What your doctor isn't telling you

Change Your Life One Bite, Breath, and Step at a Time

Inger Pols

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Change Your Life One Bite, Breath, and Step at a Time

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Preface

Do you know that some scientists are now predicting the first sustained drop in life expectancy in modern times?

As residents of one of the wealthiest countries in the world, with access to the best in medical care, we are used to seeing life expectancy numbers continually increasing. We fully expect that with continued advances in research and technology, our kids will live even longer and healthier lives.

As a parent, the idea that my kids may not live as long, or as well, as my generation is deeply disturbing.

If that occurs, it will not be for the lack of scientific advancements. Rather, it will result from completely preventable lifestyle choices. The food we are eating is not only not keeping us well, it is making us sick. The stress in our lives is wreaking internal havoc. Our sedentary lifestyle is impacting our physical bodies in more ways than just weight gain.

Many of the same issues that make health care a broken business system are breaking down systems inside of our bodies.

But the good news is that it is not too late: we can make changes today that will improve our tomorrow. And that of our children and grandchildren.

How do I know this? I have experienced it.

In 2001, I embarked on a life-changing journey; I adopted a four-year-old boy from Kazakhstan. Seeing the run-down orphanage where he lived—with no toilets, just holes dug in the concrete floor for a latrine, eating gruel for dinner, drinking and bathing in brown water—was an unforgettable experience.

A year later, I traveled to Siberia to bring home a three-year-old girl. While her living conditions were much better than her brother's, her nutrition was still limited. Admiring beautiful strawberry plants in the orphanage garden, I asked if my daughter liked strawberries, as we had a pick-your-own strawberry field in our town. I was shocked to hear that the strawberries were grown for the workers

and that the children's diet was kept simple to avoid allergic reactions.

Introducing my kids to new foods was an amazing experience. Neither had ever had hot or a cold food before, so they needed to acquire a taste for ice cream and food had to cool down to room temperature before they would eat it. My daughter found comfort in the blandness and continues to prefer a carb-heavy diet without spice or exotic flavors.

My son is exactly the opposite: he seeks flavor stimulation and enjoys spices and hot sauce—his favorite food is Caesar salad with anchovies. Sharing this experience with them changed my relationship with food. I realized good food is more than just nutrition; it's nourishment on every level. It's healing. It's love.

At first, I accepted the poor nutrition my children had received in utero and for the first few years of their lives as something I could not change. My four-year-old son was the size of an 18-month-old when he came home. But as he began to eat and grow, I became more and more curious about how I might help him overcome his challenging start.

I began to research nutrition and dietary theory and found extensive information indicating that it was not too late to change his development, that new neural pathways could be created, and good nutrition could not only prevent health challenges in the future, but also reverse conditions already present. I knew at that moment that I would devote myself to learning all that I could to help my kids thrive going forward.

I already had a solid educational foundation, with an undergraduate degree from Yale University and a Masters in Business Administration from the Columbia Business School. The time I had spent in the corporate world honed my writing, research and problem solving skills. But I needed to learn more about wellness.

So I went back to school. I attended the Institute for Integrative Nutrition in NYC -- in conjunction with Columbia University's Teachers College – to study nutrition and dietary theory and received certification as a Holistic Health Counselor. I studied to become a Holistic Stress Management Instructor, became a certified Personal Trainer in addition to already being an indoor cycling coach for more than ten years, worked with energy medicine and healing systems, and created

an online health course on Cholesterol and Heart Health at www.bootcampsforlife.com.

I also read everything I could get my hands on, talked to physicians, naturopaths, healers, and researchers to learn all that I could. I invested in classroom training, but my voracious quest for knowledge was not contained by formal classroom educational initiatives. I researched and investigated independently and continue to do so today. And I integrated my work experience with my new passion.

I led the marketing at a women's wellness company focused on natural healing and I learned first-hand from the pioneers of alternative women's health that originally included Dr. Christiane Northrup. I also served as the founding Editor of the New England Health Advisory. At NEHA, though my stay was brief, my passion for sharing my knowledge was great. I wrote several dozen articles about health and wellness and answered numerous questions from readers trying to discern how best to improve their daily health choices. Some of those articles, along with new and additional information, now comprise this book.

Over the years, I have invested a lot of time and energy into breaking through the misinformation and the conflicting research that is out there in order to get to the truth, and I am thrilled to be able to share what I have learned with you now. I have analyzed the research, made it accessible to the layperson and have written this book in "shirt-sleeve" English.

The pages that follow contain the information your doctor would be telling you had he or she studied nutrition and dietary theory, stress management, fitness and personal training, and natural medicine. Unfortunately, those topics are not typically taught in medical school. Doctors are trained to combat disease and to alleviate symptoms. But wellness is more than the absence of disease. It is a state of health, vitality, joy and ability. Wellness is not a moment in time: it is a state of being and a series of choices that defines our lives.

Sir Francis Bacon said that knowledge is power. It is my mission to share my knowledge to empower you to live a better life: a longer, happier and healthier life. I am excited that you have chosen to join me by purchasing this book and I am confident that within the pages that follow, you will find helpful information

that you can use to make better wellness choices each and every day of your life.

To your wellness and health: your true wealth!

Inger Pols

Email questions or comments to inger@ingerpols.com

Join my mailing list at www.ingerpols.com and receive a free pdf version of the sugar chapter to share with family or friends.

The Truth About Sugar: It's Not all Equal

Everyone knows that excess sugar causes weight gain. But sugar also

- Feeds cancer cells
- Increases the risk for Alzheimer's
- Increases systolic blood pressure
- Significantly raises total cholesterol, triglycerides, and bad cholesterol and decreases good cholesterol
- Can cause appendicitis, gallstones, and hemorrhoids
- Weakens vision

And that's just the tip of the iceberg! Sugar can impair the structure of your DNA as well the normal regulation of many of the systems of your body. It also inhibits vitamin and mineral absorption. Sugar impacts our health in so many ways that Nancy Appleton wrote a book called "Lick the Sugar Habit," that discusses 76 ways sugar can harm your body!

It's no secret that we are consuming more sugar than ever before. According to diet surveys by the USDA, the average American eats 20 teaspoons of added sugar a day. That does not include sugars naturally found in fruits and milk! At an average of 142 pounds of sugar per year in the typical Western diet, the truth is, sugar is the lynchpin to the nutritional changes we need to make.

We can prevent the health challenges that will diminish our quality of life and shorten our life spans if we stop consuming so much sugar.

If you have struggled with weight gain, obesity or diabetes and have felt frustrated that even with exercise, you have not seen the results, there is hope.

Your diet may actually be preventing your brain from receiving the signal that you are full.

Unlike many food substances we consume that we know aren't good for us, sugar isn't made in a lab and doesn't have a long chemical name. Sugar, we are

told, is natural. There may be no other ‘natural’ substance we consume that does so much damage within our bodies. There are, however, some truly natural alternatives that we can use to add sweetness to our diets that do not cause as much harm.

This chapter will help you determine this all-important question: Is all sugar created equal?

Studies have shown that it matters what form the sugar takes, what the sugar’s source is, and that not all sugars react the same way inside our bodies. This chapter will help you weed out the bad sugars and give you some healthier alternatives.

Glucose and Fructose

To help you understand the difference between glucose and fructose and more importantly, why it matters, I have to cover a little science. Bear with me and I’ll try to keep it simple and brief.

Glucose and fructose are two of the most common forms of sugar. They are both simple sugars and they have the same molecular form. But they have a different structure and as a result, they are metabolized very differently in the body.

One recent study followed participants for only 10 weeks. During the study, 25% of the participants’ energy requirements came from consuming either glucose or fructose sweetened beverages. The weight gain of both groups was comparable. But the group that consumed the fructose drinks gained measurably more intra abdominal fat, or the fat that forms around the organs in the abdomen. This fat has been shown to be a risk factor for many chronic illnesses.

The fructose group also developed insulin resistance. In other words, they became less sensitive to insulin, the hormone whose job it is to control blood sugar levels through the release of glucose into the blood. Insulin resistance can lead to metabolic syndrome, which has been shown to increase the risk of heart

attack among other things. And metabolic syndrome is the precursor to type II diabetes.

A number of studies have now revealed significant health differences between the consumption of glucose and fructose so let's look at the differences.

Glucose

Glucose is the basis for all cellular energy. Since every cell in your body uses glucose, when you consume any glucose, your body utilizes it almost immediately. If you consume 120 calories of glucose, less than one calorie will be stored as fat because the rest essentially gets 'burned up.' Because it's typically broken down in the cells, only a small amount of glucose will need to be broken down by the liver, the organ that performs carbohydrate metabolism and detoxification (among other roles.)

Fructose

As mentioned above, despite having the same molecular formula, fructose has a very different structure. As a result, they are metabolized very differently. Unlike glucose, which is metabolized in the body's cells, fructose is metabolized completely by the liver just like ethanol -- a known toxin -- according to Dr. Robert Lustig, Professor at the University of California at San Francisco Medical School.

Metabolism in the liver also creates by products that pose health challenges, especially if the liver is working hard all day. Some of the by products include toxic waste and uric acid (which raises blood pressure and can lead to gout.)

Because our liver has so many important jobs, it can get overloaded and burn out; since we cannot live without it, the fewer burdens we place on our livers, the better. Given the choice between glucose and fructose, it's definitely better for our bodies to consume glucose, which can be processed predominantly in the cells of the body, over fructose since fructose taxes our livers.

In addition, there are several connections between fructose and fat. Remember that when we consume 120 calories of glucose only one is stored as fat. But when we consume 120 calories of fructose, 40 of those calories will be stored as fat! When it is metabolized, fructose is turned into free fatty acids, VLDL (the bad cholesterol), and triglycerides, which are stored in the body as fat.

The fatty acids also form fat droplets, which can accumulate in your liver and skeletal muscle tissues. These fat deposits can lead to non-alcoholic fatty liver disease and result in insulin resistance. Fructose is a carbohydrate that is metabolized in the body like a fat so no wonder it impacts our weight and our health so dramatically.

But there is another interesting and important difference between glucose and fructose and it lies in cell communication and hormonal balance. **Fructose can interfere with leptin signals, which can lead to overeating. Leptin is the hormone that tells your brain you're full and suppresses your appetite. If the leptin signal is not sent or received, your brain does not get the message you are full, and you will continue to eat.**

Glucose, on the other hand, not only stimulates leptin so your appetite is suppressed and it also helps to suppress the hunger hormone ghrelin.

This may be a big piece of the obesity epidemic, as consuming too much fructose means that leptin signals are being disrupted and the messages to the brain are not getting through.

For some people, their inability to lose weight is not about more exercise or self-discipline; it's a physiological condition that results from too much fructose in their diet. This fructose overload is disrupting hormone signaling and preventing the brain from receiving the message to stop eating because you are full.

Fructose is not inherently bad. If we consume small amounts from fruits and vegetables throughout the day as our ancestors did, we might derive about 15 grams of fructose from our daily diets. This fructose would also be consumed along with the vitamins, minerals, antioxidants and fiber contained in the fruits and vegetables, which would also help to balance out the sugar intake.

But if we increase our fructose consumption exponentially, as we have in recent years, with current estimates that a typical teenager takes in 73 grams a day just in sweetened drinks alone, it's not hard to see how this could pose metabolic challenges to our bodies.

Simple vs. Complex Carbohydrates

Simple carbohydrates, such as alcohol, non-diet soft drinks, fruit and fruit juices, sweets and table sugar are quick energy resources after physical activity, but cause a rapid spike in blood sugar levels and a subsequent crash. Over time, this repeated pattern could impact our body's ability to regulate blood sugar levels and lead to insulin resistance and other concerns. This is another reason why consumption of sweetened drinks such as soda, juice and chocolate milk can be so troublesome.

Complex carbohydrates come from starch and are processed more slowly resulting in less impact on blood sugar levels. Whole grains, nuts, beans and legumes are good complex carbohydrate sources.

The only difference between consuming simple and complex carbohydrates is the time it takes for the glucose to be released into the blood, so unless you are recovering from an intense effort, it is better to choose complex carbohydrates over simple ones as your glucose source.

Moderate amounts of fruits and vegetables however generally have benefits that override their sugar impact. To minimize the blood sugar impact of vegetables and especially fruits, try to eat fruits and vegetables in combination with healthy fats, proteins and fiber. When possible, select fruits and vegetables that are lower on the glycemic index. (The glycemic index can be found readily online and ranks carbohydrates according to their effect on blood glucose levels.)

And while we are not talking specifically about diabetes in this report, there is extensive research that indicates that high sugar consumption in our diets correlates with a fiber deficiency. Increasing fiber in tandem with

diminishing sugar consumption appears to be an effective strategy to offset type II diabetes. There is even a new index called the Sugar-Fiber index (much like the glycemic index) that balances sugar content against the fiber content in the foods that we eat so that you can strike a better balance between the two.

High Fructose Corn Syrup (HFCS)

With fructose in its name, it is easy to see that the arrival of high fructose corn syrup onto the food scene is directly connected to our health crisis. Developed in the 1970s to be a cheaper and sweeter alternative to sugar, it has become pervasive in our food manufacturing today, found in ketchup, spaghetti sauce, salad dressing, bread, and just about all processed foods.

But some have argued that it cannot be made the scapegoat in the glucose/fructose debate since high fructose corn syrup has about the same fructose content as traditional table sugar.

Of course, that assumes that we would take in the same amount of sugars and sweetened food without the arrival of high fructose corn syrup and that is just not the case. Because HFCS is cheaper, it has allowed food manufacturers to use it in more products and has allowed the prices of processed foods to come down so that we choose them more often than we did before. (TV dinners used to be a special treat rather than an everyday occurrence.)

In fact, total sugar consumption has doubled since the advent of high fructose corn syrup; we are not substituting high fructose corn syrup for traditional sucrose (white sugar) we are eating just as much white sugar while adding in an equal amount of high fructose corn syrup.

The advent of the low-fat diet craze has strongly contributed to high fructose corn syrup consumption as well. Though we now know that you do not get fat from eating healthy fats (more on that to come in later reports), many people still choose those products. Processed low-fat foods remove most of the flavor and leave food tasting like cardboard. To compensate, sweetness, usually in the form of high fructose corn syrup, is added.

High fructose corn syrup is altering our sugar set points as well: as we eat more and more of it, we seek out more and more sweetness in our diets. At the same time, because it blocks our hormone signaling satiety, we don't know to stop eating and we eat more than we should at each meal or snack.

The USDA estimates that added sugars represent one quarter of the calories in the average American diet and that most of it comes in the form of high fructose corn syrup. **One quarter of our calories from added sugars, not sugars naturally found in milk of fruits and vegetables, mostly from high fructose corn syrup!**

As previously discussed, the body can handle small amounts of fructose, but when we overload our fructose consumption, we place an undue burden on the liver. In today's toxic world, we need to be looking for ways to support our liver, not challenge it further. Not to mention that it is metabolized as fat.

In addition, there are other health concerns about using high fructose corn syrup. Corn syrup is made from genetically modified corn that has been bred to resist disease and grow bigger faster. Eating that corn also means taking in all the genetic permutations that gave it such features. Studies have also found unsafe levels of mercury in high fructose corn syrup.

One big step toward personal health and wellness will come through the elimination of high fructose corn syrup from your diet.

Artificial Sweeteners

Several artificial sweeteners have been developed over the years for those who are looking to reduce sugar in their diets. But much like the revelation that the butter substitute known as margarine is far worse for your health than the actual butter, we are now aware that those sugar substitutes are far worse for your health than sugar itself.

This is an extremely important discussion and but one that is simply too long to cover here. But for now, let me just say that Aspartame, as an example, is

connected to over 92 negative health symptoms and is responsible for 75% of all food additive reaction reports to the FDA. **Bottom line: sucralose (Splenda), aspartame (NutraSweet and Equal), and saccharin (Sweet 'n Low) should NOT be considered safe or appropriate substitutes at any time.**

Sugar Alcohols

Sugar alcohols are neither sugar nor alcohol but rather a combination, as part of their chemical structure resembles sugar and part resembles alcohol. They are actually carbohydrates called polyols that occur naturally in plants. Because they are not fully absorbed by the small intestine, they can be good for diabetics because you don't get the full sugar absorption. However, because they are not fully absorbed, many people can experience diarrhea, gas or bloating. Some people will react to even a small amount, others can handle small doses and can slowly build up a tolerance to higher amounts.

Because of that, they are good for candy and mints in small amounts, (sugar alcohols also do not cause tooth decay), but they are not so good for baking or consumption in larger amounts.

Of the sugar alcohols, xylitol is the best choice. It is sweetest and seems to have the least gastro intestinal impact reports. Using small amounts of xylitol is one option for a natural sugar substitute.

Best options

We all need a little sweetness in our lives and the best choice at the moment is **stevia**, a sweetener from a plant native to Paraguay. It is about 30 times sweeter than sugar, but the body does not metabolize the sweet glycosides so there is no caloric gain nor is there any impact on blood glucose levels.

It has gained popularity of late and is now readily available in most stores. I have been told that the green form is preferable, but it can be hard to find and more expensive than its white counterpart.

One footnote regarding stevia: companies have now begun to alter stevia in order to counter its sometimes perceived as bitter taste. Truvia (made by Coca Cola) and PureVia (made by Pepsi Co) are two forms readily available in the marketplace that taste sweeter than Stevia. Personally, I cannot comment on the taste, as I have never tried either of those. I can, however, comment on some concerns I have about these two products.

Both products contain erythritol (PureVia also contains isomaltulose). Erythritol is a sugar alcohol and sugar alcohols are not all absorbed by the body. While this may seem good calorically, the down side is that because it is not all absorbed, it can cause gas, bloating and diarrhea upon initial consumption or after more substantive doses as we discussed previously. There have been numerous complaints of these side effects associated with these two products.

At the same time, even if your body does not react to the sugar alcohol concern, the truth is we do not know much about the potential effect of these other sweeteners because they are both relatively new. Neither has been well studied, nor are there any studies to monitor the effect of long-term consumption. Some researchers have expressed concerns about potential harm from these ingredients given the large volume many people might ingest based on typical soda consumption levels.

Given all of these considerations, I would stick to pure **Stevia**.

Other Options:

Date sugar, which is not really sugar but rather comes from ground up dehydrated dates, is a great option for baking as a brown sugar or brown rice syrup substitute. It's rich in nutrients and metabolizes slowly but because it doesn't dissolve, it's not good for use in liquids.

Brown rice syrup is a good alternative choice but it tends to dry out baked goods.

Raw organic honey can also be used in small doses. It has the added benefit of homeopathically helping to reduce asthma and allergies, so its other health benefits help outweigh the fact that it is high in fructose.

For small amounts of traditional sugar, if needed on occasion, **organic raw evaporated cane sugar** is your best choice.

Agave nectar has become popular of late, and I used to recommend it. But agave is nearly all fructose, so despite the fact that it has a low glycemic index, it is still fructose. Agave raises all the issues discussed previously and as it offers no unique health benefits to offset the fructose concerns, it should be avoided.

