, and N.D. after their names. Conventional researchers and doctors originally scoffed at the idea that a leaky gut contributes to autoimmune problems, but now they're eating their words. It has been repeatedly shown in several well-designed studies that the integrity of the intestinal barrier is a major factor in autoimmune disease.

This new theory holds that the intestinal barrier in large part determines whether we tolerate or react to toxic substances we ingest from the environment. The breach of the intestinal barrier (which is only possible with a leaky gut) by food toxins like gluten and chemicals like arsenic or BPA causes an immune response which affects not only the gut itself, but also other organs and tissues. These include the skeletal system, the pancreas, the kidney, the liver, and the brain.

This is a crucial point to understand: you don't have to have gut symptoms to have a leaky gut. Leaky gut can manifest as skin problems like eczema or psoriasis, heart failure, autoimmune conditions affecting the thyroid (Hashimoto's) or joints (rheumatoid arthritis), mental illness, autism spectrum disorder, depression, and more.

Researchers have identified a protein called zonulin that increases intestinal permeability in humans and other animals. This led to a search of the medical literature for illnesses characterized by increased intestinal permeability (leaky gut). Imagine their surprise when the researchers found that many, if not most, autoimmune diseases—including celiac disease, type 1 diabetes, multiple sclerosis, rheumatoid arthritis and inflammatory bowel disease—are characterized by abnormally high levels of zonulin and a leaky gut. In fact, researchers have found that they can induce type 1 diabetes almost immediately in animals by exposing them to zonulin. They develop a leaky gut and begin producing antibodies to islet cells, which are responsible for making insulin.

One of the main reasons to avoid wheat and other gluten-containing grains is that they contain a protein called gliadin, which has been shown to increase zonulin production and thus directly contribute to leaky gut in susceptible people.

But what else can cause leaky gut? In short, the same things I listed above that destroy our gut flora: poor diet, medications (antibiotics, NSAIDs, steroids, antacids, etc.), infections, stress, hormone imbalances, and neurological conditions (brain trauma, stroke and neurodegeneration).

Leaky gut = fatigued, inflamed and depressed

Here's the takeaway. Leaky gut and bad gut flora are common because of the modern lifestyle. If you have a leaky gut, you probably have bad gut flora, and vice versa. And when your gut flora and gut barrier are impaired, you will be inflamed. Period.

This systemic inflammatory response then leads to the development of autoimmunity. And while leaky gut and bad gut flora may manifest as digestive trouble, in many people it does not. Instead it shows up as problems as diverse as heart failure, depression, brain fog, eczema/psoriasis and other skin conditions, metabolic problems like obesity and diabetes and allergies, asthma and other autoimmune diseases.

To adequately address these conditions, you must rebuild healthy gut flora and restore the integrity of your intestinal barrier. This is especially true if you have any kind of autoimmune disease, whether you experience digestive issues or not.

STEP 4: ACTION SUMMARY

The most obvious first step in maintaining a healthy gut is to avoid all of the things I listed above that destroy gut flora and damage the intestinal barrier. But of course that's not always possible, especially in the case of chronic stress and infections. Nor did we have any control over whether we were breast-fed or whether our mothers had healthy guts when they gave birth to us.

If you've been exposed to some of these factors, there are still steps you can take to restore your gut flora:

- Avoid foods and chemicals that irritate the gut
- Eat plenty of fermentable fibers (starches like sweet potato, yam, yucca, etc.)
- Eat fermented foods like kefir, yogurt, sauerkraut, kim chi, etc.
- Consider taking a probiotic (I prefer soil-based organisms) and/or a prebiotic supplement
- Treat any intestinal pathogens (such as parasites) that may be present
- Manage your stress (see Step 7)



STEP 5:

Move Like Your Ancestors

Humans have always been physically active. Our ancestors and contemporary hunter-gatherers walked an average of 10,000 steps (about five miles) per day, with frequent bouts of more intense physical activity.

Even in most Western societies, people were highly physically active until the Industrial Revolution. In the 1800s, approximately 90 percent of jobs in America required manual labor.

Yet today, we've become a nation of sitters. Fewer than 2 percent of jobs require manual labor. We spend endless hours working at computers, watching TV, playing video games, or commuting. The typical US adult is now sedentary for 60 percent of his or her waking hours, and sits for an average of six hours (and often much more, in the case of those who work desk jobs and/or with computers). A sedentary office worker expends only ten calories per pound each day, down from the hunter-gatherer's average of 43 to 55 calories per pound per day.

Why sitting is the new smoking

We weren't born to sit all day. We're genetically designed to be physically active. The dramatic increase in sitting has had a profound, negative effect on almost every aspect of human health, from the cardiovascular and pulmonary systems to the immune system.

Here are just a few specific ways that sitting harms us:

- It wrecks our metabolic function.
- It decreases the activity of enzymes that help us to burn fat, and protect us from cardiovascular disease.
- It reduces the action of insulin.
- It weakens the bones.

Most disturbingly, sitting too much shortens our lifespans. In an Australian study that followed participants over six-and-a-half years, researchers found that high levels of TV time were significantly associated with increased risk of death from heart disease as well as all other causes. Each hour of TV was associated with an 11 percent increase in death from all causes. By contrast, those who watched less than two hours of TV a day had a 46 percent lower risk of death from all causes when compared to those who watched more than four hours. These associations were independent of exercise and traditional risk factors such as smoking, blood pressure, cholesterol levels, waist circumference, and diet.

This is why some health experts have claimed that “sitting is the new smoking.” Sitting a lot shortens our lifespans to a degree that is similar to smoking cigarettes. It’s a major public health challenge that, up until recently, few were aware of.

Exercise isn’t the answer: The “active couch potato” problem

You might be thinking something along the lines of, *Okay, I sit a lot—but I also work out a lot, so I’m good.*

Here’s the shocker: too much sitting and sedentary time is harmful **even if you’re getting enough exercise**. This means you could be meeting the recommended government guidelines for exercise (that is, thirty minutes of moderate to vigorous activity five days a week) but still be at high risk of heart disease if you sit for long periods each day. A large study involving over one hundred thousand U.S. adults found that those who sat for more than six hours a day had up to a 40 percent greater risk of death over the next fifteen years than those who sat for less than three hours a day regardless of whether the participants exercised.

This doesn’t mean exercise isn’t helpful, or necessary. It is. It just means that exercise alone isn’t enough to offset the harmful effects of too much sitting.

So what is the solution?

It can be broken down into three parts:

- Less sitting (and more standing)
- More walking and “non-exercise physical activity”
- Regular periods of more intense physical activity (i.e. “exercise”)

Less sitting (and more standing)

The simplest way to sit less is to stand more. Standing engages postural muscles that increase fat burning activity, among other benefits. Standing and walking slowly increases energy expenditure by two and a half times; employees who stand while they work burn up to 75 percent more calories per day than people in sedentary jobs.

I recommend a goal of standing for about half of the day, and taking a standing break every forty to fifty minutes during prolonged periods of sitting.

Here are a few ways to reduce your sitting time:

- Get a standing desk. This isn't always possible, depending on your work environment, but many employers are now allowing it.
- Take standing breaks. Stand for at least two minutes every forty to fifty minutes. Take a brief walk or do some light stretching. Even short breaks like this make a big difference.
- Stand up at long meetings. If you're worried about what people will think, just tell them you have a bad back!

More walking and “non-exercise physical activity”

Non-exercise physical activity refers to all forms of physical activity other than distinct periods of exercise. This includes activities like gardening, performing household chores, walking, commuting by bicycle to work, etc.

You might be surprised to learn that even a relatively low to moderate level of physical activity will lower your post-meal blood sugar, insulin levels, and triglycerides, as well as reduce your waist circumference. You don't have to join a CrossFit gym or do crazy amounts of physical activity in order to improve your fitness and health. Sometimes it's the smaller changes that are the most important. Besides, it's easier (and cheaper) to

integrate a low-intensity activity into your daily life than an intensive, formal workout (like that expensive class at the gym you have to drive to).

Again, I'm not suggesting that exercise isn't important. But I am saying that if you sit for most of the day and week, and think that going to the gym three or four times a week for an hour is enough, you're mistaken. You have to increase your "non-exercise physical activity" in order to really protect yourself against the harmful effects of too much sitting.

Here are some ideas for how to do that:

- Take walking meetings.
- Use the stairs whenever possible.
- Walk or bicycle to work. (If you live too far away to walk or ride exclusively, consider driving or taking public transport part of the way, and walking or cycling for the remainder.)
- Do your own chores.
- Get a dog.

As a general goal, I suggest that most people aim for 10,000 steps a day. You can measure your steps with an activity tracker like the FitBit or Jawbone.

Regular periods of more intense physical activity (i.e. "exercise")

In addition to standing more and doing more non-exercise physical activity, you should also incorporate regular periods of more vigorous activity (aka "exercise").

Your goal should be:

- 150 minutes of moderate-intensity activity per week (like jogging, yoga, or dancing); or,
- 75 minutes of vigorous-intensity activity per week (like running, Zumba, or playing sports); or,
- 30 sets of highest-intensity activity per week (like sprinting, jumping rope, or resistance training); or,
- Some combination of the above


Moderate, vigorous, and highest-intensity activity are defined as follows:

- Moderate: 50 to 70 percent of maximum effort
- Vigorous: 70 to 90 percent of maximum effort
- Highest-intensity: greater than 90 percent of maximum effort

You can do this higher intensity activity in designated workouts or simply integrate it into your daily routine. For example, if you work at home, you can pepper in vigorous or highest intensity activities throughout your day, such as push-ups, pull-ups, jumping rope, etc.

STEP 5: ACTION SUMMARY

- Sit less. As a general guideline, aim for standing at least 50 percent of your day.
- Increase your non-exercise physical activity. Aim for 10,000 steps a day on average.
- Incorporate regular periods of more vigorous activity (exercise) throughout the week.



STEP 6:

Sleep More Deeply

Insomnia has reached epidemic proportions. It's estimated to be the #1 health-related problem in America. More than 1/3 of Americans have trouble sleeping every night, and 51 percent of adults say they have problems sleeping at least a few nights each week. 43 percent of respondents report that daytime sleepiness interferes with their normal daytime activities.

These problems are getting worse, not better. The number of adults aged 20 to 44 using sleeping pills doubled from 2000 to 2004, and the number of kids ages 1–19 who take prescription sleep remedies jumped 85 percent during the same period. Prescriptions for sleeping pills topped 56 million in 2008—up 54 percent from 2004—with over \$5 billion in sales in 2010.

This isn't surprising in a culture that values productivity and activity above all else, and is almost scornful of rest and relaxation. "Resting" for many people means watching TV, browsing the internet or engaging with some other kind of electronic device that is anything but restful for the brain and the body. We have not only forgotten the value of rest, we have forgotten how to do it.

You cannot be healthy without adequate sleep. Period.

Unfortunately for us, the body hasn't forgotten the importance of sleep. It's absolutely essential for basic maintenance and repair of the neurological, endocrine, immune, musculoskeletal and digestive systems. The hormone melatonin naturally increases after sundown and during the night in a normal circadian rhythm, which increases immune cytokine function and helps protect us against infection. (This is why you're so likely to get a cold or flu after not sleeping well for a few nights.)

In fact, sleep is so important to our overall health that total sleep deprivation has been proven to be fatal: lab rats denied the chance to rest die within two to three weeks. Among other things, a full night's sleep:

- Enhances memory and mental clarity.
- Improves athletic performance.
- Boosts mood and overall energy.
- Improves immune function.
- Increases stress tolerance.

When things fall apart: how sleep deprivation destroys your health

A large body of evidence suggests that most people need seven to eight hours of sleep to function properly. Getting fewer than six hours of sleep per day is associated with low-grade chronic inflammation and worsening insulin resistance, as well as increased risk for obesity, type 2 diabetes and cardiovascular disease (CVD).

This is highly significant in light of a recent cross sectional study demonstrating that nearly one-third of US adults get less than six hours of sleep per 24 hour period.

Inadequate rest impairs our ability to think, to handle stress, to maintain a healthy immune system and to moderate our emotions. It's associated with heart disease, hypertension, weight gain, diabetes, and a wide range of psychiatric disorders including depression and anxiety.

The following is an abbreviated list of some of the more damaging effects of sleep deprivation:

- **Impaired immune system:** A study from the University of California found that even modest sleep loss weakens the immune systems response to disease and injury.
- **Overweight and obesity:** Recent studies have shown that even one night of poor sleep can result in dramatic changes in appetite and food intake. Others have shown that restricting sleep to 5 hours a night for just one week impairs carbohydrate tolerance and insulin sensitivity. Researchers now believe that sleep

deprivation is the single best predictor of overweight and obesity in children – which has become an alarming problem.

- **Cognitive decline:** Sleep deprivation negatively impacts short-term and working memory, long-term memory, and the generation of nerve cells, all of which effect our ability to think clearly and function well.
- **Mood and mental health:** Anyone who has had a few nights of poor sleep can tell you that insomnia is associated with depression. Insufficient sleep shuts down the pre-frontal cortex and can cause or exacerbate a number of psychological conditions, ranging from anxiety to PTSD to depression.
- **Systemic inflammation:** As I already mentioned above, sleep deprivation causes chronic, low-grade inflammation. And we now know that inflammation is the root of all modern disease.
- **Increased risk of death:** Last, but certainly not least, not getting enough sleep shortens your lifespan.

Of course, I could go on. There's really no disease or medical condition that sleep deprivation doesn't either contribute to directly or make worse.

I firmly believe that lack of sleep and stress are two of the biggest health challenges we face today. There's no doubt that a clean diet is the cornerstone of health, but it's much easier for most people to make changes in their diet than it is for them to improve their sleep and manage their stress.