The Truth About Sugar

There is little doubt that we are consuming too much sugar, that sugar wreaks havoc in our bodies and now hopefully after reading this chapter, you know that there is a very important difference between sugars and how they react in our bodies.

Reducing sugar intake overall is an important step to wellness, and targeting fructose is a good place to start.

[If you'd like to learn more about the science behind this, I highly recommend the video of Dr. Robert Lustig, University of California at San Francisco Professor of Pediatrics, Division of Endocrinology called Sugar: The Bitter Truth. You can find it on you tube, but be forewarned that it lasts about 90 minutes and it does get into some pretty detailed science. So pop some organic non-genetically modified (GMO) popcorn first!]

3 Food Additives that are Taking Years Off Your Life

I recently had dinner with a friend who is fit, active, healthy and tries to eat well; he's doing everything right. We got to talking about food labels and marketing claims. He told me that he reads the labels and that he thinks he's making good healthy food choices.

It soon became apparent that he was reading the product claims on the front labels and occasionally, the nutrition facts label, but not the list of ingredients. I challenged him to read the ingredient list on the foods in his cabinets. We pulled out the first item handy, Progresso Bread Crumbs, and I showed him the high fructose corn syrup and trans fats in the ingredient list.

We discovered 95% of the food in his house contained at least one, sometimes two or even all three, of the most harmful food additives: high fructose corn syrup, trans fats and MSG. It was a challenge to find anything in a box, bag, plastic bottle or jar that did not have one of these unhealthy additives, even product labeled as "natural."

Eating whole unprocessed foods is best, so I always recommend you stick to the outside aisles of the supermarket and avoid packaged and processed food. But for many of us, it is simply not possible to avoid all processed foods completely. When you must buy prepared foods, how can you make the best choices?

While it's easy to believe food manufacturers' marketing claims, the only way to know if you're making good food choices and know exactly what you are really eating is to read the ingredient list. Avoiding harmful additives could add years to your life.

Trans Fats or Partially Hydrogenated Oil

New York City made headlines when it banned all trans fats from foods. California then became the first state to do so. Many European countries have done the same, or passed legislation for future elimination. What is it about trans fats that is so concerning? What led the National Academy of Science to say there is **no safe level of trans fat consumption** and to call for a full ban of its use at the city, state and country level?

Trans fats are made when a hydrogen atom is added to unsaturated fat. During this process, hydrogen gas bubbles through the oil in the presence of a nickel catalyst. Originally just an interesting science experiment, the result became attractive to food manufacturers looking to increase profits. Trans fats don't spoil as readily as other oils, they don't break down when heated repeatedly, and they can turn a liquid oil into a solid, which makes transport easier, and offers a cheaper substitute to solid animal fat.

The fast food industry saw the appeal, and almost every major chain found a use: Dunkin Donuts used them to fry donuts and McDonald's used them to fry its french fries. (They and most others have recently eliminated trans fats due to public pressure). Margarine, baked and snack goods sales benefited from increasing concern over the use of butter and lard several decades ago before healthy fats were fully understood and there was a desire to shift to a vegetable-based oil product. But as trans fat consumption increased radically, researchers grew concerned about its effect on health.

Awareness of the harm of trans fats began in the 1990s, though a study done in the U.K. as far back as 1981 raised some questions. In 1993, Harvard concluded that the intake of partially hydrogenated oils increased the likelihood of a heart attack. That study suggested that replacing just 2% of energy from trans fats with healthy unsaturated fats could reduce the risk of coronary heart disease by a third.

In 1999, a joint study by Harvard School of Public Health and Brigham and Women's Hospital reported that "at least 30,000 and as many as 100,000 cardiac deaths a year in the United States could be prevented if people replaced trans fats with healthier non-hydrogenated" oils. The New England Journal of Medicine reported that same year that trans fats are directly linked to the

development of diabetes, cancer and cardiovascular disease.

Today we know that trans fats increase LDL, the low-density lipoproteins, especially the smaller denser particles that we now know are more damaging to the arteries. At the same time, they reduce HDL, the high-density lipoproteins that are responsible for taking bad cholesterol and waste that needs to be returned to the liver for processing and disposal. (For more detail, see the chapter on cholesterol.) They also create inflammation, which has been shown to lead to heart disease, stroke, diabetes and many other chronic conditions. Trans fats have also been linked to obesity and insulin resistance as well as Alzheimer's disease.

At one point, the FDA estimated 95% of prepared cookies, 100% of crackers and 80% of frozen breakfast products contained trans fats. They have also said that the average American consumes 5.8 grams of trans fats a day. While some companies are shifting their manufacturing processes, the majority of foods still contain some amount of trans fat. (It breaks my heart every year when the Girl Scouts come calling because I'd love to support their cause, but their cookies all include trans fats, so typically, I make a donation and tell them to keep the cookies.)

When you eat at bakeries, restaurants, schools and cafeterias there is no way to monitor trans fat presence, so it's likely that you're consuming them. Trans fats do occur naturally in some meat and dairy products, so it's hard to avoid them completely.

The American Heart Association recommends that no more than 1% of your calorie energy come from trans fats. If you eat a 2,000 calorie a day diet, that is 20 calories, or less than two grams of trans fats a day. Given what you likely ingest through your daily meat and dairy consumption, you are most likely reaching or exceeding that amount through natural sources.

Prior to 2006, when it was required to list trans fats on labels, it was hard to tell which foods contained them. Now it's a little easier, but you still cannot depend on truth in labeling with regard to trans fats. In fact, many products claim to be trans fat free while still containing trans fats. Portion sizes under .5g per serving

do not require listing on labels. (In Canada, it's .2g.) So some manufacturers simply reduce portion sizes in order to meet the minimum requirements, but continue to process foods the same way.

The only way to know for sure is to read the label and to look for partially hydrogenated oils on the ingredient list. It may surprise you where you find them: in addition to the obvious breads, cookies and crackers, I found them in a jar of marinated artichoke hearts!

Monosodium Glutamate (MSG)

Almost everyone knows they should avoid MSG, so food manufacturers have gotten smart about hiding it. But it astounds me how many times I see it listed openly as monosodium glutamate in the ingredient list of a common kitchen staple. It's in so many foods because it's a flavor enhancer that leads you to want to eat more, and which is exactly what food manufacturers want.

MSG is a neurotoxin that excites the brain. In addition to being toxic, it's addictive. It can cause brain damage, lead to behavior disorders, learning disabilities, endocrine and reproductive disorders and neurodegenerative disease. It has been shown to lead to obesity regardless of caloric intake; it acts on the pancreas to secrete insulin and stimulate hunger, and if you are taking calcium blockers for high blood pressure, MSG acts as a calcium channel opener, counteracting that medication.

It's in soups, salad dressings and dips, Hamburger Helper, frozen foods, prepared noodles and potato chips, it's the secret ingredient at many big name fast food and chain restaurants, and it's sold as the flavor-enhancing product, Accent. It's not just a Chinese restaurant concern, though it gained attention after many people sensitive to its effects came down with headaches, dizziness and chest pains after eating it in Chinese food.

Glutamic acids are amino acids (the building blocks of proteins) commonly found in foods such as tomatoes, milk and mushrooms. They are also found in our cells and function as a neurotransmitter involved in a variety of brain functions. When

we eat these foods, we break down the natural or sometimes called “bound” glutamic acid and it is delivered to receptors in our brain and body. It’s not harmful and in fact performs a valuable function.

But when glutamic acid is made in a factory, the “bound” glutamic acid in corn, molasses, beets or wheat is broken down by one of several processes: It is hydrolyzed, autolyzed, modified or fermented using powerful chemicals or specially engineered bacterias. (Most of the world’s production is made using bacterial fermentation, often with genetically engineered bacterias, but autolyzed and hydrolyzed processes are rampant in food products as well.)

It then becomes refined into a sugar-like white crystal form that is 78.2% glutamate, 12.2% sodium and 9.6% water. Anything 78%-79% processed free glutamic acid (MSG) will be listed as monosodium glutamate on the label. Other MSG-containing ingredients are listed in their technical form such as hydrolyzed vegetable proteins, autolyzed yeast, hydrolyzed yeast, yeast extract, soy extracts and protein isolate. Labels reveal that these forms are pervasive in the vast majority of foods we buy and eat.

So what’s the difference between the naturally occurring monosodium glutamate and the processed form?

Unprocessed glutamic acid is L-glutamic acid. When the processed version is created in factories, it is both L-glutamic acid and D-glutamic acid, along with pyroglutamic acid and a number of impurities. Several of the impurities such as mono and dichloro propanols and heterocyclic amines are carcinogenic. But even more importantly, our bodies are made to process and utilize naturally occurring L-glutamic acid, not the created D-glutamic acid that results from factory processing.

The FDA considers MSG to be naturally occurring since the basic ingredient is found in nature. But naturally occurring doesn’t mean safe. Arsenic is naturally occurring but you wouldn’t want to eat it. The factory version of MSG causes sensitivities and toxicity in people, as our bodies have never had to process this form before. Look out for all forms of monosodium glutamate including autolyzed or hydrolyzed yeast, yeast or soy extract and protein isolate on your ingredient

lists and avoid them all.

High Fructose Corn Syrup (HFCS)

Because we already talked about HFCS in *The Truth About Sugar* chapter, I'll keep this summary brief.

Research has shown that fructose inhibits our leptin signaling and directly leads to obesity, type-2 diabetes and a myriad of other conditions including heart disease. It alters our sweetness set points and interferes with satiety signals, leading us to eat more. We need to minimize fructose in our diets because fructose cannot be metabolized by the cells and must be metabolized by the liver; excess fructose consumption taxes our liver.

But high fructose corn syrup is not only a harmful form of fructose; it often contains mercury, it's made from corn syrup that is derived from genetically modified corn, and it adds to the overload of corn already rampant in our diets as corn has shifted from a vegetable into a grain.

High fructose corn syrup is commonly found in bread and bread products, ketchup, tomato and spaghetti sauce, peanut butter, jelly, salad dressing, crackers and cookies and myriad other items including seafood cocktail sauce, barbecue sauce, sweet pickles or relish … just about everything!

When I had dinner with my friend, he wanted to make a special turkey burger recipe for me. Searching for bread without high fructose corn syrup can be quite a challenge in many traditional grocery stores. On a recent trip, I found only one offering out of 28 breads that was made without it. But finding high fructose corn syrup -free bread products such as hamburger buns and hotdog rolls is almost impossible at a traditional grocery store.

It takes a trip to the organic section of my local grocery store (I am fortunate to have access to Hannaford, which has a great selection); Whole Foods or Trader Joe's to find products made without high fructose corn syrup. If your regular grocery store doesn't carry non-high fructose corn syrup options, ask that they do. Or go without the bun.

Most of us consume large amounts of these three unhealthy food additives without knowing it. While we can't control what's in the food we eat in a restaurant or cafeteria, we can control what we cook at home. Once you start reading food labels, you'll be surprised what's actually in the products you're buying. The good news is that there are healthy versions of every product out there that still taste great, if you take the time to look for them.

Enriched Flour is Nutrient Poor: Making Better Bread Choices

5 Food Swaps Part 1

In this chapter, I am going to explore ways you can take an unhealthy food choice and improve it, perhaps even turning it into a healthy choice. We're going to start by looking at bread and learn why enriched flours are nutrient poor and how we can make better bread choices. To understand why most bread today wreaks havoc in our systems, we need to learn more about how wheat is turned into the flour that becomes our bread.

We know that consuming too much white sugar can be hazardous to our health, but many people are unaware that white flour reacts the same way in the body. It doesn't taste sweet, but it does break down into glucose and create the same problems with blood sugar spikes that can lead to metabolic syndrome and Type 2 diabetes. In addition, white flour is devoid of any real nutritional value, so the calories we consume are empty and stored as fat.

A White Bread World

Whole wheat contains many nutrients including vitamins (vitamin E, vitamin B6 and niacin) and minerals (selenium, magnesium and phosphorus), as well as fiber, protein and antioxidants. It's made up of the outside layer called the bran, a middle starch layer and the inside layer called the germ. Most of the nutrients are contained in the bran and the germ. Traditional flour making, however, strips away those two layers leaving just the middle or starch layer. This layer doesn't have any fiber or nutrients to slow its absorption, so it is broken down and absorbed rapidly. (When you eat the whole grain, it is broken down and absorbed slowly and steadily without blood sugar spikes.) The processed version floods the body with too much sugar at once, spiking your blood sugar level and causing the excess sugar to be stored as fat.

Once stripped, the wheat is then often bleached and a few synthetic lab-created vitamins are added to replace what was lost. This process is what enables it to be called “enriched.” But there is nothing rich about this process of taking away a wealth of nutrients and leaving a poor imitation; there are dozens of vitamins and minerals in the original grain and only a few are replaced. Those that are replaced are usually lab-created versions that our bodies cannot absorb as well and they do not have the co-factors found in the original form that would afford full nutritional benefit. In fact, they can even cause some harm to people with sensitivities.

Flour is rich in B vitamins that work together in harmony and balance. The “enrichment” process adds back some synthetic B vitamins that then require the body to rebalance what is already present with what has just been added. The result can be a B-vitamin deficiency. If severe enough, it can manifest as insomnia, heart palpitations, muscle tenderness, fatigue, anxiety, depression or poor memory.

Manufacturers do this because the stripping process leaves flour with a finer texture, increases its shelf life and decreases its attractiveness to bugs. But if a bug won’t eat the flour because there is nothing to sustain its life, why should we consume it?

The original whole grain is also rich in fiber, which helps sweep waste out through the colon; the refined version has no fiber. If you want to try a science experiment, mix about a quarter cup of flour with four tablespoons of water and see what you get: The perfect white glue paste. Now consider what happens as that travels through your colon. That waste is hard to remove, especially if, like the typical fiber-deficient American, you do not have a bowel movement after every meal. Much of that waste will remain in the body creating the perfect environment for parasites to thrive on as well as adding some extra pounds.

But many people love bread, so how can we still enjoy it while minimizing the damage to our health?

Finding a Less-Harmful Bread

The first step is to get rid of the dangerous additives like partially hydrogenated

oil and high fructose corn syrup. If you can only do one thing, read the labels and find a bread that does not contain those additives. In a typical grocery store, that may not be an easy task! You may need to ask your market to carry breads without these additives.

The second step is to reduce or eliminate white flour breads. (Ideally this can be done in conjunction with step one, but I separated it for those who may feel overwhelmed and want to move slowly toward these changes over time.) If you can't eliminate it completely, try to cut down to two to three white bread portions a week. When you do eat it, always eat it as part of a balanced meal with proteins and healthy fats.

Read the labels of the products you buy and put back anything that says enriched flour on it. Look for a true whole grain product. Be aware that most whole wheat breads are nothing more than enriched white flour with caramel added and are often no better for you than white bread. You want whole grain, (100% whole wheat is fine), but read the ingredient label not the marketing slogans and look for 100% whole grains. Multi-grain combination breads are also good. Keep in mind that true whole grains will lose their nutritional value within days of grinding, so they need to be consumed quickly or frozen.

Making those changes will take your bread from being an unhealthy addition to your diet to one that can be a neutral element when consumed in balance. But if you want to take it to the next level, and make your bread something that can actually be a part of a good healthy diet, consider moving toward sprouted grain products.

A Healthy Approach to Bread

All grains, nuts and seeds contain something called phytic acid, which blocks the absorption of minerals. In addition, grains have enzyme inhibitors and compounds that can irritate and inhibit digestion. When grains have been used traditionally, native peoples knew that to avoid these problems, grains needed to be soaked and sprouted. This process not only eliminates the phytic acid concerns, it increases the nutritional value.

The only bread in my house is Ezekiel bread, a dense sprouted grain bread. I

keep it in the freezer and use it for the kids' sandwiches for school. By the time the kids open their lunch bags, it's thawed and ready to eat. If they want it now, we toast it. It has a chewier texture and richer flavor that can take some getting used to if you have lived on white bread, but once you get used to it, you'll find white bread uninteresting and bland. You can get Ezekiel bread (and English muffins) in the freezer section of the organic aisle at most grocery stores; I get mine at Hannaford. It's also available at Whole Foods and Trader Joe's.

Some other healthy options include Alvarado Street Bakery and Shiloh Farms Bakery, which you can find online. And if you need to be gluten free or want to reduce gluten, Cybro's makes gluten-free sprouted-grain breads and you can find them online, too. If you look around, you'll find many options in your local organic markets and you'll likely find local organic bread makers nearby as well.

If you are a baker, you can look for whole grain and sprouted grain flours or try brown rice flour. I do not have any white flour in my house: If I bake, I typically use brown rice flour, which doesn't spike blood sugar levels like white flour. I find it easily in the organic section of any large supermarket.

You may be ready to make a big change and jump to sprouted grain products immediately and if so, that's great. But if traditional bread is a passion, you don't need to give it up completely. Keep your favorite staple, try to cut back on the frequency, eat it in balance with fiber, protein and healthy fats, but add some healthier options in as well. Experiment with different types of breads, and slowly try to move toward healthier choices. You may just find that as you experience the richer flavors of whole and sprouted grains, your taste for the white flour products will dissipate over time.

Craving Carbs? Pick Pasta

5 Food Swaps Part 2

In the previous chapter, I began a series on how to make healthier food choices. I discussed how refined flour is stripped of its nutrients and then “enriched” with lab-created versions of the nutrients. I also shared how flour can spike blood sugar levels and suggested some healthier bread choices. In this chapter, I’m going to look at traditional starch options like pasta, rice and potatoes to see why pasta comes out as the best choice.

I want to talk briefly about why the Glycemic Index is a helpful guide (but not an absolute rule) and look at how it applies to bread to provide context when we look at how pasta, potatoes and rice measure up.

As I discussed in the bread section, certain foods spike blood sugar levels. The Glycemic Index is the scientific system that measures and monitors those increases across all carbohydrates. The lower the number, generally speaking, the better because that means the food will be digested more slowly, will result in less insulin spiking and will provide more protection from diabetes, high blood pressure, high triglycerides, heart disease and obesity.

In addition to helping you to avoid certain health conditions, lower Glycemic Index (GI) foods also aid in weight control. A study of overweight teenagers eating a low GI breakfast showed that they ate 45% fewer calories throughout the day than when they began their day with a high GI breakfast. Foods that stimulate insulin have been shown to increase calorie consumption at the next meal and research shows that if calorie intake is equal, eating lower GI food will result in weight loss.

Problems with the Glycemic Index

But there are a number of problems with relying completely on the index as a

food guide. First, GI food measurements are imprecise. Generally speaking, the test is done several times and the results are an average of those outcomes.

For example, a baked russet potato has been shown to have a GI value as low as 56 and as high as 111. As a result, it is listed in the high 70s on most indexes. The GI index for fruit increases as it ripens and changes depending on the food processing method and time. Grinding or cooking will increase the GI as will cooking for longer periods of time.

The GI of any one food is also altered significantly based on what it is combined with. I recommend eating healthy fat, protein and fiber with every meal because it reduces insulin spiking and decreases the likelihood that higher sugar foods will be stored as fat. But how much you eat matters too: Some foods have a high GI but you likely wouldn't eat a lot of them, so their overall "load" is lower, while others may be lower, but you are more likely to consume a good portion. And lastly, individual responses to carbohydrate digestion vary, as do insulin responses, and those responses have been shown to vary based on the time of day the food is consumed.

As a result, the Glycemic Index can be a helpful tool but should not be relied upon in absolute. It is helpful for making relative comparisons and tradeoffs. Something that falls in the 80s is a less healthy food choice than something that lands in the 40s. Generally speaking, it's a good idea to minimize consumption of foods with scores over 55 on the GI. But some of those foods have great nutritional benefits, so that doesn't mean you should never eat them. Instead, consume them in moderate portions, on occasion, combined with fiber, healthy fats and protein. It's easy to see why a processed bakery product might need to be eliminated, but a potato or watermelon can be eaten in moderation.

Now let's talk about how the Glycemic Index applies to pasta and rice compared to bread.

Bread, Potatoes, Rice and Pasta

In addition to being nutrient devoid, traditional white bread and most whole wheat bread (made from enriched white flour) is high on the Glycemic Index. Typical white or wheat bread and bagels fall in the 70s, while pita bread lands in the high

50s. I love a good French bread as much as the next person, but baguettes fall in the mid-90s!

As you go toward more whole grain products, the Glycemic Index declines, with multigrain bread in the high 40s and sprouted grain breads in the low to mid-40s. Whole grain, multi-grain and sprouted grains are lower GI choices that also offer more nutrient value. (Ezekiel bread, for example, is a complete protein source offering all nine essential amino acids and 18 amino acids in total, all from plants; it's more than just bread.)

It seems logical that pastas would go much the same way as breads, with traditional white and wheat pastas being significantly higher glycemically than whole grain and sprouted grain versions. But that is not the case.

Earlier I said that white bread and baked potatoes have GI scores in the 70s, but there are some better potatoes choices: Boiled, new or sweet potatoes are all in the mid-50s. In addition, brown rice comes in at 55 on the GI, while white rice shows up between 56-64. (Note: Though the Glycemic Index between brown and white rice may seem close, brown rice has much greater nutrient density and is a better food choice.)

Even though some potatoes and brown rice have levels in the mid-50s on the GI, which makes them viable options on occasion, pastas have an even lower GI. During processing, ungelatinized starch granules get trapped in the sponge-like gluten (protein) network inside the pasta dough. This does not occur in the processing of bread or rice and as a result, pastas tend to have a lower Glycemic Index overall.

Traditional spaghetti comes in at 41 on the GI scale, with its whole-wheat version at 37, making these clear winners, with a few caveats.

An Exception: Brown Rice Pasta

There is one surprising exception: brown rice pasta. Brown rice pasta comes in at a whopping 92 on the Glycemic Index: A surprise to me since brown rice itself is not high on the GI and whole grain brown rice is a nutrient-rich food. I'm still researching what it is about the transformation from rice to pasta that makes

brown rice so high on GI scale. But until I learn more, avoid brown rice pasta and stick to traditional pastas.

I do continue to recommend whole grain brown rice as a healthy, nutrient-laden option on occasion; it's got a host of health benefits and comes in at 55 on the GI scale. (Asian noodles also have a relatively low Glycemic Index, so I recommend experimenting with udon, rice vermicelli or hokkein for variety.)

As always, try to limit serving size and frequency; we Americans tend to eat enormous plates full of pasta whereas Europeans eat much smaller portions. And always cook your pasta al dente: The longer you cook it, the higher the Glycemic Index, as the gelatinous protein network breaks down. (One GI table showed that spaghetti boiled for 10-15 minutes came in at 44, but when boiled for only five minutes, it dropped down to 38. Regardless of the exact cooking time, which will vary by product, be sure not to overcook. Try for that al dente firmness that leaves more of the protein intact.)

When you do eat pasta, combine it with healthy fats, proteins and carbohydrates to create a balanced meal; here's where fresh homemade vegetable sauces made with healthy fats can take your meal to a whole new health level. And here's a tip if you are concerned about blood sugar: Add some acid like vinegar or lemon to help lower the GI of the meal.

While you do get some additional nutrient value from a whole grain, multi-grain or sprouted grain pasta, the glycemic difference of whole wheat is not significant versus traditional pastas. Some of the newer whole grain and sprouted grain versions have not even been tested yet and while their scores may be lower, the baseline for traditional pasta is pretty good to begin with.

While I encourage you to experiment and try some of these nutrient-rich grain products -- variety in food choices is always a good thing -- if the taste does not appeal to you, it's OK to indulge in some traditional pasta on occasion. Mangia!

How to Make Healthier Fish Choices

Food Swaps Part 3

In the next chapter in the food swap series, I'm going to look at making healthier fish choices. Fish is a nutrient-rich food proven to improve heart health and prized as a primary nutrient source in many cultures. Fish provides protein without the saturated fat and is a good source of omega 3 fatty acids. Fish has become increasingly popular since word got out about the benefits of eating it at least two times a week.

While fish has many health benefits, some studies have questioned the healthiness of farm-raised fish, especially salmon. There's also concern about dolphins and fish that are killed in the tuna fishing process; their bodies are thrown back into the sea as waste. The popularity of fish has raised concerns about over-fishing and the sustainability of commercial fishing long-term. The quality of fish has diminished, especially those caught closer to shore and those found in lakes and streams, where contaminants foul our water supply.

Choosing the best fish is not just about what kind of health benefits the species has; the way it was raised or caught is also important to the nutritional profile. And if you are concerned about the environment and sustainability, the destruction left in the wake of the fishing boats matters, too. Species, season, diet, life stage, age and location all affect the contaminant level and nutritional profile of fish. There is no standardization for effective comparisons, and very little regulation, measurement or labeling to inform consumers.

Though more Americans are beginning to learn about factory farming concerns with livestock thanks to authors like Michael Pollan and movies like *Food, Inc.*, many of us still know little about the factory farm process for fish. So let's start by

looking at salmon farming and why it raises so many concerns.

Salmon Farming: It's No Swim Upstream

When we think of salmon, we usually see the image of a salmon swimming upstream to spawn, fighting against all odds to lay eggs before it dies. But instead of jumping upstream or powering through the ocean waters, farm salmon circle lazily in small pens that have been likened to floating pig farms. Waste and excess feed cover the sea floor beneath the farms, creating bacteria that consume oxygen that is required to sustain life for creatures that dwell on the ocean floor. Copper sulfate is used on the nets to prevent algae build up but leaves toxic sediment on the sea floor. Fish can also escape through the nets, creating environmental concerns; scientists estimate more than a million farmed Atlantic salmon have escaped into the Pacific and it is unclear what effect this will have on the Pacific salmon population over time.

As with land-based livestock, farm-raised salmon are vaccinated against diseases that spread easily in the close quarters of the pens. They are fed more antibiotics by body weight than any other livestock to prevent infection (creating strains of disease-resistant bacteria in both farmed and wild fish). And they are doused in pesticides to get rid of sea lice.

Sea lice exist in the wild as well, but are rampant in the close quarters of a fish farm. Scientists are concerned that wild species that swim by farms will be exposed to sea lice, which can damage or kill the vulnerable young salmon. Net hauls have dropped significantly and fisherman who once supported the farms as a means of ensuring ocean salmon sustainability are becoming concerned.

Farmers say it's unlikely that they are responsible for a decline in wild salmon because the pesticide emamectin benzoate is only added to feed when sea lice are present. In Canada, the rules state that farmers must stop use of the pesticide 25 days before harvest to keep the fish safe to eat. But it's unclear how much exposure is really OK and how much remains in the fatty tissue after dosage has stopped.

Farm salmon are fed smaller chopped up fish and pellets of feed laden with pesticides, raising concerns about sustainability for those fish. It takes an

average of 2.4 pounds of wild fish to sustain a one-pound farm raised salmon and scientists are concerned that the farming practice is only making sustainability of ocean fishing worse.

To make salmon skins pink, since they don't eat the typical salmon diet of pink krill, thus absorbing cartenoid, or use their muscles as much as typical salmon would, farm salmon are fed synthetic pigments including canthaxanthin to turn their otherwise dull gray flesh a vivid pink. In Canada, the flesh color options, manufactured by pharmaceutical company Hoffman-LaRoche, are delivered to the farmers so they can pick the exact shade of pink they like.

Canthaxanthin, when taken in a sunless tanning pill, was linked to retinal damage in Europe. It's banned in England, and the European commission has issued a warning about it, urging the industry to find an alternative. But it remains legal elsewhere, and in the U.S., scientists aren't focused on it as they put most of their attention into what they deem to be a bigger problem: PCBs and toxic dioxins in the fish.

PCBs, Importation and Mercury

PCBs, or polychlorinated biphenyls, are highly toxic compounds that were banned in the 1970s. They pose serious health risks to children, especially babies and fetuses, who can experience developmental and neurological problems from repeated or prolonged exposure to even small amounts of PCBs. They affect adults as well, especially those with impaired immune systems or insufficient healthy gut flora.

Even though they were banned decades ago, these industrial compounds are very slow to break down and remain present in our environment, especially in sediment at the bottom of streams, lakes, rivers and coastal areas. They can be absorbed by fish and remain in their fatty tissues, building up in humans if contaminated fish is consumed frequently.

While these contaminants are a concern among wild fish, especially any lake or stream fish or those caught close to shore, two major studies have shown that farmed salmon accumulate more of these substances, which are known carcinogens, than wild salmon. The feed appears to be the concern, as it

includes higher amounts of ground up sardines, anchovies and other small fish than a wild salmon would consume.

Manmade contaminants make their way into the ocean and are absorbed by fish. Then those fish are consumed in large amounts by the farm salmon, and the contaminants accumulate in the fatty tissue. It is estimated that farm-raised salmon have seven times as many PCBs in their systems as wild salmon. Farm raised salmon have a higher fat content than wild because they don't move around much as their active wild counterparts, so they have more fatty tissue to absorb contaminants. Unfortunately, the higher fat content is not healthy omega 3 fatty acids; it's less healthy, pro-inflammatory omega 6 fat.

It's estimated that 68% of fish consumed in America is imported from another country, where it is often farmed and not always labeled. While the U.S. has no standards for organic seafood, (though Whole Foods says it has instituted its own farm fish standards to ensure healthy safe fish options), the European Union has had them for years. So organic European fish can be a safe choice. But many fish brought in from other countries contains additional chemicals and additives that we would likely not approve of.

The FDA inspects only about 5% of all imported farm fish, so many countries disregard the rules and take a chance, knowing it's unlikely that they will get caught. Recently, the FDA blocked the sale of three kinds of fish from China because they contained "unapproved" drugs. However, it's equally concerning that there are many "approved" drugs that could have been used freely and allowed to become part of our food supply.

Mercury is another concern in both wild and farm-raised fish. While we eat fish for good heart health, mercury can actually increase the risk of heart attacks. Recent studies have shown that like PCBs and toxins such as bisphenol-A (BPA), a known endocrine disruptor that comes from plastic pollution in our waters, mercury levels are higher in farm-raised fish than in the wild.

Mercury from industrial pollution enters the water and is converted to methylmercury, a toxin that is consumed by smaller fish. Again, the larger fish consume the smaller fish and take in that toxin. This occurs in the wild as well,

however, as we have just seen, the practice of grinding up large amounts of small fish to feed the farm-raised salmon means they eat much more of the small fish than they would in the wild, increasing their ingestion of toxins.

Clearly there are some issues with fish farming. But to be fair, there are issues with wild fishing as well. The same contaminants are present in lakes, streams and rivers, making many fish from those sources no longer safe to eat. Several states have issued advisories on their lake fish. Fish caught close to the coast face the same concerns. While deep-water fish are the least affected by these issues, these fish are often caught through practices like trolling with large nets that result in the accidental death of other species.

So what can we do? Here are some tips for healthier fish consumption.

Making Healthier Fish Choices

Use safe cooking methods to minimize the consumption of skin and fat, where PCBs accumulate. Trim the fish and remove skin and the fat along the backsides and belly and remove the internal organs, lobster tomalley and mustard of crabs, before you cook them. Try grilling and broiling fish, letting the fat drip away while it's cooking and minimize use of fish drippings. Avoid frying fish as that seals in the contaminants. And if you are smoking fish, fillet and remove the skin prior to the smoking process.

If you, or your children, love tuna fish, minimize the exposure to mercury by choosing light tuna, not albacore, and eat it less often. Because their brains and nervous systems are still developing, children are particularly susceptible to mercury contamination. According to the Environmental Defense Fund, chunk/solid white is a larger tuna that accumulates more mercury, while skipjack, which is in most canned light/chunk light tuna, has about one-third the mercury level as albacore.

But it's still important to read the label, as some canned light tuna contains yellowfin tuna, which is similar to albacore in mercury levels. Sometimes labeled (but not always) gourmet or "tonno" these should be eaten only in limited amounts by both children and adults. Small kids should limit tuna to a couple meals a month, while older kids can usually have it safely once a week. (If you

have a compromised immune system or are pregnant, you may want to avoid tuna completely.)

Generally speaking, deep-water, cold-water fish are the least contaminated. If you are buying salmon, always look for Alaska wild sockeye or red salmon. But decide what matters to you: omega 3 consumption, avoiding PCBs and mercury or sustainable fishing and make choices based on your priorities. Ask questions about fish sources and vote with your wallet. Support the call for improved farm-fishing standards and practices. And most importantly, don't be a creature of habit when it comes to fish consumption: Choose a variety of fish for your diet to spread the toxin exposure risk. Fish are a wonderful source of healthy fats and protein and eating fish twice a week—despite the toxin exposure risk—for most people is still a good long-term health choice.

Clearing up the Muddy Waters

While choosing the right fish can be confusing, at least one organization has attempted to simplify the process. The Monterrey Bay Aquarium has put together a guide that evaluates fish based on three major criteria: omega 3 levels, the presence of mercury and other toxins and the sustainability or ocean-friendly status of their harvest/capture. It also factors in whether fish are over-fished and caught faster than they can reproduce.

The aquarium worked with the Harvard School of Public Health and the Environmental Defense Fund to create a list of fish that are Eco-best choices, Eco-good choices and Eco-avoids. They also created a super green list of wild and farmed fish that are good for people and the oceans. The aquarium has created a series of pocket guides by region that you can print and carry with you when you go shopping.

The list changes monthly based on new information. The current best of the best list for May 2010 includes: Albacore Tuna (troll or pole caught from the U.S. or British Columbia), Freshwater Coho Salmon (farmed in tanks from the U.S.), mussels (farmed), oysters (farmed), Pacific sardines (wild caught), rainbow trout (farmed) and salmon (wild caught from Alaska).

No system is perfect, and the aquarium's top choice of tuna that is troll or pole

caught may be a good example, since finding that option in a typical store will be quite challenging, if not impossible. In addition, while they recommend albacore tuna, the Environmental Defense Fund recommends you avoid it for tuna fish sandwiches. Despite not being perfect, the list is an attempt to help you make good choices for your body and our planet. Combined with your own common sense and priorities, you will discover the best fish choices for you and your family.

Not Your Parents' Milk

Food Swaps Part 4

In this chapter, I'm going to look at how we can make healthier dairy choices. Humans are the only species that consume milk past infancy. And we don't just consume it: We inhale it! We drink milk and we eat butter, cream, cheese and ice cream more now than ever before. In 2001, Americans consumed 30 pounds of cheese per person. That is eight times more than we consumed in 1909 and more than double consumption in 1975!

While much of the cheese eaten in the early 1900s was made locally on a farm, today we are eating processed shredded cheeses out of plastic bags and we're eating on the run: About 55% to 65% of the cheese we eat comes from commercially manufactured and prepared foods like packaged snack foods and fast food sandwiches.

Being Dutch, I consider cheese to be one of my four primary foods; I don't think I could live without it. And because of my background and my blood type, I can handle dairy products without any digestive concerns. But over the past few years, I have reduced my dairy intake significantly and made several changes to the dairy products I do consume. Most of us are simply consuming too much dairy; making some changes can go a long way toward improving our health.

Not Your Parents' Milk

Whenever I talk about reducing dairy consumption, I always run into someone who grew up on a farm who argues that their parents lived long healthy lives drinking milk every day. And I don't doubt that, because when I ask about it further, they always say their diet included one glass of milk with a meal and some butter and cheese, all made locally on their farm—which means they

consumed raw, unpasteurized milk and milk products made freshly and untreated. In fact in 1909, 56% of all milk consumed was ingested on the farm where it was produced. By 2001, that number had dropped to 0.3%.

While pasteurization is hailed as a great invention because it kills bacteria and prevents milk from souring, the heat process also kills off many beneficial nutrients. Named after Louis Pasteur, pasteurization was developed as a means of preserving beer and wine. Pasteur never applied it to milk; that came later, in the late 1800s, when dirty urban dairies were trying to find a way to produce cleaner milk. They discovered that pasteurization allowed them to still use the dirty milk, which was easier and cheaper than finding ways to make the milk cleaner.

The idea quickly spread as profits grew. In order to market the new form of milk, producers had to convince consumers that unpasteurized milk was harmful. A smear campaign to link raw milk to diseases was undertaken and today, most people believe that raw milk is dangerous to consume. But the truth is that pasteurized milk poses far more health risks than raw milk.

Raw milk contains healthy bacteria that actually inhibit the growth of harmful organisms; once removed, the pasteurized milk is actually more prone to contamination. In addition, the pasteurization process destroys many vital nutrients in the milk. Studies show up to a 66% loss of vitamins A, E and D and a 50% loss of vitamin C. Vitamins B6 and B12 are totally destroyed by the pasteurization process, as are many beneficial hormones, antibodies and enzymes. One enzyme destroyed in the process is lipase, which impairs fat metabolism and the ability to absorb fat-soluble vitamins such as A and D.

Pasteurization also makes calcium and other minerals less available. One way they test to see if the milk is appropriately pasteurized is to look for the destruction of phosphatase. If it's absent, the milk is considered fully pasteurized. But phosphatase is essential for the absorption of calcium. So pasteurization makes calcium insoluble. It also destroys iodine, the lack of which can cause constipation.

Pasteurization also turns the sugar of milk, lactose, into beta-lactose, which is

more rapidly absorbed in the system and has been shown to make children hungrier sooner. But the dairy industry has formed a strong lobby to prevent the distribution and sale of raw milk in order to protect their profits. They'd rather have you believe it is harmful because if you found out the truth, you probably wouldn't want to drink pasteurized milk.

Hormones, Pesticides and Antibiotics

In addition to not being pasteurized, raw milk is produced on farms that also avoid some of the real dangers of milk and milk products today: hormones, pesticides and antibiotics.

In the chapter on healthier meat choices that follows, I discuss how hormones are used to help the animals to grow bigger. In addition to that injection process, some farms use an additional hormone called rBGH, which is a synthetic growth hormone. Back in the 1930s, a typical cow produced 12 pounds (or about a gallon and a half) of milk a day. By 1988, the average was 39 pounds a day. This was done primarily through selective breeding and using rBGH. Today a cow can now generate 50 pounds of milk a day.