And here's the thing, you can eat a perfect diet and take all the right supplements, but if you're not sleeping well and managing your stress, all bets are off. I see this every day in my private practice.

How to get a good night's sleep

Before we get into natural tips on improving sleep, I want to say a few words about sleep medications. In spite of their popularity, they are not without risks, including dependence, rebound insomnia, drowsiness, memory loss, bizarre sleep walking behavior, changes in brain chemistry, constipation, and much more.

On the other hand, there is a point at which the harmful effects of sleep deprivation start to outweigh the potential adverse effects caused by sleeping pills. This is when I believe sleep meds should be used as a last resort, presuming all non-drug approaches have failed. Once you get into extreme sleep debt, it can be difficult to make it out without some biochemical assistance.

That said, there are many ways to prevent this from happening in the first place and to naturally improve the quality of your sleep if it's poor.

Reduce your exposure to artificial light

Artificial light disrupts our circadian rhythm and throws off our sleep. Just a single 'pulse' of artificial light at night disrupts the circadian mode of cell division, which can not only impact our sleep, but also increase our risk of cancer. Another study showed that the blue light emitted from alarm clocks and other digital devices suppresses melatonin production in a dose-dependent manner.

Follow these tips to avoid light exposure:

- Don't use a computer, tablet, phone, or other electronic device for two hours before going to bed. No staying up late on Facebook and Twitter!
- Use blackout shades to make your bedroom pitch black.
- Cover your digital alarm clock or get an analog clock.
- Turn off all digital devices that glow or give off any type of light.
- Purchase orange goggles that block out the spectrum of light that interferes with melatonin production. ([These are a good choice.](#))

Don't be too full – or too hungry

Some people sleep better after eating a light dinner. This is especially true for those with digestive issues. Others—like those with a tendency toward hypoglycemia—do better with a snack before bed (and possibly even during the night).

Go to bed earlier

You've all heard the saying "an hour before midnight is worth two hours after." It turns out there is some truth to that. When you fall asleep, you go through a 90-minute cycle of non-REM sleep followed by REM sleep. But the ratio of non-REM to REM sleep within

those 30 minute cycles changes across the night. In the early part of the night (11pm–3am), the majority of those cycles are composed of deep non-REM sleep (stages three and four) and very little REM sleep. In the second half of the night (i.e. 3am–7am) this balance changes, such that the 90-minute cycles are comprised of more REM sleep (the stage associated with dreaming) as well as a lighter form of non-REM sleep (stage two).

What's important about this is that deep stage three and four sleep is where our body regenerates and repairs tissue and engages in other restorative processes. If we don't get enough deep sleep, we can't rejuvenate and heal.

When good sleep hygiene isn't enough

I'm reluctant to make any recommendations about supplements and nutrients for sleep problems, because the decision about what to take depends on what the underlying cause of the problem is in the first place.

In general, though, magnesium is a good choice. Many people don't get enough and it is not toxic at daily doses up to 800 mg. It's also cheap and easy to find. I prefer the chelated forms of magnesium like glycinate and malate, but others like a product called Natural Calm, which is mixed in warm water before bed. Be careful—it can have a laxative effect.

Melatonin is another commonly used sleep aid. It's a great choice in low doses, for short-term use. Why? Because melatonin is a hormone. Taking any supplemental hormone can disrupt our natural regulatory mechanisms of that hormone and throw our internal production of it out of whack. This can create dependence over time and disrupt our circadian rhythm, which is crucial not only to sleep, but to overall health.

What I recommend instead to all of my patients with sleep issues—and what I use myself—is a program called [Rest Assured](#). The premise behind the program, which I agree with completely, is that the most important factor in getting a good night's sleep is managing stress during the day.

Most of us run around like chickens with their heads cut off all day and then wonder why we can't fall right asleep as soon as our head hits the pillow. If our nervous system has been in overdrive for 16 hours, it's unrealistic to assume that it can switch into low gear in

a matter of minutes simply because we want it to. Of course this is why sleeping pills are growing in popularity each year.

The Rest Assured program has simple, easy-to-follow breathing and movement exercises designed to promote daytime relaxation and a good night's sleep. It helped me and my patients tremendously. You can try a sample exercise (audio and pictures) [here](#).

STEP 6: ACTION SUMMARY

- Make sleep a priority. Allow between seven and eight hours for sleep each night.
- Reduce your exposure to artificial light at night.
- Don't go to bed too hungry, or too full.
- Consider magnesium, melatonin and/or the Rest Assured program to improve your sleep.



STEP 7:

Manage Your Stress

Of all of the 9 steps, stress management is perhaps the most important. Why? Because no matter what diet you follow, how much you exercise and what supplements you take, if you're not managing your stress you will still be at risk for modern degenerative conditions like heart disease, diabetes, hypothyroidism and autoimmunity.

I see this every day in my practice. I have a lot of patients that are following a “perfect” diet, and yet they are still sick. Stress is often the cause. (I'll define stress more clearly in a moment.) Yet as pervasive as stress is, many people don't do anything to mitigate its harmful effects. The truth is it's a lot easier to make dietary changes and pop some pills (whether drugs or supplements) than it is to manage our stress. Stress management bumps us up against core patterns of belief and behavior that are difficult to change.

I suspect this is why all of the articles I've written about stress management are among the least shared on Facebook and Twitter and have elicited the fewest comments. I think many of you may feel defeated or overwhelmed by stress. I understand this. Stress management is hard. It asks a lot of us. It forces us to slow down, to step back, to disengage (if only for a brief time) from the electric current of modern life. It asks us to prioritize self-care in a culture that does not value it.

While I feel your pain, and still struggle with stress management myself, I've got to lay down some tough love here. If you're not doing some form of regular stress management, you will sabotage all of your best efforts with diet, exercise and supplements. Stress management is absolutely crucial to optimal health and longevity. If most health conscious people spent even half the amount of time they spend focusing on nutrition and exercise on managing their stress, they'd be a lot better off.

I'm going to suggest several strategies for stress management at the end of the article, but first let's define stress more explicitly and learn more about the harm it causes.

What is stress?

Hans Selye, the famous physiologist who coined the term “stress”, defined it this way:

...the nonspecific response of the body to any demand made upon it.

The prominent psychologist Richard Lazarus offers a similar definition:

...any event in which environmental demands, internal demands, or both tax or exceed the adaptive resources of an individual...

At the simplest level, then, stress is a disturbance of homeostasis. Homeostasis is the body's ability to regulate its inner environment. When the body loses this ability, disease occurs.

The adrenals are two walnut-shaped glands that sit atop the kidneys. They secrete hormones—such as cortisol, epinephrine, and norepinephrine—that regulate the stress response. Because of this, the adrenals are what determine our tolerance to stress and are also the system of our body most affected by stress.