Cows injected with rBGH are 79% more likely to contract mastitis (an infection of the udder). Those cows also suffer from reproductive difficulties, digestive problems, an increased need for antibiotics and other abnormalities. Consumer's Union reports that milk from rBGH treated cows is more likely to be of lower quality and contain more pus and bacteria than milk from untreated cows.

But even if you find milk from farms that don't use rBGH, other harmful hormones present in the cow remain. In addition to the ear pellet they receive as a calf containing synthetic hormones to help them grow, cows' milk contains high amounts of estrogen because 75% to 90% of milk comes from pregnant cows. Milk from a late-stage pregnant cow can have up to 33 times as much estrone sulfate (a form of estrogen) and 10 times more progesterone. Much research ties excess estrogen to reproductive cancers such as prostate, testes, ovarian and breast cancer. Male breast enlargement has also been tied to high dairy and hormone-laden meat consumption.

Test analysis has revealed traces of 80 different types of antibiotics in milk.

Animal products like milk can also contain up to 14 times more pesticides than plants If you worry about pesticides in produce, you should be even more concerned about pesticides in meat and milk.

Anyone who has been pregnant, or been around a pregnant woman, understands the effect high hormone levels can have on the body. They have likely also seen that what the mother eats is transferred to the child through the milk and has an immediate and noticeable effect on the child if there is an allergy or sensitivity issue. Consuming the milk of a perennially pregnant cow makes consuming estrogen unavoidable. As one physician/scientist from the Harvard School of Pubic Health put it, “The milk we drink today is quite unlike the milk our ancestors were drinking without apparent harm.”

A new process has been developed called ultra-pasteurization, which involves longer treatment times at higher temperatures, resulting in milk that is totally sterile. It’s not being advertised, but you can look for the word in small print on almost every national brand and even some organic brands (Horizon, the largest organic producer, now ultra-pasteurizes.)

Given all the challenges with modern milk production, it’s no surprise that many Americans are allergic or sensitive to it and that it can cause headaches, sinus and chest congestion, stomach pain, cramping, diarrhea, gas and sore, scratchy throats. Milk has also been linked to asthma, atherosclerosis, upper respiratory and ear infections, obesity and cancer. (Many doctors now think children with recurring ear infections may have dairy sensitivities.)

Many people have difficulties digesting milk even if they are not lactose intolerant. According to Dr. Walter Willett of Harvard University, “The majority of humans naturally stop producing significant amounts of lactase -- the enzyme needed to properly metabolize lactose, the sugar in milk -- sometime between the ages of two and five. In fact, for most mammals, the normal condition is to stop producing the enzymes needed to properly digest and metabolize milk after they have been weaned. Our bodies just weren’t made to digest milk on a regular basis. Instead, most scientists agree that it’s better for us to get calcium, potassium, protein, and fats from other food sources, like whole plant foods -- vegetables, fruits, beans, whole grains, nuts, seeds, and seaweed.”

The Many Varieties of Milk

For my family and myself, traditional milk, even organic, is simply not a good health choice. Raw milk not only avoids the hormone, antibiotic and pesticide challenges of modern milk production, it also offers the nutrients and enzymes that the pasteurization process destroys. Raw milk is a complete source of protein full of beneficial bacteria and vitamins, minerals and enzymes. If you are going to consume cow's milk, I suggest you do so sparingly and that you explore raw milk options.

In some states, you can buy raw milk in stores such as Whole Foods. In most states, however, you'll have to buy directly from the farm. And that may not be a viable option for some. When I moved from Maine to Massachusetts, I lost my easy access to raw milk. So I had to look for other options and another option to consider is goat's milk. Much of the world consumes goat not cow's milk, because it's more widely available and also because most people can digest goat's milk readily, even if they cannot tolerate cow's milk.

Goat's milk is a great source of calcium and protein, phosphorus, riboflavin (vitamin B2), potassium and the amino acid tryptophan. It's also been shown to enhance the metabolism of copper and iron. For those with milk allergy symptoms such as asthma, eczema, ear infections and rheumatoid arthritis, switching to goat milk may help alleviate symptoms.

The major problem with goat milk is the expense. For many people who consume moderate or large amounts of milk, it will not be financially viable. I personally consume very little milk. I put a small amount in my chai tea in the morning and I use a little when I make a risotto or a sauce that I want to have some depth or richness. I find that a small amount of goat's milk does the trick and makes for a delicious and rich sauce. Because I use so little and a half gallon can last me more than two weeks, (and yes, it lasts that long without spoiling), I justify the expense. (I definitely noticed a reduction in bloating after switching from cow's to goat's milk.)

For those who can't access or afford raw milk or goat milk, or who want a non-animal option, I recommend rice or almond milk. Almond milk can be made

inexpensively at home so it's a great option if you want a fresh milk alternative that doesn't cost a lot.

I do not recommend soy milk, though it does contain some nutrients and protein, because it contains a natural chemical that mimics estrogen. These "fake" estrogens take up the hormone receptor sites intended for real estrogen, which leaves the excess estrogen unable to connect to a receptor site and left to wander around the body.

Studies show excess estrogen can alter sexual development and can lead to reproductive concerns and cancers. Early puberty and male breast development are common side effects of excess estrogen. One study showed that two glasses of soy milk a day contained enough pseudo-estrogen to alter the timing of a woman's reproductive cycle. As a result, I suggest everyone avoid soymilk.

Choose Better Cheese

While I have focused predominantly on milk since it is the source for all dairy, cheese is a far bigger component of most people's diets than milk. In general, we eat way too much cheese and cutting back on processed foods with cheese or hidden cheese in fast foods is a great step toward better health. When you do choose cheese, the same principles that we discussed above apply: Look for raw milk cheese (most markets carry some, especially raw milk bleu cheeses and they are delicious) and goat's milk cheese, which are also prevalent and tasty. Experiment with these kinds of cheese and if you are a cheese lover like me, you'll find some delicious new options in raw milk and goat's milk cheeses.

Occasionally, I do eat traditional cheese, but I buy it from Europe because the European Union has banned all hormones. When you buy a cheese from the mountainous Alps region of France or Switzerland, you are typically getting cheese made the traditional old-fashioned way from cows or goats who have roamed free in the sunshine, eating grass and living without pesticides, chemicals or drugs.

How Much is Too Much?

So now that we have looked at milk and cheese options, how much, if any, dairy

should you consume? Less is definitely more when it comes to dairy: For me, a little bit of raw milk or goat cheese makes my day and I try to eliminate eating cheese that is an afterthought rather than a primary focus in my meal. I believe in bioindividuality, which means I think that every body is different and your tolerance will depend on your own lifestyle factors and diet, as well as that of your ancestors. Some people can handle dairy without incident while others should cut it out completely. This may be due in part to the enzymes present in our blood.

Dr. Peter D'Adamo argues in his blood type diet book, *Eat Right for Your Type* that blood type Bs (as I am) can handle dairy. Because ABs have some B in them, they can handle a little dairy as well. But type A should significantly reduce if not eliminate dairy and blood type O should completely avoid all dairy. This may or may not ring true for you, but if you are at all curious, I suggest eliminating dairy completely for two weeks, especially if you have any symptoms like headaches, IBS, sinuses, asthma or bloating/gas, and see how you feel during that time. (That includes all milk, cheese, yogurt, butter and ice cream.) Then reintroduce it slowly and see how you feel as you begin to eat it again: you'll know right away if you can handle dairy and what types affect you more than others.

When Eating Meat, Hold the Chemicals

Food Swaps Part 5

I'm going to end the food swap series by looking at making better meat choices. Unless you're a vegetarian whose health is thriving, you most likely need to pay more attention to your animal protein selections. While it is possible to get everything you need to be healthy purely from plants, it's difficult to do so.

Almost every civilization has included some animal protein in its diet, even if it was only insects and bugs. While most of us do need to consume some animal protein to maintain optimal health, it's likely that you are eating too much meat in general as well as too much unhealthy meat.

If you haven't read the books *The Omnivore's Dilemma* by Michael Pollan and *Eating Animals* by Jonathan Safran Foer, or seen the movie *Food, Inc.*, I strongly encourage you to check them out. I could easily write a chapter on factory farming and the challenges it poses to our food supply. But I'll save most of that for another day. However, I do want to tell you a little bit about hormones, pesticides and antibiotics in meat and why eating them can be bad for your health.

Hold the Hormones

For decades, the meat and dairy industries have been using hormones to help young livestock gain weight faster. More weight means more meat means more profit. A pellet is typically implanted in the animal's ear that releases hormones, commonly synthetic estrogens and testosterone, throughout its life.

The hormones remain in the animal's fatty tissue and are present in the meat we eat, albeit in smaller doses than the human body typically produces. But even small amounts of hormones have been shown to have big effects on some body processes. It's long been known that excess exposure to estrogen increases

breast cancer risk and now we know it increases prostate cancer risk too. Hormone-treated meat has been suspected of contributing to early puberty and male breast development.

The European Union has banned all hormones in meat. But there aren't any studies underway in the U.S. to evaluate hormone safety in meat and milk, so this practice will likely continue. Perhaps if we were not so heavily exposed to estrogenic compounds in our daily environment, this might not be so problematic. But estrogenic compounds are hard to avoid and eating hormone-laden meat just adds to the burden on your body.

Rising Antibiotic Resistance

We know the benefits of taking antibiotics when we have a bacterial illness, but most livestock in the U.S. are fed antibiotics even when they aren't sick! Antibiotics are primarily used to make animals gain weight. But now researchers are becoming concerned with this practice, as they fear it is giving rise to antibiotic-resistant bacteria, which could pose a serious health risk.

In fact, a number of studies have shown growing resistance to antibiotics, including one in the New England Journal of Medicine that revealed that 84% of the salmonella bacteria found in supermarket ground beef was resistant to some antibiotics. Another study showed that pork that came from animals that had been fed the antibiotic ciprofloxacin led to people catching resistant strains of salmonella. The FDA estimates that 11,000 people caught intestinal illnesses in 1999 from eating antibiotic-resistant bacteria in chicken.

Pesticides: Not Just a Concern with Produce

We hear a lot about pesticides with respect to produce, and they are a concern. But pesticides in our meat supply may pose an even greater danger. You can ingest far more pesticides on a meat-heavy diet than you would from consuming fruits and vegetables. Today's livestock are not fed a traditional diet, but rather a feed that is loaded with pesticides. (The feed also often contains meat from diseased animals that die before slaughter.)

Pesticides accumulate in the flesh of animals and have been shown to cause

cancer, nerve damage, birth defects, and to inhibit the proper absorption of food nutrients. According to the Environmental Protection Agency, 90% of fungicides, 60% of herbicides and 30% of insecticides are known carcinogens.

The EPA does set limits on how much pesticide can be used (according to what they deem as safe) and how much is allowed to remain on food. However, the only way to know for sure is to have the food tested, which does not occur today. So it's really a guess as to how much is left behind and whether that amount of pesticides is "safe" or not. The EPA also states that in certain cases, such as economic loss to farmers, unauthorized pesticides (those known to be unsafe) are knowingly allowed to be used.

Making Better Meat Choices

Thankfully, in most supermarkets today you can find meat labeled as hormone free, antibiotic free and pesticide free, and that's what I buy. (This does not alleviate all the problems associated with today's farming practices, but it's a step in the right direction.)

Because the food supply of the livestock is a big part of the problem, whenever possible, I look for grass-fed meat or chicken raised on something other than vegetarian feed. It can be hard to find, and it can be expensive, but I think it's worth it. My kids also think it tastes much better; they can tell the difference!

Many people eat too much meat in one meal, so cutting back on portion size is another way to make eating meat more economical and healthy. Meat portions should never be larger than the palm of your hand. (Yes, that does mean those with bigger hands get a slight advantage!) But no one has a hand large enough to accommodate a 16 oz. porterhouse steak: a little meat protein goes a long way.

Another good food swap is to substitute bison for beef. Bison are fed grass instead of grain and are typically not given hormones, antibiotics or pesticides. Bison meat also has very little intramuscular fat, so it is low in fat, saturated fat and cholesterol versus beef, pork or chicken. Venison is also a good choice.

Lastly, a comment on luncheon meats. In addition to the concerns already

mentioned about hormones, pesticides and antibiotics in the meats, most packaged meats (bacon, salami, ham, pepperoni, hot dogs, etc.) contain nitrates as a preservative. Sodium nitrate is converted into nitrosamines, which are chemicals that can cause cancer.

While nitrosamines can cause virtually any kind of cancer, the Journal of the American Medical Association shows that people eating more processed meat were 50% more likely to develop lower colon cancer. Nitrosamines have also been linked to a 68% higher risk of pancreatic cancer, and increasing consumption of processed meats by 30 grams resulted in a 15% to 38% increase in risk for developing stomach cancer.

Consumption of nitrates has been shown to cause an increase in brain tumors in children and to result in DNA mutations. The food industry calls nitrates a color fixer, as they turn meats bright red and can make old, gray, unattractive meat look healthy and delicious.

But the good news is that most major grocery store chains have some nitrate-free meat in their organic sections and you can find them at Trader Joe's and Whole Foods. Again, they can cost a little more, but I'd rather see my meat as it really is and skip the cancer risk, especially for my kids, as their developing bodies can handle fewer toxins.

While these changes won't fix the problems in our food supply, they will help you make healthier meat choices. Becoming an educated consumer and voting with your wallet is a step toward getting better meat options in our stores that are free of hormones, pesticides, antibiotics and nitrates.

Meat, Ammonia, School Lunch, the Government, and You

In the previous chapter on healthier meat swaps, I wrote about some of the problems with the presence of hormones, antibiotics and pesticides in our meat supply today. In this chapter, I'd like to follow up and talk a little more about what is going on in today's food processing world and share with you a shocking practice of treating questionable meat with ammonia to make it marketable.

Then I will follow up with a recent report by the USDA, which acknowledges pesticides, drugs and heavy metals regularly contaminate our meat supply, that they know about it but cannot get various government agencies in alignment in order to take action, and that this meat is knowingly and regularly distributed to big box stores, fast food restaurants and to our school lunch programs where it is fed to our children.

Unlike the other chapters in this book that focus directly on things you can do, yourself, this chapter about understanding more about what is really going on with food today so that you can begin to ask more questions and better understand that the government is not prioritizing your best interests. Hopefully, it inspires you to take action, such as joining Jamie Oliver's Food Revolution for healthier school lunches, to speak out about better food, and to vote with your pocketbook when it comes to healthy food choices.

Ammonia and Meat

To begin, I'd like to tell you a story. It's a story that may shock you if you haven't heard it already. A story rich in drama, intrigue and cover-ups.

One that involves you, if you eat fast food, and one that involves your kids if they eat school lunches. A story that you should care about even if neither of the above is true. A story that may seem to be science fiction, but sadly, is true; it

was reported in the New York Times on December 30, 2009. It is a story that reflects the current state of food in America and its impact on our health.

Once upon a time, there was a beef processing company called Beef Products Inc. who was, as most companies are, looking to make more money. They wanted to try to find a way to take the fatty meat trimmings that could only be sold for pet food or cooking oil and create a product they could use to enter the hamburger business. But because the trimmings were very susceptible to contamination by E. coli and salmonella, they had to find a way to treat the meat scraps so that they would be safe from contamination.

So they developed a process to treat the meat with ammonia. Yes, ammonia, the ingredient used in your household cleaner which has a warning on the label regarding breathing or ingestion and information about poison control.

Now to be clear, untreated meat has a natural ammonia level that rates about 6 on the pH scale, similar to milk or rain water. But this company found that if they treated the beef with an ammonia process that resulted in changing the pH level to about 10, they could kill the E.coli and salmonella. That is an alkalinity that surpasses the range of most foods.

Pink Slime

So they took their study to the U.S.D.A., who was worried about E. coli and salmonella. One former U.S.D.A. microbiologist admitted that he and several scientists were concerned that no independent validation of safety had been provided. Another, Gerald Zirnstein said the processed beef looked like “pink slime” and went on to say “I do not consider the stuff to be ground beef, and I consider allowing it in ground beef to be a form of fraudulent labeling.”

But in the end, the U.S.D.A. not only approved the ammonia processed meat, they were so pleased with the performance of the ammonia process that when they started routine testing of the hamburger meat, they exempted the company, considering their meat safe enough to skip testing.

The Agricultural Marketing Service, the U.S.D.A. division that is responsible for buying food for school lunches, seemed to be a voice of reason. Complaints were made about the smell and a 2002 memo states that they “had to determine if the addition of ammonia to the product is in the best interest of the A.M.S. from a quality standpoint.”

In addition, they stated, “The product should be labeled accordingly.”

A top lawyer and lobbyist for the meat industry argued on the company’s behalf that another company had just received approval to not disclose a chemical used in treating poultry, so therefore this company shouldn’t have to disclose the ammonia. He won.

The Food and Drug Administration approved the ammonia process, considering it safe when used as a processing agent in food.

Making Money from Meat Previously Unfit for Human Consumption

So the company sold its ammonia treated meat to McDonalds and Burger King and all the other fast food chains, as well as to many grocery stores.

In the end, the school lunch officials overcame their objections and decided to use the meat too because it saved 3 cents a pound off the cost of making ground beef. In 2009, the company sold about 5.5 million pounds of the ammonia processed meat to schools alone.

And so the company, which does not disclose its earnings, generated an estimated $440 million dollars a year in additional revenue from the trimmings previously unfit for human consumption.

And we, as consumers, would probably never have known about this at all, had it not been for a problem.

The ammonia process left the meat smelling pungently of ammonia, even as the company produced a taste test saying that some school children preferred the taste of burgers with more of the ammonia processed meat.

In Georgia, officials returned 7000 pounds of the meat to the company after smelling a “very strong odor of ammonia” in the meat being used to make meatloaf for state prisons. (They did not know about the ammonia process, because it was not on the label, so they assumed the meat had been tainted.) They noted in their complaint, according to the New York Times, that the “level of ammonia in the beef was similar to levels found in the contamination incidents involving chicken and milk that had sickened schoolchildren.”

The company told the U.S.D.A. that it was safe and that when it was diluted with other ground beef and mixed together, it would be fine. The U.S.D.A. accepted this conclusion, so the company was off the hook.

But others complained about the smell, too.

Beef Recalls

So the company had to do something and it released new research showing that E. coli and salmonella were undetectable at pH levels of 8.5. That enabled it to reduce the level of ammonia and lessen the smell. So they altered the process to lower the pH level, though they would not reveal to exactly what level. (Samples that the NY Times collected showed a pH as low as 7.75, below their revised test minimum.)

But in doing so, this left the fatty meat scraps more vulnerable to contamination.

And that is where the company surfaced on the public radar.

School lunch program testing revealed E. coli and salmonella dozens of times in this company’s meat. There were two back-to-back incidents in August 2009 that concluded two 27,000 pound batches were contaminated, but thankfully they were caught before the meat was consumed by school children.

That July, salmonella concerns resulted in a temporary ban of this company's meat by school officials in Kansas. It was the third time in three years this company's meat had been banned. But the processing facility remained open and continued to supply other customers (including fast food restaurants and grocery stores) with meat even though they couldn't sell to schools during that time.

When the NY Times broke the story and presented the U.S.D.A. with the information, top officials said that they did not know what their peers in the lunch program had known for years.

The agriculture department responded and revoked this company's freedom from routine testing. It also reversed its policy about pathogens: because this beef was supposedly pathogen free, it was not included in recalls, even when it was found in tainted hamburgers!

Food Safety Disconnect -- What is Wrong?

While in a way I feel we should cheer that there was a response as a result of the NY Times investigation, it's clear that there is a disconnect between the various divisions of government and that the lack of communication and knowledge exchange is hindering public safety.

But more than that, I am concerned that we as a public have become too comfortable with scandal and no longer react.

I am not sure what aspect of this story bothers me most:

- The fact that ammonia is being injected into meat;
- The fact that the process of injecting ammonia into substandard previously inedible meat makes it then acceptable;

- The fact that despite no outside substantiation that this process is safe, it is approved;
- The fact that because it is seemingly safe, it is exempt from any further testing;
- The fact that this meat is being consumed by school children as part of hot lunch programs in order to save pennies;
- The fact that government agencies -- and branches of the same agency -- don't talk to each other; (When that happens in corporations, we consider them dysfunctional and they usually don't stick around long.)
- The fact that the company continued to sell the meat to other customers even after contamination was confirmed by one customer;
- That there is no real recourse to be taken against this company and it continues on as before selling its ammonia-laden meat, although now it is no longer exempt from testing;
- Or that when all of this comes to light, we read it and move on.

Poisoning Children

I have many health conscious friends. When I discussed this with one, he said, "well that is yet another in a long list of reasons why I don't eat fast food." And when I said "Yes, but what about your kids eating lunch in school," he said, "that is yet another reason why I pack their lunches." I too pack my kids lunches for many such reasons. But what about the kids who are eating there because they are on the subsidized lunch programs or because their parents believe the food they are getting is good or better than what they could come up with on their busy schedules?

Does it not upset you to know this is happening?

His response was that it is no surprise to him that this stuff goes on based on what he knows about the government and the operation of its agencies, especially regarding food. That they represent agriculture and food companies, not consumers.

OK, I know that too. But even knowing that, I still feel we can do better. I still feel outraged that we are allowing substandard food products to replace real food in our diets.

Is this what we want to eat? Is this what we think is best to feed growing children?

Are we ok with food decisions that are made to save three cents because we deem that more important than health and wellness?

It strikes me that it is not dissimilar to the situation in the automobile industry in America. I remember being in a meeting twenty years ago in which there was a discussion over whether saving a half a cent on a screw that would last through warranty (hopefully) was worth it over spending an extra half a cent for the more expensive screw that would last 10+ years.

It took awhile, but car manufacturers finally realized that they needed to take a more holistic view: that there were other costs associated with choosing the less expensive screw. Things changed when the decisions were no longer made solely by those focused on short-term immediate costs: when people began to realize there were longer-term costs that had to be factored in as well.

We need to change the system and fix the broken processes. When will we take a more holistic view of our food choices and realize that while budgets are tight, some savings are simply too costly to justify?

So Why Doesn't the Government Intervene?

The rationale for using ammonia was to treat the meat to prevent pathogens such as E coli. In the report that follows, however, the focus is on chemical contaminants like veterinary drugs and antibiotics, heavy metals (such as copper, cadmium and arsenic), dioxins, polybrominated diphenylethers (fire retardants), and pesticides with cancelled registrations that remain in the meat. The problem with these chemical contaminants is that not only are they not destroyed by cooking, as E coli is, but they can actually intensify when cooked and become even more harmful.

The report concludes that the various agencies policing our meat supply are not working together to establish reasonable tolerance levels for these contaminants: they are not only not testing for them, they have not even established the appropriate thresholds for any testing safety levels. It appears to be a take off on the Laurel and Hardy skit of “Who’s on First.”

Let’s look at how it is supposed to work. (Bear with me through all the acronyms and initials.)

The U.S. Department of Agriculture’s (USDA) Food Safety and Inspection Service (FSIS) administers the national residue program. The FDA (Food and Drug Administration) and the EPA (Environmental Protection Agency) each play a key role in the process and in addition, they established a joint Surveillance Advisory Team (SAT) and an Interactive Residue Control Group (IRCG) to help reach their program goals.

Each year, the SAT is supposed to call on the FDA, the EPA and FSIS to determine what residues they will be testing for that year. Despite the fact that they convene and form a joint consensus, each year the FSIS continues to only test for one type of pesticide.

The EPA claims that FSIS refuses its requests for additional pesticide testing. The FSIS, however, counterclaims that the EPA has not set the established tolerances for which it is supposed to test so it cannot test for them. (At the same time, it also states it doesn’t have the resources to do the testing.)

For any testing that does occur, the FDA must approve the proper testing methods. However, the FDA continues to make use of antiquated testing

methods and has continually been unwilling or unable to use newer testing methodologies.

The methods employed by the various agencies are often in conflict with each other, which is why the SAT was created to begin with: to help them coordinate and communicate to make it happen. But year after year, no progress seems to be made. The report concludes there is a problem and that improvements must be made. Not surprisingly, this did not make headlines!

In addition, the report indicates that meat plant violations do not seem to concern the FSIS as they should. In 2008, one plant received over 200 violations, but was still allowed to continue operating after the FSIS declared the violations “not likely to occur,”

One of the concerns highlighted is the practice of cow ‘recycling.’ When a dairy cow gets too old or sick to produce any more milk, they are slaughtered and the ‘spent’ dairy cow meat makes it way into our meat supply. This causes concern because of the hormones, antibiotics, and pesticides present within the meat fat of those cows. A 2008 investigation revealed that 90% of the residue violations occurred in plants that process the spent dairy cows.

The same plants also process what is known as “bob” veal, or male calves born to dairy cows. Dairy cows receive large amounts of antibiotics after they give birth to calves to treat and prevent birth-related infections. Dairy producers must wait a certain amount of time before they can sell the antibiotic laden milk for human consumption. So rather than waste the milk, they feed the antibiotic laden milk to the bob veal calves. The drugs never have a chance to leave their systems, and so they remain in the veal meat that is ultimately purchased by consumers. (And if the dairy cow does not recover after birth, she is slaughtered and her meat enters our food supply as well.)

Another concern highlighted in the report is the fact that livestock are now being fed industrial waste that remains after the process of converting corn into ethanol fuel. The remains are known as ‘distillers’ grains.’ The USDA is aware that they are more likely to contain E coli, but they do not choose to regulate the use of distillers’ grains in cattle feed. The ethanol fermentation process requires a lot of

antibiotics as well, so those residues also remain in distillers' grains. In addition, they are laden with mycotoxins, which are linked to an imbalance in pigs called Mulberry Heart Disease, which can cause sudden death.

In the end, because there are no regulations and testing is not being done, this meat ends up in our food supply and the more tainted it is, or the lower the quality, often, the cheaper it is. That makes it more appealing to fast food restaurants, big chain supermarkets, and of course, our school lunch programs where it is fed to developing children who are even more sensitive to the drugs, chemicals, and antibiotics than adults are.

Another section of the report highlighted how the agencies fail to communicate. In one example, the EPA has recently cancelled use of all pesticides containing lindane and will revoke its current lindane tolerance.

The report states "One FSIS official stated that without a tolerance or a zero tolerance if FSIS finds lindane as a residue, it will have no basis for acting to protect the U.S. food supply from unacceptable levels of this pesticide. Another FSIS official disagreed and noted that in the absence of a tolerance (e.g., for lindane) any residue of a pesticide would be illegal and would adulterate the food – making it unnecessary to create a zero tolerance. Regardless of their position, both officials agreed that the agency needed to clarify its procedures regarding the actions agency personnel are to take concerning the disposition of carcasses that contain a potentially hazardous substance where no official tolerance has been established by the FDA or EPA."

I don't quite understand how canceling use of all pesticides containing lindane can be considered not establishing an official tolerance level, but that's why I don't work for the government!

So what can we do? We continue to hear these stories and maybe we are becoming de-sensitized or we just accept the inability of our government to adequately protect us and our food supply. But there are things we can do.

Support local farmers and CSAs where you can meet and know the producers of the food you are eating and ask them questions about their practices. Educate yourself by reading the reports such as the one below and becoming aware of

the challenges faced by our current food practices. Vote with your pocket book, and speak out to your representatives: let them know you care about our food supply and the health of our children and you want something better.

There's no point reforming our health care system if we are not changing our farming and food policies: let's get to the cause and not the symptom.

Please read the Executive Summary below. And if you are at all concerned about the food served in school lunches, consider joining British Chef and Food Revolutionary Jamie Oliver, as he tries to improve the food in our school lunches. You can become a revolutionary by going to www.jamiesfoodrevolution.com and signing a petition to help change the school food guidelines, or you can join a local Food Revolutionary group. (I moderate the North Shore MA Food Revolutionaries group and you can friend us on Facebook.)

FSIS National Residue Program for Cattle

Executive Summary

One of the public food safety issues facing the United States is the contamination of meat with residual veterinary drugs, pesticides, and heavy metals. "Residue" of this sort finds its way into the food supply when producers bring animals to slaughter plants while they have these residual contaminants in their system. When the animals are slaughtered, traces of the drugs or pesticides contained in these animals' meat is shipped to meat processors and retail supermarkets, and eventually purchased by consumers.

In order to safeguard the Nation's food supply from harmful residue, the U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS) administers the national residue program. FSIS inspectors sample meat processed through slaughter plants for residue testing and compare the results with tolerances established by the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) to prevent adulterated meat from entering into commerce.

The Office of Inspector General (OIG) initiated this audit to evaluate the effectiveness of the national residue program and to assess how well FSIS, FDA, and EPA were coordinating to accomplish the program's objectives.

Based on our review, we found that the national residue program is not accomplishing its mission of monitoring the food supply for harmful residues. Together, FSIS, FDA, and EPA have not established thresholds for many dangerous substances (e.g., copper or dioxin), which has resulted in meat with these substances being distributed in commerce. Additionally, FSIS does not attempt to recall meat, even when its tests have confirmed the excessive presence of veterinary drugs.

To address these serious shortcomings in the national residue program, FSIS, EPA, and FDA need to take steps to improve how they coordinate with one another to accomplish the program's mission. Recognizing that they needed to work together to prevent residue from entering the food supply, the three agencies established the Surveillance Advisory Team (SAT) and the Interagency Residue Control Group (IRCG) as a way of coming together to communicate and coordinate.

We found, however, that there were a wide range of problems with relying on this process: not all agencies were equally committed to the SAT and IRCG; essential participants were not required to attend; and no one agency had authority to ensure that necessary actions were taken to deal with disagreements. Due to problems with how the SAT and IRCG were established and were functioning, we identified four issues relating to coordination between FSIS, EPA, and FDA.

The three agencies involved need to: 1) expand the substances they test for, 2) improve their methodology for sampling hazardous residues, 3) determine more efficient ways of approving newer methods of testing for drug residues, and 4) collaborate to set tolerances for additional residues.

{You can read the full report at http://www.usda.gov/oig/webdocs/24601-08-KC.pdf.}

How to Buy the Right Fruits and Veggies

In New England, May and June are sometimes what we affectionately term mud season: rain … and then more rain. One year, my kids' weekend sports events were rained out every single weekend in May and June except one! But last season, we were blessed with an incredible spring that felt more like summer.

On a beautiful 80-degree day, I took my kids to the beach after school and along the way, we stopped at our favorite farm stand to buy fresh strawberries, cherries and tomatoes. While early in the season, the summer-like weather has brought them to market early, looking juicy and delicious. My kids wanted to devour them the minute we got back in the car but I made them wait until we could wash off the pesticide residues.

In the coming chapters, I want to answer some of the questions people ask me regularly about making healthy fruit and vegetable choices, such as: when is it worth splurging on organic if my budget is tight? Is frozen better than canned? Do I need to wash everything, even if it has a skin? And, how do I decide between local and organic?

I'm going to begin by telling you which fruits and vegetables are the safest, and which are the most pesticide-ridden, so that you can start making better choices immediately.

The Dirty Dozen

Several years ago, Consumer Reports magazine assessed the pesticide residue

levels in fruits and vegetables based on data from the USDA, with foods prepared as they would be in a typical home.

The score was a composite that was based on how many samples contained pesticides, the average amount and the toxicity of the particular pesticides that were found. In this report, a result over 100 indicated cause for concern. Peaches domestically grown in North America came in at 4,848. Winter squash (domestically grown) came in at 1,706. Domestic apples landed at 550. Domestic pears, spinach, grapes, celery, green beans, grapes from Chile and spinach from Mexico all fell in the 250-450 range.

With anything over 100 being cause for concern, this study illustrates why people are so worried about pesticides in our produce supply and why it is worth spending more for organic.

Organic foods will rarely be completely pesticide-free; they still have some trace levels of pesticides due to contaminants that remain in the soil or are airborne. However, studies have shown that people who consume conventional fruits and vegetables have pesticide residues in their urine and those who consume organic fruits and vegetables do not.

In today's economy, money can be tight and we are all looking to stretch wherever we can; but spending a little more to buy organic can be a wise investment in your health. If you cannot afford to buy everything organic, but you still want to make some healthier food choices, here are the 12 fruits and vegetables that are worth splurging for organic. According to the Environmental Working Group, these fruits and vegetables contain between 47-67 pesticides per serving (which cannot be washed away).

In order (from worst to somewhat better, keeping in mind all 12 of these should be avoided to the extent possible if they are not organic), they are:

- Celery
- Peaches
- Strawberries

- Apples
- Domestic blueberries
- Nectarines
- Sweet Bell Peppers
- Spinach, kale and collard greens
- Cherries
- Potatoes
- Imported Grapes
- Lettuce

If your five+ servings a day of fruits and vegetables are coming primarily from these foods, you are taking in high levels of pesticides that are linked to autoimmune disorders, cancer and ADHD. (And I suspect many other conditions that studies have not yet revealed because of lack of funding for such research.)

We can handle a little bit of pesticides from time to time, but if you are eating other foods that contain toxins or consuming a lot of fructose or drinking a lot of alcohol, your liver is already busier than it should be and it isn't fully available to detoxify your chemical load.

If you eat from this group regularly, over time you will add significantly to your toxic load; you need to consider not only the effect of these foods, but also the effect of these foods in conjunction with the other things you are eating and doing (or not doing). Children, pregnant women and those with compromised immune systems need to be especially vigilant. It's estimated you can avoid as much as 80% of your pesticide exposure by choosing organic forms of these fruits and vegetables.

The Clean 15

It may not be that helpful to assess the rest of the fruits and vegetables because your primary focus should be on avoiding non-organic forms of the produce above. But it often surprises people to know some of the cleanest, least pesticide-ridden produce.

In order, from best to not as good, but still pretty clean, they are:

- Onions
- Avocados
- Sweet corn
- Pineapples
- Mango
- Sweet peas
- Asparagus
- Kiwi fruit
- Cabbage
- Eggplant
- Cantaloupe_
- Watermelon
- Grapefruit
- Sweet potatoes
- Sweet onions

While we might like to eat only organic fruits and vegetables because they are

healthier and often they taste better, if you are watching your pennies, there is no reason to splurge on organic forms of these.

It's important to note that pesticide residue levels are measured after produce is washed and peeled. So no matter what you are buying, even the clean 15, you should clean your produce with a good veggie wash. You can find citrus-based veggie washes in your grocery produce aisle: water is not usually enough. I wash everything that comes into my house, even if it says it has already been washed. And peeling soft skinned fruits will help reduce pesticide levels as well.

The fruits and vegetables that do not appear on either list are just that: not the best, but not the worst. You'll want to weigh the conventional versus organic options in light of what else you eat and your financial considerations. If you opt to buy conventional instead of organic, always look to buy produce that is as local as possible. If not at a farmer's market, your local supermarket often has some produce from regional farms and that is always a better choice than food from far away.

Dissecting Food Labels

In addition to the above lists, you also need to be a wise consumer and read produce signs and labels carefully when purchasing fruits and vegetables. Food stores such as Whole Foods and Trader Joe's have both conventional and organic options, just as your local market may, so you have to be careful about what you are buying: conventional produce from Whole Foods or your local natural foods store is no better than what's in your local market, and it may be much more expensive.

Some large chain supermarkets (such as Hannaford here in New England) have a wide selection of organic produce that is often cheaper than specialty stores like Whole Foods. Regardless of where you buy, it's worth reading food labels, as they will tell you the truth.

Conventional produce (grown with herbicides, fungicides, insecticides and fertilizers) will have a sticker that has a four-digit number that begins with a 4. For example, a conventional grown banana might read 4011. Because 4 digit codes have now been used up, you will begin to see stickers will four digit codes

beginning with the number 3 that are also conventionally grown.

Organic produce has a five-digit code that starts with the number 9. For example, organically grown bananas might read 94011.

Genetically engineered produce (to be avoided) will have a five-digit product code that starts with the number 8, so a genetically engineered banana would read 84011. (Much produce today has been genetically modified, which won't be apparent, but if it was specifically genetically engineered, it has to carry a label starting with 8.)

So anytime you are looking to buy organic, just check to make sure the sticker starts with a 9. Supermarket produce sections can be misleading, so double check to make sure you are buying what you really want.

What You Don’t Know About Produce May Harm You

Each year, almost a billion pounds—or nearly three pounds per person—of pesticides are sprayed across the U.S. Before herbicides and pesticides were introduced 57 years ago, 37% of our crops were being lost to pest damage. Today, despite the pervasiveness of pesticide use, pests are destroying MORE than 37% of our crops.

And it’s not just in the U.S. We import heavily sprayed foods from countries that use chemicals the United States banned long ago. While pesticides have not had any significant effect on crop loss, they have definitely had an effect on our health. I think pesticide exposure levels in our food, water and environment are cause for concern today, but I am even more concerned about the effect they will have on future generations if we don’t start making some changes in the way we grow—and buy—our foods.

In the last chapter, I looked at which fruits and vegetables are the most pesticide-laden and how you can make the best choices when buying fresh fruits and vegetables. Today, I’m going to discuss some of the effects these choices have on our health and look at other issues worth considering, including whether to buy food from abroad.

The Effect of Pesticides on our Health

Pesticides are toxins that can affect our nervous systems and damage our reproductive systems. (Not surprisingly, chemicals designed to prevent pests from reproducing can affect our ability to reproduce as well.) Some pesticides are more harmful to us than others and the extent of their effect on our health depends on which pesticides we are exposed to, in what amounts and at what frequency. Some, like organophosphates and carbamates, affect our nervous systems. Others disrupt our hormones and affect the endocrine system. Some are known carcinogens, while others irritate skin and eyes.

Pesticide exposure can result in both chronic and acute health concerns. Some

of the chronic health concerns include shortened attention span, memory disorders and reduced coordination, early onset Parkinson's disease, reproductive problems, hormonal disruptions and imbalance, birth defects, depression and cancer. (As far back as four decades ago, Miami University did a study on terminal cancer patients and found that in the random selection tested, they all had exceptionally high levels of pesticide residues in their liver, brain and fatty tissues.)