Most people are aware of the obvious forms of stress that affect the adrenal glands: impossibly full schedules, driving in traffic, financial problems, arguments with a spouse, losing a job and the many other emotional and psychological challenges of modern life. But other factors not commonly considered when people think of “stress” place just as much of a burden on the adrenal glands. These include blood sugar swings, gut dysfunction, food intolerances (especially gluten), chronic infections, environmental

toxins, autoimmune problems, inflammation, and overtraining. All of these conditions sound the alarm bells and cause the adrenals to pump out more stress hormones.

Adrenal stress is probably the most common problem we encounter in functional medicine, because nearly everyone is dealing with at least one of the factors listed above. Symptoms of adrenal stress are diverse and nonspecific, because the adrenals affect every system in the body. But some of the more common symptoms are:

- Fatigue.
- Headaches.
- Decreased immunity.
- Difficulty falling asleep, staying asleep and waking up.
- Mood swings.
- Sugar and caffeine cravings.
- Irritability or lightheadedness between meals.
- Eating to relieve fatigue.
- Dizziness when moving from sitting or lying to standing.
- Digestive distress.

How does stress harm the body?

The short answer is “in every way imaginable.” It would take books to explain the full effects of stress. And those books have been written. Check out *Why Zebras Don't Get Ulcers* by Robert Sapolsky and *When the Body Says No: Exploring the Stress-Disease Connection* by Gabor Mate for a more thorough investigation. I'm just going to summarize here.

When stress becomes chronic and prolonged, the hypothalamus is activated and triggers the adrenal glands to release a hormone called cortisol. Cortisol is normally released in a specific rhythm throughout the day. It should be high in the mornings when you wake up (this is what helps you get out of bed and start your day), and gradually taper off throughout the day (so you feel tired at bedtime and can fall asleep).

Recent research shows that chronic stress can not only increase absolute cortisol levels, but more importantly it disrupts the natural cortisol rhythm. And it's this broken cortisol rhythm that wreaks so much havoc on your body. Among other effects, it:

- Raises your blood sugar.
- Weakens your immune system.
- Makes your gut leaky.
- Makes you hungry and crave sugar.
- Reduces your ability to burn fat.
- Suppresses your HPA-axis, which causes hormonal imbalances.
- Reduces your DHEA, testosterone, growth hormone and TSH levels.
- Increases your belly fat and makes your liver fatty.
- Causes depression, anxiety and mood imbalances.
- Contributes to cardiovascular disease.

These are all well-documented in the scientific literature, and the list of health problems caused by stress goes on. And on. In fact it's not a stretch to suggest that stress contributes to all modern, chronic disease.

But most people don't need much convincing of this. You've witnessed the negative effects of stress firsthand, every day of your life. So the question is, what do you do about it?

How to reduce the impact of stress

There are two different approaches to reducing the impact of stress, and both are important:

- Reduce the amount of stress you experience.
- Mitigate the harmful effects of stress you can't avoid.

Reducing the amount of stress you experience

Reducing stress means just what it sounds like: reducing your total exposure to all forms of stress, whether psychological or physiological. Of course it's never possible to

completely remove stress from our lives. But even in the most stressful of circumstances, it's still possible to reduce stress.

The first step is to avoid unnecessary stress. This often seems obvious, but it isn't. It's easy to overlook habitual patterns of thought and behavior that cause unnecessary stress above and beyond the stress we can't avoid. Here are a few guidelines for how to avoid this kind of stress:

- **Learn to say “no”.** Know your limits, and don't take on projects or commitments you can't handle.
- **Avoid people who stress you out.** You know the kind of person I'm talking about. Drama kings and queens. People who are constantly taking and never giving. Limit your time with these people or avoid them entirely.
- **Turn off the news (or at least limit your exposure to it).** If watching the world go up in flames stresses you out, limit your exposure to the news. You'll still find out what's going on and still be able to act as a concerned citizen. But you'll have more time for yourself. I stopped getting the paper years ago (except for Sunday), and don't even have a TV. Believe it or not, I'm still well-informed. The difference is I get to choose what I'm exposed to.
- **Give up pointless arguments.** This is especially true for useless internet debating. There is obviously a place for discussion and debate, and working towards change. But have you noticed that most arguments don't lead to change? In fact, they tend to have the opposite effect—each side becomes more defended and entrenched in their worldview. Find other ways to get your point across, learn to listen with empathy, and don't waste precious time and energy trying to convert fundamentalists to your religion.
- **Escape the tyranny of your to-do list.** Each day spend some time in the morning really considering what needs to be done that day. Drop unimportant tasks to the bottom of the list. Better yet, cross them off entirely. The world will go on.

The second step in reducing the amount of stress you experience is to address any physiological problems that are taxing your adrenals. These causes include anemia, blood sugar swings, gut inflammation, food intolerances (especially gluten), essential fatty acid deficiencies and environmental toxins. If you have one or more of these conditions, it's probably best to get help from a skilled practitioner.

Mitigating the harmful effects of stress you can't avoid

Obviously there are times when we just can't avoid stress. Maybe we have a high-stress job, or we're caring for an ailing parent, or we're having difficulty with our partner or spouse. In these situations it's not about reducing stress itself, but about reducing its harmful effects.

How do you do that? There are several different strategies:

- **Reframe the situation.** We experience stress because of the meaning we assign to certain events or situations. Sometimes changing our perspective is enough to relieve the stress. For example, being stuck in traffic can be a “disaster” or it could be an opportunity for contemplation and solitude.
- **Lower your standards.** This is especially important for you perfectionists out there. Don't let the perfect be the enemy of the good. Let good enough be good enough.
- **Practice acceptance.** One of my meditation teachers used to say “All suffering is caused by wishing the moment to be other than it is.” Many things in life are beyond our control. Learn to accept the things you can't change.
- **Be grateful.** Simply shifting your focus from what is not okay or not enough, to what you're grateful for or appreciative of can completely change your perspective—and relieve stress.
- **Cultivate empathy.** When you're in a conflict with another person, make an effort to connect with their feelings and needs. If you understand where they're coming from, you'll be less likely to react and take it personally.
- **Manage your time.** Poor time management is a major cause of stress. When you're overwhelmed with commitments and stretched too thin, it's difficult to stay present and relaxed. Careful planning and establishing boundaries with your time can help.

In addition to everything I've listed above, one of the most important things you can do to manage stress is to bring more pleasure, joy and fun into your life. This is the subject of Step 9, so I'll just mention it briefly here.

Stress management practices and techniques

All of the stress management tips above are important and can make a huge difference in your health and well-being. However, there's a certain amount of stress in modern life that is simply unavoidable for most of us. That's why it's so crucial to have a regular stress management practice.

There are a lot of options here, of course. Things like exercise, yoga, tai qi, qi gong, a walk on the beach, etc. can all relieve stress. I'll just share the practices I've found to be most helpful for myself and my patients over the years.

Meditation

In spite of the fact that I'm listing it here, I don't consider meditation as a "stress management" technique—although it can certainly have that effect. Meditation is an awareness practice. Through meditation we learn to witness our thoughts, feelings and sensations and dis-identify with the story we tell ourselves about them. We learn to stay present to our lives even in the face of great difficulty or pain.