Some of the acute conditions pesticide exposure can trigger include blurred vision, headaches, eye problems, skin conditions, seizures, diarrhea, nausea and wheezing. Mild to moderate pesticide poisoning can even present symptoms similar to asthma, bronchitis and gastroenteritis, especially in children.

Children are particularly susceptible to these problems because of their developing body systems. CNN reported recently on new research that children across the U.S. who eat typical kid-friendly foods like frozen blueberries, fresh strawberries and celery had twice the likelihood of receiving an ADHD diagnosis. (Previous studies focused primarily on communities of farm workers and found that exposure to pesticides led to behavioral and cognitive problems in children.)

Researchers analyzed the urine of over 1,000 children and found that the kids with above average levels of one common pesticide byproduct, malathion, had double the chance of receiving an ADHD diagnosis. Since pesticides are designed to have toxic effects on the nervous systems in order to kill the pests, researchers concluded it is not a stretch to imagine that these chemicals can have an effect on the nervous systems and brain chemicals of children exposed to them.

We are all born with some pesticide exposure in our systems passed to us in utero. We add to that through our daily food and water choices and our environmental exposure. Some of us are more susceptible because of our genetic makeup or higher in utero exposure levels, but all of us can manage our pesticide exposure by making better choices.

I think our pesticide exposure through food, water and environment is so pervasive today that we should all try to minimize our exposure. If you have kids,

are pregnant, have a compromised immune system or make lifestyle choices that you know place greater burden on your liver, it is even more important to pay attention to your food choices and avoid “the dirty dozen” most heavily pesticide-ridden produce and buy organic instead.

Buying Food From Abroad

In generations past, we ate along with the seasons, varying our diet depending on what grew at that time of year. Today, we eat much more limited diets, as many of us tend to eat from the same food groups repeatedly with little deviation. As a result, we eat our favorite fruits and vegetables year-round.

This practice not only restricts our diets and limits our exposure to the many other fruits and vegetables available each season, but it has also resulted in big business for international produce exports. The importation of fruits and vegetables raises a number of concerns about the carbon footprint of our foods, the use of pesticides illegal in the U.S. that are still being used in foreign countries and the nutritional value of food that is picked before it is fully ripe so that it can make the long journey to us before it spoils.

Though the U.S. has banned the use of some known carcinogenic chemicals in our food production process, several developing countries routinely use such chemicals in farming.

Just one example of this (and sadly there are many more) is the pesticide DBCP or Dibromochloropropane. In the late 1970s, workers at a pesticide plant in California discovered that DBCP exposure had rendered them sterile. Some companies stopped production while an investigation was undertaken, but some did not. (One company, Amvac, told its stockholders that they would continue to sell it even though it had suspected carcinogenic and mutagenic properties because a vacuum existed in the marketplace during the investigation and they hoped to take advantage of it.) After a two-year investigation, the Environmental Protection Agency concluded that DBCP does cause sterility and it was banned for use in the United States.

However, just because a chemical is banned in the U.S. does not mean there are restrictions abroad. In this case, DBCP is sold to Coast Rica, Honduras and

Ecuador for use on banana plantations and then that produce is sent back to the U.S. for consumption. (Dole recently made the news with a lawsuit from banana plantation workers related to sterility from DBCP; it's still being used in banana production today.)

One recent test indicated that bananas from Central and South America revealed 45 pesticides that are "allowable" by FDA standards as well as 25 prohibited pesticides and 37 additional poisons that the FDA does not test for. The FDA rarely refuses entry to produce or seizes any shipments, so there is little reason not to spray heavily. (One Mexican farmer stated that because Americans want blemish free produce and won't eat items with insect marks, they spray four times as much pesticide on any produce destined for the U.S. than for any other location.)

If the FDA does test a produce sample, they remove a small section but send the rest to market while the tests are being run. So if they do in fact find excessive pesticide levels or other concerns like unknown poisons, there is little consequence because the American public has already consumed the produce by the time it is discovered.

In addition, the nutritional value of foods that travel long distances is often compromised. In order to make it to market prior to spoiling, fruits and vegetables are picked early, before they are ripe, and then sprayed to protect them from ripening too soon while still in transit. Food that is picked early before it fully ripens is not fully developed and its enzyme profile is different than that found in a mature, ripe version.

For example, unripe fruit has an insoluble form of pectin known as protopectin. But as it ripens, enzymes make the pectin soluble. In the case of fruit or vegetables from far away, they may never reach their ripe and mature nutritional state because they are sprayed to delay ripening and we consume them prior to that ever occurring or because the chemicals sprayed to prevent them from ripening on their journey effectively prevent them from ever reaching full mature development.

Buying organic reduces our pesticide exposure in foods we eat, but it also

reduces the pesticide exposure in our environment. Pesticides remain in the soil—often for many years—affecting future crops, sometimes even generations later. In addition, spraying results in airborne chemicals that drift over homes, gardens and schools creating health concerns for many people—especially children and those living in rural farm areas.

There are so many great reasons to opt for organic produce, but it is also important to support our local farms and farming communities, as there are greenhouse gases emitted from airfreight to consider. I've heard the argument that buying air freighted out-of-season produce is the equivalent to driving a Hummer.

So how do you decide between an organic apple from New Zealand or a conventional pesticide-laden product from a neighboring farm?

Local versus Organic

This is not an easy question to answer, and one you will have to decide for yourself based on your commitment to local agriculture, your concern about carbon footprints and your tolerance for agrichemicals in your food. I try to support local farming to the extent possible and will choose local produce, even if it's not organic, whenever possible. (Especially if I can talk to the farmer directly at the farm stand or the farmer's market and ask about how the produce is grown.)

The one exception to this is "the dirty dozen" fruits and vegetables discussed in the prior chapter, in which case the harms of the heavy pesticides outweigh any other considerations for me as I have developing children. So when buying those fruits and vegetables (and a few others toward the high end of the list that we eat regularly) organic is always my first priority.

Of course, when possible, getting something local AND organic is always ideal and I try to seek that. But in today's world where time and money are always a consideration, that is not always possible. In the next chapter, I'm going to look at how to make the best choices when you can't get fresh produce and you need to buy frozen or canned versions as substitutes. (You'd be surprised to know how much restaurant food, even at nice restaurants, comes from a can!)

Fruits and Vegetables: Frozen Versus Canned

In the last two chapters, we have covered a lot of ground about making better fruit and vegetable choices, for your body and our planet. While we know fresh local organic fruits and vegetables are the best choice, most of us will need to call on canned or frozen vegetables on occasion because of time and convenience factors or seasonal availability.

So before we leave the subject of fruits and vegetables, I'm going to discuss some important health implications to consider with frozen and canned vegetables and also look at how many servings you should really be eating. Let's start by exploring the important question: Can you get the nutrition you need from five servings of fruits and vegetables per day?

Nutrient Decline in Fruits and Vegetables

Recent studies have shown comparable nutritional value between fresh, frozen and canned vegetables, but for very different reasons. (Nutritional value isn't the only consideration, as we'll soon see.) While experts agree that fresh local vegetables are best, the "fresh" vegetables found in our markets may have been shipped across the country or from around the world, hindering the development of their full nutritional profile. That's because they are picked before they are ripe, so they never develop the full spectrum of vitamins, minerals and enzymes that mature ripening allows. (And as we discussed in the last chapter, if they are not organic, the produce is sprayed with harmful chemicals to delay their ripening and to prevent spoiling, bruising and insect damage.)

In addition, during transport, the fruits and vegetables are exposed to heat and light, which degrades certain vitamins like vitamin C and the B vitamins. Vitamins like C that react with oxygen change chemically so that they no longer work the same way in our bodies; this is called oxidative degradation. One study followed broccoli coming to market and found it traveled 2,095 miles from California to

Chicago: That's about four days if a truck travels 70 mph for eight hours a day. Add in the time from farm to truck and then from warehouse drop-off to market and then to your table and you can see that even domestic produce travels long and far.

It's estimated that fresh fruits and vegetables lose more than half of their nutritional value on the journey from farm to table (when they are not local). This concern is compounded because studies show that the inherent nutritional value of fruits and vegetables has declined significantly during the last 50 years. The vitamin and mineral content of produce is decreasing because of genetic modification, breeding practices that increase volume and cosmetic appeal, ripening systems, storage processes and chemical fertilizers.

Four recent studies looked at data from 1930-1999 in the U.S., Canada and the U.K. Regardless of which time period was looked at or which country, the results were consistent: Nutrient value is declining. As an example, in 1951, a woman could get her full-recommended daily allowance of vitamin A from two peaches. Today, she would have to eat 53 to get that same nutritional content! This is why I recommend everyone take a whole food multi-vitamin, as it is difficult, if not impossible, to get your full nutritional needs from our food supply today, even if you eat really well.

This is also why the Center for Disease Control and the Produce for Better Health Foundation have launched a campaign to increase fruit and vegetable consumption with the slogan "Fruits and Vegetables—More Matters." This campaign replaces the old "five a day," as it's generally accepted now that five servings of fruits and vegetables are simply not enough any more. Seven to 13 portions a day for adults is considered the new standard, though based on the data above, even that may not be enough.

Most of us simply don't eat that much. The USDA guidelines are even lower, suggesting a range of five to 13 servings, but the FDA says that only 11% of Americans meet those levels. Twenty-five percent of Americans don't eat any vegetables and 50% don't eat any fruit on a daily basis.

Without question, the best way to maximize the nutritional value of the produce

you do eat is to buy local (preferably organic) and consume it within a few days. But if we are going to increase our daily fruit and vegetable consumption to the above recommend levels, or hopefully even beyond, most of us are going to have to look to frozen or canned options to get what we need: Fresh local produce in season simply won't be possible year round. So let's look at the issues around frozen and canned alternatives.

Frozen and Canned Vegetables: Are they Nutritionally Comparable?

I've already discussed some of the issues that fresh food faces on its journey to your table and why its nutritional profile may be diminished as a result. A recent study in the Journal of the Science of Food and Agriculture looked at the nutritional value of fresh versus frozen and canned vegetables and found them all to be comparable. While the study is imperfect in that "changes in moisture content during storage, cooking and processing can misrepresent changes in nutrient content" and suggests that a more accurate comparison would be possible if future research expressed nutrient data on a dry weight basis, nevertheless, the study concludes that recommending fresh vegetables exclusively ignores the nutrient benefits available from frozen and canned vegetables.

In the case of canned fruits and vegetables, the thermal treatment in the initial processing can result in the loss of water-soluble and oxygen-labile nutrients such as vitamin C and the B vitamins. But after that, nutrients remain stable due to the lack of oxygen inside the can. Frozen products, on the other hand, lose fewer nutrients initially because they are typically blanched and then frozen within hours of being picked and there is less heat involved in the process. But they can lose more nutrients during storage time due to oxidation. The longer they stay in your freezer, the more nutrients they will lose, so as with fresh, try to consume them on a timely basis, especially after opening the bag.

In the end, both lose slightly more nutrients than fresh produce but the study concludes they are good supplemental alternatives. However, it's important to note that these processes do not alter pesticide residues, so frozen or canned produce is still susceptible to toxin exposure.

In the study we looked at in the previous chapter, (which examined the connection between kids who eat pesticide-ridden fruits and vegetables and the incidence rate of ADHD), one of the biggest offenders was frozen blueberries. While they may escape some exposure due to the fact that they don't need to be sprayed to delay ripening or prevent insect damage in travel, frozen fruits and vegetables still absorb significant amounts of chemicals in the growing process that cannot be washed away.

Even though many pesticides get into the core of the produce and cannot be washed away, you should always thoroughly wash any produce to remove what you can from the exterior. Frozen fruits and vegetables have not been washed and still require careful cleaning before consuming.

And for the "dirty dozen" most pesticide-ridden fruits and vegetables, I still recommend you buy organic versions, even if you buy frozen.

If your supermarket has a separate organic section, you'll find them in the freezer case in that section. Some supermarkets keep all the frozen products together and you can usually find organic versions in the traditional case. (If your market doesn't have an organic section, it's time to find a new market! Regardless of whether you choose to buy organic versus conventional, any market that doesn't give you that choice is not a business I'd want to support.)

While canned vegetables may afford a similar nutritional profile to frozen or fresh vegetables, there is another very important health consideration that makes canned vegetables a less desirable choice: Bisphenol A or BPA. We talked about BPAs in past chapters, including the chapter on making healthier fish choices, but BPAs are a significant concern in the canning of fruits and vegetables as well. I'll discuss the implications of BPAs in canned vegetables in the next chapter.

Canned Vegetables and BPAs

This is the last of four chapters in the fruits and vegetables series. Previously, I looked at picking the right fruits and vegetables, examined how pesticides affect produce, and why frozen fruits and vegetables are better than canned.

One reason why frozen comes out the winner is that canned food contains **Bisphenol A or BPA**, which is a major concern when eating canned fruits and vegetables.

BPA is an industrial compound that has been shown to be toxic even at low doses. It is an endocrine disruptor, which means that it acts as a hormone in the body, taking up space in receptor sites and leaving excess hormones to flow through the body and cause damage. BPA has been tied to numerous health concerns including breast and prostate cancer, infertility, cardiovascular disease, Type 2 diabetes and liver-enzyme abnormalities.

BPA is ubiquitous as it is found in so many places including water bottles, cans, air, dust, office water coolers, printer inks and toners and thermal receipt paper used by grocery stores and gas stations (which can rub off onto the hands and then be absorbed by skin or ingested after contact with the mouth). The CDC found BPA present in the urine in 93% of the U.S. population and the Environmental Working Group found BPA present in the cord blood of newborns.

Avoiding BPA is a positive step toward improving wellness, and while some exposure may be hard to avoid, avoiding canned products can prevent one big source of exposure. Virtually all cans, including those containing fruits and vegetables, soda, soup, baked beans, spaghetti and ravioli and even infant formula, are lined with BPAs. Most tin cans have an epoxy liner made from BPAs (ironically to prevent the interaction of the food with the metal in the can). It's estimated by the FDA that 17 % of the American diet comes from canned foods (and that doesn't account for all the canned foods served at restaurants), so this

is a big area where we reduce can our exposure to BPAs.

The Environmental Working Group tested canned food across the U.S. and found that in more than half of the products tested, there were levels of BPAs 200 times the government's traditional safe level of exposure for industrial chemicals. (There is no safe standard specifically for BPAs. The FDA acknowledges it's a concern and examined BPA levels but failed to set a safe standard level against which to test.)

The National Workgroup for Safe Markets recently released a report titled No Silver Lining that tested a random sampling of 50 cans from across the U.S. and Canada, looking at typical products many Americans might eat on a daily basis. BPA was found in 46 of the 50 products. The highest level ever found in the U.S. was found in a can of DelMonte French Style Green Beans, with a level of 1,140 parts per billion or ppb.

Walmart's store brand (Great Value) of Sweet Peas came in at 329.3 ppb. Healthy Choice Old Fashioned Chicken Soup had 323.6 ppb. Healthy Choice Chicken with Rice Soup had 172.4 ppb. Campbell's Cream of Mushroom Soup had 130.4 ppb and Campbell's Chicken Noodle Soup had 127.5 ppb. The amounts varied by can even among the same product offering, perhaps reflecting the time the product remained in the can.

While again there are no specific acceptable levels of BPAs, the study found that consumption of even one can of food might yield more BPA levels than were shown to cause health effects on developing fetuses in laboratory animals.

Unfortunately, there are no viable alternatives that work across all food products, which poses a manufacturing challenge that has made the industry reluctant to change. Eden Organic is the only company using a BPA-free lining for canned foods that I know of; they bake an oil and plant-based resin onto the cans instead. Muir Glen, another organic company, hopes to be BPA-free within the next year or so. There is one premier fish product, Henry and Lisa's Natural Seafood (Sashimi-Grade Canned Albacore Tuna) that is also BPA free.

But no company has been able to offer BPA-free canned tomatoes due to the acidity of the tomatoes and their tendency to leach more from the metal of the

can. Glass may be an option for pre-made sauces, but keep in mind that manufacturers may purchase canned tomatoes as a base ingredient for the sauce, so they may still contain BPAs from their original content sources.

For those of you who use canned tomatoes, there are options other than using fresh tomatoes. Pomi tomatoes, distributed by Boschi Food and Beverage of Italy, offers tomatoes in BPA-free containers. Their chopped and strained tomatoes are available on Amazon. And Trader Joe's offers tomatoes in cartons that are also BPA-free. Short of preserving them yourself, those are the best options.

Senator Dianne Feinstein, D-Calif., is sponsoring a bill banning BPA from food packaging, allowing for a one-year delay in the ban to enable manufacturers to make the shift. Senator Feinstein stated, "I no longer eat food out of cans. I no longer buy cans. I look for jars." (I am thrilled that she is working to eliminate BPA in cans, though she might suggest eating more fresh local fruits and vegetables instead of opting for those in jars!)

Sadly, in all but five states (Maryland, Connecticut, Wisconsin, Minnesota and Washington) baby and infant products are still sold in BPA-laden cans. Given babies' size and developing systems, that seems criminal to me.

We should all try to avoid BPAs and proactively work to minimize our exposure: Avoiding food in non-BPA-free cans is a great first step. But it's an effort that is even more important for pregnant women and young children.

According to obstetrician Hugh Taylor of Yale University School of Medicine, who studies the effects of BPA on pre-natal development, "Fresh fruits and vegetables may be more expensive, but I believe that the risk is too high not to spend the extra. The entire life of that individual may be altered by a few months of BPA exposure in pregnancy. This is where the greatest risk lies. We are programming the hormonal response of the next generation. The worst effects may not become apparent for years."

One final word before we end this series on fruits and vegetables: Don't let the cautions we've discussed prevent you from eating more fruits and vegetables. Try to get up to 13 servings a day. Fresh, local and organic is always best, but do

the best you can. Definitely choose organic for the “dirty dozen,” even if it means opting for frozen. Buy local mixed with frozen for the rest, with as much organic as your wallet and lifestyle will allow.

Cooking to Maximize Nutrient Value

Now that you are bringing home the best food possible (based on what you've learned from the previous chapters on fruits and vegetables as well as those on dairy, meat and fish), how can you make sure you're getting the most nutrients from that food?

As we learned in the fruit and vegetable series, the nutrient value of today's food is dramatically diminished. Remember the reference to peaches: In 1951, two peaches would supply a woman's Recommended Dietary Allowance of vitamin A, but today she'd need to eat 53 to get the same nutrients?

So with reduced nutrient value, it's more important than ever to ensure that you get all the nutrients you can out of the food you cook—and that you avoid adding carcinogens or chemicals or altering the food profile with your cooking method.

Next I'm going to discuss some of the best ways to prepare food infused with nutrients.

The Best Cooking Methods

Stir-frying is a great way to eat perfectly balanced meals because you can cook protein, carbohydrates (vegetables) and healthy fats (coconut oil or grapeseed oil) in one pan. Using a wok over medium heat and continuously stirring the food allows it to cook while remaining crisp and maintaining nutrient value.

It's important not to let the heat get too high or the oil will oxidize and turn rancid. (If it discolors or imparts a smoky flavor, you've definitely gone too far). I rarely if ever turn my stove dials above three (on a 1-10 scale). You can also use chicken or vegetable broth instead of oil.

Sautéing as it is traditionally done over high heat, is not usually a good choice because the oil is likely to oxidize. But some now call what was once called pan-frying sautéing, and it is a good way to prepare foods as long as the heat stays

low and the oils are healthy ones. To me, it doesn't matter whether you adhere to traditional naming conventions: With my stove dial on three, and using coconut oil, grapeseed oil, or broth, cooking vegetables and/or meats in a skillet is a good alternative to using a wok and probably my most typical cooking method.

Steaming vegetables in a small amount of water in a covered pot (using a basket or colander) is one of the best ways to keep nutrients in your vegetables. Just be careful not to overcook: Vegetables should be brightly colored and slightly crunchy when they are done, not soggy and limp. (Try adding your favorite spice to the water for extra flavor!)

Poaching isn't just for eggs: It's also a way to cook fish, chicken and delicate foods that would not survive a boil. While better than boiling, there is still nutrient loss to the water.

Boiling tends to drain a lot of nutrients, but for some hearty vegetables like potatoes and root vegetables, it makes sense on occasion. It definitely makes sense if you are making soup and are keeping all the nutrients in the broth! Otherwise, try to avoid boiling. If you do boil, try to use the nutrient-rich water in your soup broth, sauce or rice or quinoa.

Pressure-cooking has been revived lately but remains an uncommon means of cooking in the U.S. But because pressure-cooking cooks foods very quickly, it tends to preserve a lot of nutrients and flavor, unlike slow cookers, which result in greater nutrient loss. I don't use my pressure cooker often, but it does create tender succulent fall-off-the-bone meat dishes that convince even the most loyal grilling fans that there is another option.

Baking is not just for pies and cookies; it can be a good way to mix meats and vegetables into a simple meal. Roasting meat and veggies in a pan can also a make a hearty meal. It's not something I like to do in the summer months, but in the winter, baked/roasted meals are comforting in taste, texture and smell.

And for vegetables, I'd be remiss if I didn't mention that one of the best ways to serve them is **raw**. You can drizzle some olive oil and salt on them or create sauces from organic ingredients you have on hand. While my kids love broccoli sautéed in a little oil, they also adore it raw and crunchy. I often set out a raw

veggie platter while I am cooking only to find it completely devoured before we sit down at the table. And that's OK with me!

Cooking Methods to Avoid

Frying and deep-frying probably don't need much of an explanation for why they are unhealthy. In addition to the excess calories and fat, frying at high heats causes oils to oxidize and turn rancid. This causes inflammation, which can result in myriad problems, including high cholesterol, arterial plaque leading to heart disease, and can produce cancer-causing chemicals.

Microwaving is a controversial cooking method and one that I'm going to discuss more fully another time. But research shows that microwaving alters the chemical composition of food and affects the nutrient value. Microwaving poses great health concerns, but for now, perhaps knowing that microwaved broccoli results loses up to 97% of its beneficial antioxidant chemicals, while steamed broccoli loses fewer than 11%, may help you think twice about it.

I recommend you avoid microwaving food to the extent possible. If you do microwave, never use plastic containers, as they have been shown to leach toxic chemicals like Bisphenol A into your food: always use glass or ceramics. (Some ceramics say microwave safe but they are not. One way to test microwave safety is to fill the container with cold water and heat on high power for one minute. If the water gets warmer but the container remains cool, it's ok to use. If the container becomes warm, don't use it.)

Grilling is a great American tradition and I know I'm not going to make friends when I say that you should minimize grilling to the extent possible. While gas is a better fuel than charcoal, and electric is best, anytime you generate a black char line on your food, you are creating carcinogens, or cancer-causing substances, in your food.

And even if you don't char your meat, fat in the meat causes gases to be released when it drips onto the heat source, which pose additional cancer concerns. For that reason, avoid grilling meat. Grilling vegetables and fish without char lines is OK -- use foil or a basket and grill away.

As with everything, balance is key. If you do it on occasion, and live a healthy lifestyle, occasional char-grilled meat isn't likely to cause you much trouble. Nor will using a microwave in a pinch. But if you do it regularly, and/or you have other health issues to address, then minimizing such cooking methods could be a big step forward to improving your wellness.

And one final note: if you are still using non-stick cookware, consider investing in a new set of pans. Numerous studies have shown that the chemicals that create the non-stick pan linings are toxic and leach into the food over time. Ceramic cast iron pans are a great choice as is stainless steel.

5 Cholesterol Myths Shattered

An estimated 102.2 million Americans have cholesterol levels above 200, which is considered borderline high, according to the American Heart Association. About one-third of those have cholesterol levels over 240, which is considered by today's test standard to be in the high-risk zone. And a new study just released showed 41% of Canadians have high cholesterol levels.

We have been told that high cholesterol is bad, that it causes heart disease (the leading cause of death in the U.S.), that we should all be tested for it, and that high levels must be treated, usually with statin drugs. With those assumptions and statistics, the problem would seem epidemic.

But in this chapter, I'm going to shatter five myths about cholesterol and hopefully change the way you think about it forever.

Myth #1: Cholesterol is Bad for You

Cholesterol plays several key roles in a healthy functional body. It keeps cell membranes from falling apart and plays an integral part in cellular repair. Cholesterol is also a vital pre-cursor to many major hormones including testosterone, progesterone, estrogen, cortisol, dehydroepiandrosterone (DHEA) and is required for synthesis of vitamin D.

The body manufactures about 75% of the cholesterol it needs. The rest we must take in from foods. Without adequate dietary cholesterol, the body may divert cholesterol to where it is needed most: cellular repair and healthy function in key areas, especially the brain. When this happens, there may not be enough left for use in hormone synthesis, which can cause hormonal imbalance.

This is why some people (especially women going through perimenopause) who do not eat enough cholesterol may experience more severe hormonal reactions

and symptoms.

In fact, the body has a built-in mechanism to increase its cholesterol production to override a severe shortage. In extreme cases, when cholesterol is not being consumed in appropriate levels, the liver will step in and actually overproduce cholesterol. If you were to be tested at that time, your cholesterol levels could be considered high, even though you would actually be cholesterol deficient.

But that's not the case for most of us. So for those of us eating healthy diets with moderate amounts of fat, how concerned should we be about cholesterol in food?

Myth #2: High Cholesterol Comes from Eating Foods High in Cholesterol

Despite popular belief that it's the cholesterol in your food that influences cholesterol in the bloodstream, according to the Harvard School of Public Health, it's actually the mix of fats in your diet that's important.

Saturated and trans fats (often called "bad" fats) increase the risk for certain diseases while monounsaturated and polyunsaturated (often called "good" fats), do the opposite—they are good for the body and heart, and cells need them to help manage what goes in and out of cell membranes.

Cells need fat and cholesterol to function, but fat and cholesterol can't readily travel through the blood. So the body combines them with protein-covered particles called lipoproteins. Lipoproteins can carry a good amount of fat and travel easily through the blood. There are three types of these particles that are important: low-density lipoproteins (LDL), high-density lipoproteins (HDL) and triglycerides.

Low Density Lipoproteins (LDL)

LDL is responsible for taking the cholesterol from the liver to the body's cells. Once the lipoprotein reaches the cell, the cell attaches to it and extracts the fat and cholesterol it needs.

High-Density Lipoproteins (HDL)

HDL then takes over and plays clean up, collecting cholesterol from the bloodstream, LDL and artery walls, and transporting it back to the liver to be recycled, an equally important role in healthy cholesterol function.

Triglycerides

Triglycerides are the body's main method of transporting fat to cells. They make up most of the fats you eat and that your cells use. They are an important part of healthy body function, but in excess they can cause problems. If your triglycerides are high, you have a lot of fat in your bloodstream, which means you are either making too much or are unable to burn it.

Myth #3: There is Good Cholesterol and Bad Cholesterol

Despite needing LDL, it has been argued that when there is an excess of it, particles can be deposited in the walls of the arteries of the heart and elsewhere, limiting blood flow. The deposits, known as plaque, can break apart and cause a heart attack or stroke. Because of this, LDL has been called the "bad" cholesterol.

The truth is, there is no good and bad cholesterol. There is only one cholesterol: LDL and HDL are lipoprotein cholesterol carriers and they are both equally necessary for survival and wellness.

While LDL has been labeled bad because it can cause plaque development, we now know that there are many types of LDL. In fact, if we want to create labels for good and bad, we could argue there is good LDL and bad LDL. Research has shown that LDL particles come in different sizes and that the large LDL particles cause no problem. The small, dense LDL particles can be troublesome, as they are tiny enough to squeeze through the lining of the arteries.

If they oxidize, or turn rancid, they can cause inflammation, which can lead to many if not all of our chronic conditions. C-reactive protein tests measure general levels of inflammation and can be an early warning sign to take action. Inflammation can be reduced through dietary changes such as increased consumption of vitamin E and fish oil.

Myth #4: Cholesterol Causes Heart Disease

We have known for a while that there is a correlation between cholesterol and heart attacks, but is it causal?

Research now shows that damage to the lining of arteries (such as what can occur when small dense LDL squeeze through and oxidize) causes the coronary heart disease associated with heart attacks. The damage causes inflammation and it's the inflammation that leads to the heart attacks.

How does this happen? Let's look briefly at the inflammatory process.

When you cut yourself, the damaged tissue releases chemicals to start inflammation. Blood vessels constrict to slow down bleeding. Blood thickens so it can clot and cells multiply to repair damage and facilitate healing while the immune system calls on cells and chemicals to protect against viruses and bacteria from attacking the cut.

This is very similar to what occurs within the arteries. As damage occurs, chemicals are released to begin the inflammatory process. Arteries constrict, blood begins to clot, the immune system sends help, and nearby cells are told to multiply. As this process occurs over and over again in the artery lining, scars called plaque form. Over time, blood thickening and artery constriction combine to make a heart attack or high blood pressure more likely.

So remember the first step after trauma: Chemicals are released to begin inflammation and start the healing process. Enter cholesterol, whose primary function is cell repair. Cholesterol is sent to help repair the damaged tissue in the artery linings and elsewhere: it is actually helping your body heal to keep you alive.

Now if this process is occurring repeatedly, cholesterol is continually being manufactured or recycled in order to facilitate the healing process. When tested, your cholesterol levels will seem high.

Because your body needs cholesterol to heal, what effect will lower levels have on the body?

Instead of trying to deal with the symptom, the high cholesterol, we need to look at the cause: The inflammation that is being caused by excessive and/or repetitive damage, particularly from small dense LDL particle oxidation.

Pomegranate has also been shown to be highly effective as an LDL anti-oxidation agent. Subjects taking pomegranate supplements in a clinical study were able to reduce artery thickness by 35%, increase blood flow by 45% and improve markers related to LDL oxidation by up to 130%.

As you can see, the connection between cholesterol and heart attacks is correlated but not causal. High cholesterol may not be anything to worry about; it may in fact be an important component of your body's healing mechanism. The real focus should be on reducing high LDL levels and preventing its oxidation.

If you decide that you must take action to lower your cholesterol, there are two ways to do so: Change your diet and/or take statins.

Myth #5: Statins are a Safe and Effective way to Lower Cholesterol

A January 2008 cover story in *Business Week* concluded that there isn't much evidence to support taking statins.

Upon review of statin data, a leading physician and professor at the University of British Columbia found there is no benefit in people over age 65 no matter how much their cholesterol declines and that there was no benefit to women at any age. Middle-aged men who took statins saw a small reduction in heart attacks, but no overall reduction in deaths or illnesses requiring hospitalization even though their "bad" LDL cholesterol went down.

The only time the drugs were seen as effective was with patients who had already had one heart attack, as it reduced the likelihood of having another. He concluded, "Most people are taking something with no chance of benefit and a risk of harm."

But what about the marketing hype the pharmaceutical companies put out? Let's read the small print on Lipitor's claim that it reduces the risk of heart attack by 36% … in patients with multiple risk factors for heart disease. It says, "That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to 2% of patients taking Lipitor."

In other words, out of every 100 people, three on placebos and two on Lipitor had heart attacks. That means that to spare one person a heart attack, 100 people had to take Lipitor for more than three years while the other 99 got no benefit. A useful statistic known as the NNT, or number needed to treat, means the number needed to treat in this case for one person to have any benefit is 100. Several recent studies have shown that the NNT for statins may be even higher: 250 or more for lower risk patients.

Dr. Jerome R. Hoffman, professor of clinical medicine at the University of California at Los Angeles, put it this way: "What if you put 250 people in a room and told them they would each pay $1,000 a year for a drug they would have to take every day, that many would get diarrhea and muscle pain, and that 249 would have no benefit? And that they could do just as well by exercising? How many would take that?"

It's true that statins can lower cholesterol levels by (guess what?) reducing inflammation! Statins might be acceptable solutions if they were shown to be completely safe, but they are not. Statins have common side effects including muscle pain, cognitive impairments and sexual dysfunction and have been shown to increase cancer risk in rodents.

The *Business Week* article posed this question: What would work better?

Prescription: Change Your Diet

The answer, not surprisingly, according to Dr. Jerome R. Hoffman, professor of clinical medicine at the University of California at Los Angeles, is not a pill but rather diet and lifestyle changes. Several studies have shown that lifestyle changes, such as switching to the Mediterranean diet and eating more fish, brought greater declines in heart attacks than statins.

If you still want to lower your cholesterol levels, in addition to fish and omega-3s, walnuts and soluble fiber like oatmeal have been shown to be effective cholesterol reducers and most of us need more fiber in our diets anyway. Niacin (or vitamin B3) also lowers cholesterol and triglycerides and it recently outperformed Merck's drug Zetia in arterial plaque prevention (resulting in Merck canceling the study.)

Physical fitness also plays a role with exercise and lifestyle changes such as stress reduction, diet changes and weight reduction.

Keep in mind that your doctor had little, if any, nutrition training in medical school and may not be comfortable guiding you in this regard. In addition, some physician friends tell me they are reluctant to suggest dietary changes because they find that people don't always stick to them. So you may have to take the initiative with your physician to get the right plan in place for you.

Studies prove that the anti-inflammatory aspects of the Mediterranean diet and fish or fish oil, combined with a healthy lifestyle and reduced stress, are the most effective prescription for wellness, in the arteries as well as in the rest of the body.

Vitamin D: Is it a Miracle Cure?

The A, B, C's of Vitamin D

Too Much of a Good Thing?

Not Your Grandmother's Cod Liver Oil

Winter can be long. Thankfully, here in New England, we do get bright sunny days. (Unlike Detroit where I spent several gray winters craving sunshine due to "lake effect.") But the days are short and it is hard to get out and experience sunlight if you work a traditional schedule.

I took my kids on vacation for school break this February and it was amazing how much better we all felt once we had some time in the sun. It was not just about being away and relaxing; I felt noticeably better–physically and emotionally -after experiencing the sunshine on my skin.

Vitamin D, the sunshine vitamin, has been getting a lot of press lately, and for good reason. While we have always known it helps with bone health as it facilitates calcium absorption, new research is proving that higher levels of the vitamin have an impact on immune health and protect against cancer, heart health, autoimmune diseases, depression, periodontal disease, diabetes and a host of other conditions.

While adequate levels are shown to be protectors against many conditions, low levels, or deficiencies, are now linked to concerns with these same systems and conditions. Studies now show that vitamin D deficiency is rampant and far more pervasive than previously believed.

Many experts say increasing your vitamin D levels may be the single most important thing you can do to improve your health.

What is Vitamin D?

Interestingly, vitamin D is not really a vitamin; it's actually a group of prohormones. The two major forms are known as vitamin D2, known as ergocalciferol, and vitamin D3, known as cholecalciferol. Vitamin D is one of the four fat-soluble vitamins, which means it is absorbed with the help of lipids (fats) in the intestinal tract. This means that without adequate fat present, the body will not absorb vitamin D. It also means that unlike water-soluble vitamins, which are not readily stored, excess vitamin D can be stored in fat and muscle tissue for future use.

The vitamin D the body receives from food, supplementation or sun exposure is inert and undergoes two reactions in the body in order to become active. The metabolic product created from this process, calcitrol, is a hormone that is said to target over 2,000 genes. That is about 10% of all human genes; no wonder some call it the miracle cure!

A Return to Rickets

Vitamin D deficiency is so rampant now that a recent report in the British Medical Journal revealed the return of a condition common in Victorian times known as rickets. Rickets is a disease affecting growing children whose bones do not harden or set appropriately due to insufficient vitamin D. This once common condition disappeared in developed countries upon discovery that minimal levels of vitamin D would prevent it, but it has now returned.

A new study recently published in the journal Pediatrics here in America revealed that as many as two-thirds of all children are deficient in vitamin D. Among darker-skinned populations the deficiency is even more rampant, with as many as 92% of black children being deficient and as many as 80% of non-black Hispanic children being deficient.

These numbers are based on the new target minimum of 75 nanomoles per liter (nmol/L)._(Until recently, the standard minimum had been considered 50 nmol/L but many researchers have recently suggested that level be raised.)

According to the Vitamin D Council, however, the recommended minimum

vitamin D dosage is actually much higher. They cite recent research that indicates that below 100 nmol/L, the body uses vitamin D up as quickly as it is created. At between 100 and 125 nmol/L, some people begin to store vitamin D, but others do not. At 125 nmol/L, virtually everyone begins to store excess vitamin D in fat and muscle tissue.

The Vitamin D Council considers numbers below 125 to indicate “chronic substrate starvation” and recommends a range of 125-200 nmol/L. (Using these numbers as a baseline, I would venture a guess that virtually everyone tested in that study would be deficient.)

Vitamin D is used to support the immune system and protect against so many conditions that the presence of any health concerns in the body may well warrant a need for an increase in availability. If your body is fighting cancer or heart disease, or looking to recover after a strenuous workout, how much more vitamin D might you need? We don’t yet know those answers, but we can certainly imagine that there might be cases where the body needs much more.

Whether you choose to follow the recommendations of the Vitamin D Council or to be more conservative and follow more traditional guidelines, it is likely that you need to raise your vitamin D levels.

How do I measure my Vitamin D levels?

The only way to reliably know how deficient in vitamin D you might be is to have a simple blood test performed called a 25 hydroxyvitamin D test or a 25 (OH)D. Your doctor can do this easily and most insurance plans should cover it. Many doctors will still consider significantly lower numbers to be acceptable (keeping up with the emerging research can be a full-time job and your doctor already has a full-time job); if so, it will be up to you to share information and partner with your physician to find the right level for you.

If your physician will not test you for vitamin D, you can order a test from the Vitamin D Council on its Web site. You complete the test and mail it back for accurate results (in all states but New York, which prohibits testing of specimens collected in or mailed from New York and prohibits data transmission from the lab to New York physicians or residents.) The test costs $65–or $220 for four if you

want to test periodically or test more than one family member.