Contrary to popular belief, you don't have to be able to "relax" to meditate. Sometimes we are relaxed during meditation; sometimes we are quite agitated. We don't meditate to manipulate our feelings, but to learn to observe them without reacting to or "becoming" them.

One of the books I often recommend to people who'd like to learn more about meditation practice is *Opening the Hand of Thought*, by Kosho Uchiyama. Another excellent resource is *Meditation for Beginners* by Jack Kornfield.

Mindfulness-based stress reduction

Mindfulness-Based Stress Reduction (MBSR) combines mindfulness meditation and yoga to cultivate greater awareness of the unity of mind and body, as well as of the ways the unconscious thoughts, feelings, and behaviors can undermine emotional, physical, and spiritual health. It was developed by Jon Kabat-Zinn at the Stress Reduction Clinic at the University of Massachusetts Medical Center in 1979.

Through clinical research at the University of Massachusetts and elsewhere, MBSR has been shown to positively effect a range of autonomic physiological processes, such as

lowering blood pressure and reducing overall arousal and emotional reactivity. MBSR is offered as an 8-week intensive training in hospitals and medical centers around the world. You can also learn via home study with books and [audio recordings](#). MBSR is particularly effective for anyone struggling with chronic illness or pain.

Yoga

The word yoga comes from the Sanskrit yuj, which means “to unite.” Today, yoga is used as a general term to refer to physical, mental, and spiritual disciplines that originated in ancient india. Yoga has been shown to reduce stress as well as improve cardiovascular and respiratory health, flexibility, cognitive performance, and overall well-being. It is particularly effective in relieving stress-induced or stress-related disorders such as insomnia, anxiety, depression, hypertension, and asthma.

Yoga is a great choice for stress management for several reasons. First, it’s a movement-based practice, which is often suitable for people who are new to stress management or who have very busy minds and find it difficult to sit still. Second, yoga is often practiced in a group or class setting, which has additional benefits. Third, because of its popularity, it’s now easy to find a class in most places.

Biofeedback

Biofeedback is a process of becoming aware of the body’s physiological functions. Specialized sensors deliver information about blood pressure, heart rate, skin temperature, and muscle tension, which the participant uses to learn to modify his or her physiological response to stress.

Biofeedback has been shown to significantly reduce stress and anxiety in groups of people who are highly stressed, such as nursing students and physicians. It has also been shown to reduce chronic pain associated with stress, to improve sleep in soldiers in combat zones, and to lessen preoperative anxiety in children with cancer. In the past few years, low-cost, portable biofeedback devices have been developed that work with smartphones and tablets. (Emwave2, BioZen, and Quantum Life are examples.) This is perhaps the easiest and most accessible way to learn biofeedback.

STEP 7: ACTION SUMMARY

- Make stress management a high priority.
- Reduce the amount of stress you experience.
- Mitigate the harmful effects of stress you can't avoid.
- Practice regular stress management techniques like meditation, mindfulness-based stress reduction, yoga or biofeedback.



STEP 8:

Supplement Wisely

In a perfect world, none of us would ever need to take supplements. We'd be able to meet all of our nutritional needs through food, our sleep would be deep and restful, we'd get plenty of exercise, we'd live in a pristine environment without chemicals and toxins, we'd have minimal amounts of stress, we'd live in a tight-knit community with close, meaningful relationships and we'd have plenty of time for leisure and fun. We would have been born naturally to a mother that was equally healthy, been breastfed exclusively for 2 years, ate a “real food” diet throughout our entire childhood and never taken antibiotics.

Raise your hand if this describes your life. If you've got your hand in the air, you can probably stop reading this and skip to Step 9.

But if you're like the rest of us, this doesn't describe your life. You don't sleep as much as you'd like. You're stressed out. You work at a desk and even though you go to the gym a few times a week, you know sitting all day isn't healthy. You live in the city and you're exposed to chemicals and toxins every day. Your mom had autoimmune disease and it looks like she passed those genes down to you. Or maybe you were born via c-section and/or not breastfed, or you took antibiotics for acne as a teenager, and now your gut is screwed up. Unfortunately, this is not unusual. It's the rule, rather than the exception.

A clean diet is the best possible starting place, but it's not always enough to solve chronic health problems. This is where supplementation can be extremely valuable.

There are two kinds of supplementation: maintenance and therapeutic. Maintenance supplementation involves supplementing with basic micronutrients that may be difficult to obtain enough of even in the context of a healthy diet. Examples might include vitamin D, vitamin A, EPA and DHA, protein powder, and probiotics.

Therapeutic supplementation is designed to accomplish a specific goal, such as treating a particular health condition or addressing a specific symptom, like insomnia.

Therapeutic supplementation is beyond the scope of this eBook because it largely depends upon your individual circumstances: your health status and the problems you're trying to address.

Instead, let's discuss maintenance supplementation because although the maintenance supplements that are appropriate for you will also vary based on your circumstances, there are some common guidelines I can share that will help you to choose.

Which nutrients should you consider supplementing with?

Vitamin A (retinol)

Vitamin A is important catalyst for a variety of biochemical processes in the body. It's required for assimilation of protein, minerals and water-soluble vitamins, and it also acts as antioxidant, protecting the body against free-radical damage and diseases like cancer. Vitamin A plays a crucial role in reproduction, promoting full-term pregnancy and the proper development of the face (eyes, nose, dental arches & lips).

The RDA for vitamin A (2,600 IU) is woefully inadequate, and even then, over 25% of Americans consume less than half of the recommended amount. Native populations such as the traditional Inuit—which were free of modern, degenerative disease—got much more vitamin A than the average American. The Greenland Inuit of 1953, prior to much contact with the Western world, got about 35,000 IU of vitamin A per day.

Vitamin A (retinol) is only found in significant amounts in organ meats, which explains why many Americans don't get enough. If you follow my recommendations in Step 2: Nourish Your Body, and you do eat organ meats (especially liver), you're probably getting enough vitamin A and thus don't need to supplement. However, if you're like most Americans and you've never eaten liver in your life (and don't plan to start), you may benefit from supplementing with A.

There's been a lot of discussion in the media about the toxicity of vitamin A. Some

researchers and doctors now recommend avoiding cod liver oil because of this concern. Even Dr. Mercola has jumped on the “vitamin A is toxic” bandwagon. But is this true?

It is true that vitamin A is potentially toxic. Some evidence suggests that excess vitamin A increases the risk of osteoporosis. For example, one study showed both low and high serum vitamin A carried double the risk of fractures as did optimal levels.

But if we dig deeper we find that excess vitamin A only causes problems against a backdrop of vitamin D deficiency. In his excellent article [Vitamin A on Trial: Does Vitamin A Cause Osteoporosis?](#), researcher Chris Masterjohn summarizes evidence demonstrating that vitamin D decreases the toxicity of and increases the dietary requirement for vitamin A. Studies show that supplementing with vitamin D radically increases the toxicity threshold of vitamin A. In a hypothetical 160 lb. person, vitamin D supplementation increases the toxicity threshold of vitamin A to more than 200,000 IU/d. You’d have to eat 22 ounces of beef liver or take 5 TBS of high vitamin CLO each day to get this amount. Not likely!

To meet vitamin A needs (assuming you’re not up for eating organ meats), I recommend taking high vitamin cod liver oil (CLO) to provide a dose of 10-15,000 IU per day. Cod liver oil is really more of a food than a supplement, but since it’s not a normal part of people’s diet we’ll consider it as a supplement. CLO is an ideal vitamin A source because it also contains vitamin D, which as we just learned, protects against the toxicity of A.

But not all cod liver oil is created alike. It’s important to choose a brand that contains the naturally occurring vitamins, rather than synthetic vitamins added after the fact. How the cod liver oil is processed is also important; it contains fragile fatty acids that are susceptible to damage by heat, so it’s best to choose a brand that uses fermentation or another cold-processing method. I’ll tell you which specific product I recommend to my patients at the end of this section.

Vitamin D

Much has been written about the need for and benefits of vitamin D supplementation over the past several years—and with good reason. It's critical for health and up to 50% of Americans are deficient.

We can get vitamin D from two sources: food and sunshine. Seafood is the only significant source of vitamin D, but you'd still have to eat a lot of it to get enough. 8-9 ounces of herring provides about 2,000 IU of vitamin D, which is the minimum daily requirement for most people to maintain adequate blood levels.

Sunlight converts a precursor called 7-dehydro-cholesterol in our skin to vitamin D3. This D3, along with the D3 we get from food, gets converted by the liver into 25-hydroxy-vitamin D (25D), which is what typically gets measured when you have a vitamin D test. The optimal 25D level is somewhere between 30 and 50 ng/mL. Contrary to what some researchers and doctors have recommended, there's no evidence that raising blood levels of 25D above 50 ng/mL is beneficial, and there's some evidence that it may cause harm. Studies show that bone mineral density peaks at 45 ng/mL and then falls again as 25D levels rise above 45. Other studies have shown that the risk of kidney stones and CVD increase with high 25D levels due to the elevated serum calcium levels that accompany excess vitamin D.

However, we also know that vitamin A and vitamin K2 protect against vitamin D toxicity, and vice versa. As I explained in the vitamin A section, fat soluble vitamins exist in a synergistic relationship. It's possible that the people in the studies above that experienced problems with excess 25D levels were deficient in vitamin A or K2, or both. This is why it's so important to supplement with all of the fat-soluble vitamins together.

What about sunlight? Well, in summer mid-day sun with pale skin, 30 minutes of direct sunlight will produce 10–20,000 IU of vitamin D. But this is a best-case scenario. With darker skin, or different times of year, or buildings that block the sunlight, or increased time spent indoors, we won't be producing that much. It's also true that aging, overweight, and inflammation reduce our conversion of sunlight to vitamin D. This is why sunlight alone isn't normally a sufficient source of vitamin D.

With this in mind, most people should supplement with D. The amount needed to maintain blood levels of 30-50 ng/mL varies depending on some of the factors I've

listed above, but in my clinical experience it's usually somewhere between 2,000–5,000 IU in the winter and anywhere from no supplementation to 2,000 IU in the summer. However, this will vary depending on your skin tone and where you live. That's why it's important to test your 25D levels first, then begin supplementation, and then re-test a few months later to determine the correct maintenance dose.

As with vitamin A, the best source of vitamin D is high-vitamin cod liver oil. It contains not only vitamins A & D, but also natural vitamin E and other quinones.

Magnesium

There are few compounds in the body more important to overall health than magnesium. Over 300 enzymes need it, including every enzyme associated with ATP, and enzymes required to synthesize DNA, RNA, and proteins. Magnesium also plays an important role in bone and cell membranes, as it helps to transport ions across the membrane surface.

Studies show that most Americans don't get enough. The median intake across all racial groups is far below the RDA, which is 420 mg/d for men and 320-400 mg/d for women. Although half of Americans take a multivitamin daily, most don't contain enough magnesium to make up for the shortfall.

Magnesium is also difficult to obtain from food. Nuts and seeds are the highest source, but they also contain phytic acid, which inhibits magnesium absorption. (This can be addressed, at least to some degree, by soaking the nuts and seeds for 18 hours, and then roasting or dehydrating them prior to consumption). Another issue is that magnesium levels in food have dropped as modern soils have become increasingly depleted. What this means is that if you're not supplementing with magnesium, you're probably not getting enough.

And magnesium deficiency is no small thing. It has serious—even fatal—consequences. It produces symptoms like muscle cramps, heart arrhythmias, tremor, headaches, and acid reflux, and it's associated with CVD, hypertension, metabolic syndrome, diabetes, migraines, PMS, asthma, and hypothyroidism. In fact, it's hard to find a modern disease that magnesium deficiency isn't associated with.

Because of this, I think most people would benefit by supplementing with magnesium. Intake of 500–600 mg/d from a combination of food and supplements is an optimal range to shoot for. Since most people get less than 250 mg/d from food, a dose of 250–350 mg/d in supplement form is ideal. I recommend using chelated forms of magnesium like glycinate and malate because they're better absorbed and tend to have fewer side effects.

EPA & DHA

EPA and DHA are omega-3 fats found primarily in cold-water fish like salmon, mackerel, herring, sardines, anchovies, and halibut.

EPA and DHA play an important role in fetal development, cardiovascular and immune health, weight management, cognitive function, and much more. Low intake of these important nutrients has been associated with a wide range of health problems, including:

- Depression and bipolar disorder.
- Heart disease.
- High blood pressure.
- High cholesterol.
- Autoimmune diseases like rheumatoid arthritis and lupus.
- Behavioral disorders like ADHD and autism spectrum disorder.
- Infections like chronic hepatitis.
- Cognitive disorders like Alzheimer's and Parkinson's.

It's possible to meet EPA and DHA needs by eating about 12–16 ounces a week of cold-water, fatty fish (such as those I listed above).

However, if you're not eating this much of these types of fish, it's a good idea to supplement so that you obtain approximately 500–1,000 mg/d of EPA and DHA combined.

Again, I think cod liver oil is a good choice, because it not only contains EPA and DHA, it also contains fat soluble vitamins like vitamin A and D.

Probiotics

Probiotics (“pro” = for, “biotic” = life) are live microorganisms that are beneficial to humans. Studies suggest that consuming probiotic organisms have a wide range of positive effects, including reducing inflammation, treating diarrhea and constipation, improving the immune system, minimizing or reversing lactose intolerance, and even reducing anxiety and improving cognitive function.

For some people, consuming fermented foods (which are rich in probiotic bacteria) on a daily basis will be enough to restore and maintain healthy gut flora. However, for those that have significantly compromised gut microbiota due to a history of antibiotic use, poor diet, intestinal infections, or conditions like IBS or inflammatory bowel disease, supplementing with additional probiotics may be necessary.

There are many choices when it comes to probiotics. However, the best probiotics will meet these seven criteria:

- It should survive the passage through the stomach and thrive in the large intestine.
- It should contain a broad spectrum of microorganisms.
- It should be effective for both constipation and loose stools or diarrhea.
- It should be safe to take when conditions like small intestinal bacterial overgrowth (SIBO) are present.
- It should be shelf-stable (i.e. doesn't require refrigeration, maintains potency over time).
- It should be backed by peer-reviewed, published clinical studies.
- It should be gluten- and dairy-free.

Many commercially available probiotics do not meet all of these criteria. For example, only a small percentage of *Lactobacillus* and *Bifidobacterium* strains (which are among the most commonly used probiotics) are viable in the presence of stomach acid and bile, and thus have a chance of making it to the large intestine where they belong.

Many probiotics require refrigeration, which makes traveling with them difficult, or lose potency quickly. Other products are effective for diarrhea, but can make constipation worse. And many probiotics that are sold in stores or online have little research behind

them. This probably explains why studies have found that most probiotics do not cause substantive changes in the quantity or number of species of gut bacteria.

In general, I favor probiotics that contain soil-based organisms (SBOs). These are particular species of microflora found in the soil that humans have been exposed to throughout the vast majority of our evolutionary history. Unfortunately, changes in the soil after the industrialization of agriculture and differences in food handling have decreased our exposure to these important symbiotic organisms. SBOs are typically strains found in the human gut (such as *Bacillus* species), they survive the passage through the gastrointestinal tract and are adapted for colonization of the gut (because they are normal residents), and they exist in lower concentrations than *Lactobacilli* and *Bifidobacterium* (and are thus easier to influence via supplementation). Soil-based organisms have been shown to be effective for IBS, diarrhea, constipation, and other digestive conditions in randomized, placebo-controlled trials—including one trial that lasted for a year, which is an exceptionally long period for a probiotic study.

Another reason I prefer soil-based organisms is that they are safer and more effective for patients with small intestinal bacterial overgrowth (SIBO)—a condition which many people with gut issues have. SIBO often involves an overgrowth of bacteria that produce D-lactic acid, such as *Lactobacillus acidophilus*. If you have SIBO and you take a probiotic with *L. acidophilus* in it (which the majority of commercial probiotics do contain), it could worsen your condition. Many of my patients with gut issues are surprised when they have adverse reactions to probiotics, since they are so universally regarded as helpful. This is often the explanation for their reaction.

Finally, I've found that soil-based organisms tend to work well for people with both constipation and diarrhea, whereas many typical commercial probiotics can make constipation worse.

The best approach with probiotics is to take a “broad spectrum” blend that contains species from all four of the phyla found in the human digestive tract, including Firmicutes, Bacteroidetes, Actinobacteria and Proteobacteria. As a result of the Human Microbiome Project, we now know that the gut contains thousands—rather than hundreds—of microbial species. This underlines the importance of a multi-strain product that contains many different genera of bacteria that are capable of colonizing the human gut.

Protein

Most people in the US get enough protein without supplementing. However, there are certain groups of people that may benefit from supplementing with additional protein.

High protein intakes can be effective for:

- Improving performance and recovery for athletes.
- Weight loss.
- Stabilizing blood sugar.
- Helping with tissue regeneration in people with injuries or chronic illness.
- Improving stress tolerance and “adrenal fatigue.”

Sometimes simply increasing your intake of animal products like meat, fish, eggs, and dairy is enough to meet your protein needs. However, in some cases this isn't a viable option. For example, you might have trouble digesting too much meat, or maybe you simply don't want to eat animal products three times a day.

Unfortunately, plants are much lower in protein, and the protein they do contain is much less bioavailable than animal protein. This means that plant protein sources like hemp and pea are not a great choice.

Whey protein powder is one of the most popular ways to supplement with protein, and can be a great option. Unfortunately, whey tends to cause bloating and discomfort in a significant number of people—especially those with dairy sensitivity.

The protein powder I recommend to patients, and the one I use myself, is made from hydrolyzed hormone- and antibiotic-free beef. When a protein is hydrolyzed it means it is partially “digested” or broken down, which increases its bioavailability and absorption. In fact, the particular product I use is even more bioavailable than whey protein.

I like the beef powder because it is well-tolerated by most people and can be safely used by those with dairy sensitivities (unlike whey). And in case you're wondering, it doesn't taste like beef! It has a pleasant sweet flavor that mixes well with almond milk or fresh vegetable juice.

Those are the basic maintenance supplements that I think are worth considering. As you may have gathered, there are several important considerations when choosing the right product in each case. I've provided the criteria above if you'd like to source them yourself. But I know that many of you are busy and don't have time to do that kind of research.

The good news is I've already done this legwork, and I continue to review new options as they become available. If you'd rather just use the same products that I use myself and prescribe to my patients, you can purchase them from my online store using the links below:

- [Fermented Cod Liver Oil / Butter Oil Blend](#) (excellent source of vitamins A & D, and EPA and DHA).
- [Magnesium glycinate](#) (a highly absorbable form of magnesium).
- [Prescript Assist](#) (a soil-based organism probiotic).
- [PurePaleo](#) (a unique protein powder free of dairy, gluten, grains, legumes and GMOs).

STEP 8: ACTION SUMMARY

- Consider supplementing with vitamin A, vitamin D, magnesium, EPA and DHA, probiotics, and cod liver oil—depending on your diet, circumstances and goals.

A close-up photograph of a woman with dark, curly hair, smiling broadly and showing her teeth. She is wearing a dark-colored top. The background is slightly blurred, suggesting an outdoor setting with greenery.

STEP 9:

Practice Pleasure

In Step 7: Manage Your Stress, we talked about how chronic stress contributes to everything from insomnia and anxiety to obesity and heart disease.

Scientists have devoted vast amounts of attention to understanding the mechanisms of the “fight or flight” response. We know that when we’re faced with stress, a cascade of physiological changes occur triggered by stimulation of the sympathetic nervous system: blood flow increases to the muscles, lungs and other areas needed to mobilize us for action, and decreases to areas like the digestive and reproductive system that aren’t necessary for immediate survival. Hormones like adrenaline pump through our body to make us stronger and faster. Extra fuel (glucose) is released from the liver so that it can be burned quickly for energy.

But there’s another nervous system response that’s just as important as fight or flight to our survival that’s often ignored in the scientific literature and in mainstream articles about stress. We’re not only set up to deal with stress or challenges, but also to enjoy life, to relax, to bond, and to heal. This is the parasympathetic state, often referred to as the “rest and digest” or “calm and connect” response. It has the opposite biochemical effects on our body to “fight or flight.” Our heart rate and respiration slow down, our blood pressure drops, our blood flow increases to the digestive tract, skin and reproductive organs, and our stress hormones decrease.

We’re not built for chronic stress

Both fight or flight and calm and connect are essential to life. We need the ability to meet challenges and mobilize our physical and mental resources to take action. But we also have the need to digest food, replenish our stores, and heal ourselves.

In paleolithic times, it's likely these two different systems existed in a state of relative balance. Imagine a day of mostly relaxing, interacting with others, gathering food or building shelters. This might be punctuated by an acutely stressful event, such as a hunt or an encounter with a predator. But it would likely be followed again by more "rest and digest" time, such as gathering around a fire and feasting on the day's hunt. Human beings have adapted to this kind of balance between pressure and calm, stress and relaxation, sympathetic and parasympathetic stimulation.

But today things are different. Fight or flight isn't usually a temporary situation – like warding off immediate physical danger or engaging in a hunt – that quickly passes. Instead it's an almost continuous reaction to the excessive demands placed on us by modern life. Worrying about your 401k plan, watching the news, being skipped over for a promotion, getting cut off in traffic... while these don't literally threaten our survival, our bodies react as if they do.

The problem is that chronic stress impacts us in much the same way that acute stress does. We have the exact same physiological response – only to a lesser degree. Our heart rate and blood pressure increase, stress hormones start pumping, and blood flow to the digestive and reproductive organs decreases. Is it any wonder that conditions like IBS and infertility have become epidemic?

When fight or flight is no longer simply an acute mobilization of our body's resources, but instead becomes our default physiological state, we're in a state of chronic stress. And as you saw in Step 7, chronic stress wreaks total havoc on our bodies.

Pleasure: the antidote to chronic stress

In their book *Feeling Good Is Good For You*, researchers Carl J. Charnetski and Francis X Brennan set out to review the emerging evidence that pleasure can boost our immune systems and lengthen our lives. According to the authors:

In every way, stress is the antithesis of pleasure. It jangles your nerves, juggles a whole host of your body's hormones, elevates your blood pressure, and makes your pulse race... It

also weakens your immune system's ability to resist illness and disease.

If stress is the antithesis of pleasure, then it follows that pleasure is the antithesis of stress. So the best way to fight stress is with pleasure.

Our bodies secrete chemicals called endorphins when we experience pleasure. Animal research has revealed, for example, that endorphin levels are up to 86 times higher after animals experience multiple orgasms! But endorphins are also released, albeit at lower levels, in more mundane daily activities such as playing with a pet, watching a funny movie, listening to our favorite music, visiting a favorite place or connecting with loved ones.

The chemicals released when we experience pleasure do more than counteract stress hormones and improve mood. They also:

- Improve immune function by producing an antibacterial peptide.
- Enhance the killer instincts and abilities of various immune components, including B cells, T cells, NK cells, and immunoglobulins.
- Enable certain immune cells to secrete their own endorphins as a way of improving their disease-fighting capacity.

The persistent state of chronic stress in our lives makes the counter-balancing effects of pleasure even more important. This is especially true for anyone dealing with chronic illness or pain, which are both stressors on the body.

Pleasure vs. distraction: not the same!

It might seem strange to you that I'm recommending seeking more pleasure in life. Maybe you're thinking, "Our entire culture is slavishly devoted to and obsessed with the hedonistic pursuit of pleasure! And you want more?"

But I'd disagree with that assessment. Our culture is devoted to distraction, not pleasure. And there's a big difference between the two.

Distraction is something that prevents us from giving full attention to ourselves and our lives. Pleasure is almost exactly the opposite. When we experience pleasure we are more fully present to life, more grounded in our bodies, more alive and aware. Pleasure activates our calm and connect system; distraction does not.

For example, watching TV and browsing the web are often distractions that divert our attention from our own experience. But getting a massage, listening to our favorite music or taking a walk barefoot on the beach are pleasurable activities that connect us more deeply with ourselves and the world around us.

It is this experience that is crucial to our health and—I would argue—our happiness. But does that mean there's never a role for distraction? No. I believe distraction (when used consciously and wisely) can be a helpful and sometimes even a necessary way of releasing the pressure valve or hitting the reset button. Sometimes we're too stressed out, too sick or in too much pain to experience pleasure or to figure out how to bring it into our lives in that moment.

In these moments distraction can be a gift. In fact, the Zen teacher and author Darlene Cohen had a special name for this kind of distraction: "down-and-dirty comfort". She described it in her book *Turning Suffering Inside Out*:

How do we live through unbearable situations like a catastrophic disease without being destroyed? How do we deal with the mundane anguish of our everyday lives? How do we continue to live under crushing stress? And even further, how do we not just get through these things but have rich, full and worthwhile lives that we actually want to live—under any circumstances?

The important thing to understand here is that pleasure and distraction both have a role to play in protecting us from the ravaging effects of stress. Most people these days are pretty good at distraction. In fact, distraction has become a national pastime. What we're not so good at is pleasure.

5 ways to bring more pleasure into your life

Here are 5 scientifically proven ways to cultivate more pleasure in your life:

- Music (listening to it or making it)
- Touch (including massage, sex, and simple human contact)
- Pets
- Humor (laughter)
- Light, sight, and insight (spending time outdoors, prayer/meditation, and positive attitude)

Most of us are already aware of the healing power of those things listed above – at least on some level. But in this culture there is also an overwhelming reliance on medicine, surgery, diet, and other physiological interventions to treat disease. Though we may pay lip service to the idea that stress causes illness and pleasure can prevent it, how many of us actually attribute the same importance to listening to music or watching a funny movie as we do to taking a pill? The evidence is crystal clear now that our thoughts, beliefs, emotions, and behavior are all capable of inducing the same physiological changes in our bodies as foods, supplements, pills, and even surgery are.

If you doubt that this is true, consider the placebo effect. It has been proven over and over again that pharmacologically inert substances like sugar pills can have identical or even greater therapeutic effects than drugs in certain cases. Even more impressive are the trials that have shown that sham surgery (when small incisions are made to convince the patient they have had the operation, but no surgery is performed) is at times as effective as the actual surgery.

Clearly this points to the power we all have to heal ourselves. If only the suggestion or belief that we will heal is enough to induce the physiological changes that lead to healing, without the presence of any “active” pharmacological substance or surgical intervention, then clearly our thoughts, beliefs, and emotions have the potential to be powerful medicine.

STEP 9: ACTION SUMMARY

- Make pleasure a priority.
- Make a list of activities you find pleasurable.
- Do at least one of the activities on your list each day.

Wrapping up

If you follow the steps I've outlined in this eBook, I can virtually guarantee that you'll be closer to achieving your health goals, whatever they are.

But this is just the beginning. In the weeks to come, I'm going to help you specifically address the #1 concern you expressed when you joined this community. I'm also going to help you identify other underlying issues (some of which you may not be fully aware of) that could be standing in the way of you feeling your best.

I hope you've enjoyed this book and it serves as a catalyst for your transformation and growth!