The tests will tell you your current levels, but from there you will need to figure out how much supplementation you require to get you to where you want to be.

How much vitamin D do I need?

Generally speaking, we know that the darker your skin, the bigger you are and the less daily sunshine you receive, the more you will need.

While current FDA guidelines suggest a vitamin D level of 400 International Units, or IUs, per day, many researchers and physicians have increased their suggested optimal adult vitamin D level to around 5,000 IUs per day. I have also seen a formula used that indicates a body needs 35 IUs per pound of body weight, which allows for variance for children and heavier people.

Supplementation at the 5,000 IU level has been shown to bring vitamin D into the desired nmol/L range for many people. But because vitamin D is used to fight cancer, regulate the immune system and myriad other functions, there can be a need for much more depending on what is going on in your body. Some studies have revealed that certain individuals need as much as 25,000 to 30,000 IUs just to reach a consistent rate of 125 nmol/L!

Vitamin D needs are individual and must be customized. That's why it is recommended that you test in order to be sure your supplementation is adequate for your own body's needs. It is recommended that you begin supplementation first and consume vitamin D regularly for two to three months before you have your levels tested in order to see how effective your dosing is for you. (If you feel more comfortable testing first, that's fine. Just know that you may need to test several times in the process.)

Unless your climate remains constant year round, you will probably want to test in summer and in winter to get a sense of the shifts in your body and how the season changes affect your dosage levels. People who avoid the sun as well as those with darker skin pigmentation will likely need to increase their dosage, especially in winter.

Too Much of a Good Thing?

According to the Vitamin D Council, even at the new recommendation of 125-200 nmol/L (much higher than most doctors will be familiar with), those ranges are still very conservative. But because excess Vitamin D is stored in fat and muscle tissue, there have been concerns about toxicity from over consumption.

While we should always be aware of such possibilities–and that is yet another reason to work with your doctor and get tested regularly–the risk of toxicity is much less than previously believed. Because the body is geared to produce very high levels of vitamin D from our daily sun exposure, we have the capacity to absorb very high levels.

Typical summer sun exposure of 20 minutes (without sunscreen and with face, arms and legs uncovered) yields 20,000 IU of vitamin D. We didn't have sunscreen until recently; our bodies were built to be in sunlight for much of the day (building up our sun exposure to prevent burning of course.) So we are engineered to produce and absorb very high levels of vitamin D. And we also have a built-in safety mechanism: After the body produces about 20,000 IUs of vitamin D, the sunlight, begins to break it down, preventing the body from excess. And once we are tan, the body naturally adjusts and makes less, producing only about 10,000 IUs.

But oral consumption is different: Can we overdose on vitamin D? While pharmacological overdoses of vitamin D2 have been documented, the same is not true for vitamin D3. Research conducted to determine toxic excess in animals revealed that the dose of vitamin D3 it takes to kill half the animals when tested in dogs was about 3,520,000 IU/kg. (Yes, sorry, they did in fact test this on animals.) That is estimated to be about 176,000,000 IUs taken by a 110-pound human.

Leading researcher Dr. Reinhold Vieth suggests that toxicity may possibly begin to occur after chronic daily consumption of 40,000 IUs a day. Clearly there is a great deal of room between the minimum guideline of 5,000 IUs and long-term daily consumption of 40,000 IUs.

Vitamin D Co-Factors

The body needs several substances to utilize vitamin D appropriately. These co-factors include magnesium, zinc, boron, vitamin K2, genestein and a small amount of vitamin A.

I believe many people are magnesium deficient (because calcium and magnesium partner together and so many people supplement calcium but neglect magnesium–I'll discuss magnesium more in a future newsletter) and because of that, magnesium is an important consideration in vitamin D supplementation.

If you struggle with reaching optimal vitamin D levels after supplementation, a magnesium deficiency could be the reason why. At the same time, as you supplement with vitamin D, any existing magnesium deficiency could be exacerbated.

So paying attention to the co-factors, especially magnesium, is an important component of successful vitamin D absorption.

Walking on Sunshine

The best way to increase vitamin D in your body is through sunshine. Exposed skin in summer sun for 20 minutes will give your body its daily dose. But unless you live in southern Florida, you won't be able to get what you need year-round from sunlight alone and you'll need to supplement, at least during winter months.

Tanning Beds

Tanning beds emit both UVA and UVB rays. However, the body is only interested in the UVB rays for vitamin D synthesis. UVB rays are shorter and affect the surface layers of the skin and as a result, can cause sunburns. The dark tans that come from tanning beds result mostly from UVA rays. Therefore, most tanning salons calibrate their beds to produce mostly UVA rays (often as high as 95% UVA) and minimal UVB.

Not Your Grandmother's Cod Liver Oil

It is possible to get vitamin D from foods such as salmon (wild sockeye is best;

not farm raised), mackerel, herring, sardines and catfish. But a standard portion of these foods will only yield about 250-350 IUs, so you'll have to eat a lot!

Grandmother's remedy of a tablespoon of cod liver oil is a highly effective form as well; it yields 1,360 IUs. (Many companies now flavor the oil with lemon or orange so that the taste is not like what you might remember; my kids will even eat it and they can choose between oil and pill form.)

Choose a brand that has been tested and found to remove contaminants such as mercury and PCBs, which can be present in fish.

Cod liver oil, however, also contains vitamin A, another fat-soluble vitamin that some suggest has toxicity concerns at high doses. I believe that in time research will show that–similar to vitamin D–high doses of vitamin A from *natural sources* are safe. For now, if you have concerns about excessive vitamin A, rather than quadrupling the dosage of cod liver oil to get to 5,000 IUs, you'll want to consider D3 supplementation through pills, sprays or oils.

Studies show that vitamin D2 is only about 20%-40% as effective in supplementation as vitamin D3. Many over-the-counter vitamin D supplements–and virtually all prescription forms–contain vitamin D2. But D3 (cholecalciferol) is widely considered to be a more effective source, so read the label carefully.

And don't be afraid of 15-20 minute breaks in the sun without sunscreen (we'll talk about the myth that it will cause skin cancer in another newsletter). You will feel energized and renewed and many systems in your body will be thankful.

Bone Health: It's Not All About Calcium

There are 206 bones in the human skeleton that support and protect our internal organs and perform a number of important functions. But we rarely give them much thought unless we break one and we have to learn to function without it. When you're a kid, it can be a cool badge of honor, but as an adult, it can wreak havoc with your life.

A few years ago, I broke my right wrist so severely that I now have a four-inch plate and two screws where my wrist bone once was. I was at the roller rink with my kids when a boy lost control and knocked me over. The accompanying nerve damage was excruciating and learning to bathe, dress, cook and take care of my little kids without the use of my wrist was quite a challenge.

It took me almost a year to fully recover, and as a result, I'm even more conscious of my bone health now.

If you're struggling with wear and tear on hips or knees or perhaps you're concerned about bone health and osteoporosis as you age (or you have a friend or family member who is), there is much you can do to prevent and even repair bone damage. Today I'm going to explore how you can avoid drugs, replacement surgeries and debilitating fractures as you age, and have strong healthy bones for life.

How our Bones Work

Our bones are meant to last: Exhumation at burial sites thousands of years old reveals intact skeletons. Ancient societies' medical records reveal no issues or concerns with bone failure as people age. So what has changed?

Bones are continuously being built up and broken down. In fact, the entire human

skeleton is replaced every 10 years. There are two types of cells in the bones needed to complete this task: Osteoblasts, which produce new bone, and osteoclasts, which are responsible for removing damaged or unnecessary cells from the bones. These cells work to structure your bones as you grow, to regulate calcium levels in the blood, and to repair stresses and damage from daily function.

In addition, almost all of our hormones, including testosterone, estrogen, progesterone, cortisol, thyroid hormones and growth hormones have an effect on bones. We hear a lot about women being at risk for osteoporosis post-menopause, when estrogen levels in the body fall; clearly the hormone connection is real.

Osteoporosis occurs when bone tissues thin as we age, resulting in a loss of bone density. We have been told that osteoporosis is a problem. But is how dense your bones are really that important? If your bones are thin, but they support you through your life and never break, is there a reason to be concerned?

Or, if it's actually fractures and their impact that is the real concern, is there a direct correlation between thin bones and fractures that we need to manage? Research indicates that there are many people with thin bones who never experience fractures and many people whose bones are dense who still succumb to fractures.

Thanks to aggressive marketing campaigns, everyone knows of the connection between calcium and bone health. I cringe every time I go into my kids' schools and see posters of athletes and pop stars with white mustaches. The U.S., Australia, New Zealand and most of Western Europe are the largest consumers of dairy in the world. Yet we have more fractures than people from Asia and Africa. In fact, the populations of Africa and Asia consume almost no dairy, but have fracture rates 50%-70 % lower than ours.

Calcium may play a role, but clearly it is not enough on its own. (Of course, there is the question of can we actually absorb calcium or any nutrients from today's dairy products, which is discussed in the chapter on making better diary choices.)

Let's look at how bones are structured. Bones are made of an interwoven lattice-like structure: a collagen matrix. This makes up about 35% of the bones and it is what gives bone its flexibility. This matrix forms the base that then traps calcium phosphate, a mineral salt, which is also known as hydroxyapetite. Hydroxyapetite forms about 65% of bone mass and it is what gives bones its strength. Bones are also the depositories of many minerals that the body needs such as sodium, potassium and magnesium.

Tests measure bone density. But if you fall, what determines whether your bones fracture? Is it the density of the bone? If so, why don't we see that thin bones consistently fracture and that dense bones do not?

Perhaps it's not how thick the bone is, but rather, how flexible the collagen matrix is and how able it is to support you when you fall or find yourself out of your natural alignment. Caring for bones means more than just calcium and bone density; it means ensuring the flexibility of the collagen web.

If collagen is the key, that would explain why density isn't directly related to fractures. It would also explain why cultures that consume healthy diets rich in collagen and the nutrients required to produce it such as the populations of Asia and Africa have significantly fewer fractures than Western (collagen-deficient) dieters.

What About Bisphonates?

Osteoporosis drugs known as Bisphonates (such as Fosomax, Actonel and Boniva) work in two ways: by preventing bone perforations that can weaken structure and by inhibiting the osteoclasts, the cells that break down old bone. Normal bone processes includes resorption, in which old bone is cleared away. But osteoporosis drugs prevent that process, so that the old bone stays around longer.

Instead of a natural process that renews the bone skeleton every 10 years, the old bone is kept around. During the first year, new bone keeps getting built, which is why many people see such great results short-term from bone building drugs. But after a while, that process peaks and just as the bone resorption

stops, so does the bone creation. Somehow the osteoblasts that build bone are repressed by the bisphonates and the natural process is halted.

New research reveals that many people on these drugs have spontaneous fractures that are not trauma related but simply bones breaking while walking up stairs or performing normal daily routines. Ultimately, the old bone buildup and the lack of new bone growth may make the bones even more brittle than they were before!

When we looked at cholesterol, we talked about the “number needed to treat,” or NNT. (Some scientists say anything over 50 is like buying a lottery ticket.) A study of post-menopausal women showed that twice as many of the high-risk fracture group (history of a previous fracture and low bone density) on placebos had a fracture versus those on the drug Fosamax. This study result allowed Fosamax to claim a 50% reduction in fractures. But just as in the cholesterol fine print, we need to dig deeper to understand what that means.

The study shows that 2.2% of the placebo group had a fracture versus 1.1% of the Fosamax group. The net result of risk reduction was 1%. For every 100 women treated, 99 got no benefit. Those 99 would be much better served with diet and exercise changes given all the side effects of these drugs, including irregular heartbeats, increased fractures of the femur (isn’t that what we are trying to prevent?), ulcers and upper GI irritation, joint, bone and muscle pain, and rare but serious jaw bone decay.

So if drugs aren’t the answer, what can we do? The answer lies in exercise and diet.

Exercise: Get Moving

Weight bearing exercise is critical to bone strength. As a cycling instructor, I paid attention when a cycling magazine reported that they looked at the bones of professional/serious cyclists and found men in their 50s with hip bone density similar to that of elderly women. There is something about the cycling movement that grinds the hipbone and if you ride to excess without weight bearing exercise, it takes its toll on your hips.

Cyclist or not, we all need to walk, run, hike, dance or climb stairs to get some weight-bearing exercise. And we should also work on strength training. While lifting weights can be done in a gym, you can also use household or kitchen items and perform body weight exercises such as push-ups or squat into a chair in your living room without weights or gym memberships.

And since fractures have a lot to do with flexibility, stretching is key. The hip flexor muscle in particular needs to be flexible enough to respond should you fall out of normal alignment. Yoga and tai chi can be helpful, but you can just lie on the floor and stretch at home, too.

Balance training can also be helpful: The better your balance, the less likely you are to tumble and end up in a position that could result in a fracture. Try standing on one foot without holding onto anything. If that's easy, close your eyes. Practice over time and your balance will improve: You'll be able to hold that pose for longer periods of time with greater stability.

Bone-Building Diet Options

The complex interplay of minerals and nutrients for bone health means that dietary answers are not as simple as taking more calcium. **Calcium needs approximately 16 other nutrients in order to be utilized by your body and dairy calcium does not deliver those nutrients.** So using dairy as a source of calcium is not helpful unless you also consume a wide variety of plant foods to access those other nutrients. But since calcium can also be delivered through those same plant foods, increasing dairy is ultimately unnecessary.

While improving calcium through increasing plant food consumption may be of some help, it is not enough. Collagen -- and the vitamin C required to make it -- are critical. In fact, some researchers have suggested that vitamin C is as integral to bone health — or given our deficiencies, perhaps even more so — than calcium. Vitamin C stimulates the enzymes that create the connective tissue and the collagen. But collagen also requires adequate protein for formulation. A deficiency of either one -- protein or vitamin C -- may weaken the collagen matrix and prevent the calcium salts from being retained.

Man is one of the few mammals that cannot make vitamin C in its liver, so we

must ingest all our daily vitamin C requirements. Vitamin C is not stored in the body, so it must be continually replenished.

The prior Recommended Daily Allowance of vitamin C of 60 mg was chosen as the minimum level needed to avoid scurvy, a disease that occurs when we are extremely vitamin C deficient.

Researchers now recommend that we get a minimum of 200 mg of vitamin C a day, though a recent study on college age men showed they needed as much as 1,000 mg a day. 200 should be sufficient for most of us, but getting that amount means at least five servings of fruits and vegetables. We know about citrus fruits like oranges and grapefruits, as well as berries like strawberries and raspberries, but vegetables are good sources of vitamin C as well, and without the blood sugar impact. Dark green leafy vegetables like kale, spinach, collard greens and asparagus are all good sources of vitamin C.

Because we can't store it, that means we must get at least 5 servings throughout the day, and I don't know a lot of people who get five servings of dark green leafy vegetables a day! But without regular and consistent vitamin C consumption, our collagen matrix can be compromised. A weakened collagen "web" means we can lose the flexibility required to avoid a bone break and our risk of fractures will increase.

Vitamin D is also required for calcium absorption (so we need to get our daily dose of sunshine), as are a host of other minerals including phosphorus, magnesium, boron, copper, manganese, silica, zinc, folic acid and vitamins B12, A and K.

Its best to get these minerals through a whole plant food diet: dark green leafy vegetables, beans, nuts, seeds, seaweeds and some fish. But if you can't do that, a whole food supplement can help bridge the gap. (Just note that with vitamin C, you will want to consume several smaller doses a day instead of one larger one.) We also need the presence of healthy fats (omega-3s) to perform all the necessary body functions around vitamin absorption.

Finally, it's important to know that an overly acidic diet will weaken our bones. Acid-creating foods such as alcohol, sugar, flour, grains, meat, fish, poultry and

eggs pull calcium and other minerals out of teeth and bones. We need to have some of these foods, as we need protein to support collagen as well. But many of us are out of balance from excessively large meat portions coupled with excess sugar and white flour and not enough healthy fats.

Restoring the acid-alkaline balance is the goal. The more minerals there are in a food, the more alkaline it is; eating fruits, vegetables, seaweeds, salt (note: not iodized salt or excessive sodium through processed food, but natural untreated salt such as himalyan or sea salt) and other alkalizing foods can help balance out too much acid and support our natural healing and bone repair process.

Managing Stress: It's Not as Hard as You Think

What is Stress?

Just Breathe

Recently, we had a severe storm in New England that knocked out power lines across the region. I lost my power on a Thursday evening and the kids and I did homework by candlelight. It was kind of fun sitting together in the dark without the normal daily distractions. We talked about a lot of things, including what it must have been like for kids years ago to eat and do homework by candlelight with no TV, radio, Nintendo DS or Wii.

While some in the area began to get their power back on Friday, we remained without power until late Sunday afternoon. Over the weekend, I had planned to write this section about managing stress and some other pieces as well. Instead, I dealt with water in my basement and no heat, electricity or water where I needed it! So this week, as we talk about managing stress, I can assure you I have practiced what I will preach in this chapter.

It has been estimated that 75%-90% of visits to primary care physicians are for stress-related concerns. Stress was called the "Epidemic of the Eighties" by Time Magazine and was referred to as our leading health problem at that time. But many studies confirm that Americans today believe they are under even more stress now than they were a decade or more ago. Stress is pervasive in our busy lives and stress definitely affects our health.

But it doesn't have to. There are simple techniques I will explore in this chapter that you can use to release stress in order to find peace in the moment -- and to restore balance to your body over time.

So many of my friends tell me they are stressed out: no time, running around in

circles, feeling they are always behind, feeling like there is no time for themselves. One friend told me she got a gift certificate to a spa from her partner for Valentine's Day, a break she sorely needs. But she was certain it would remain unused -- at least until summer -- because she simply had no time to fit in such an indulgence.

We want to be super moms and amazing dads while still holding down our jobs and fulfilling all of our commitments and obligations. But as the flight attendant on the airplane instructs you, in case of an emergency situation, you should put the oxygen mask on yourself first before assisting any other passengers. And that is equally true in life.

If you are run down and exhausted, stressed and tired, you cannot truly give of yourself until you re-charge and re-fill your own gas tank.

According to Brian Luke Seaward, a leading expert in managing stress, *"In Eastern philosophies, stress is considered to be an absence of inner peace. In Western culture, stress can be described as a loss of control. Noted healer Serge Kahili King has defined stress as any change experienced by the individual. This definition may be rather general, but it is quite correct."*

I am not sure which of the definitions I like best. While they are all accurate, and perhaps in the end, all the same, the way each is expressed evokes different thoughts and responses in me. And the reality is that stress itself manifests differently in each of us.

For some people, stress makes them irritable, tense, and full of worry. For others, it manifests as low energy, fatigue, "burnout," or disinterest or lack of motivation. And then there are those who don't even know that they are stressed, because they go-go-go until they finally become overwhelmed. Until that moment, they never realize that being unable to slow down and just "BE", being a workaholic or an adreneline junkie is a way of avoiding an inner calm that would be stressful for them in a very different way.

What is Stress?

The actual term for stress came from endocrinologist Hans Selye. He found that all animals undergo a similar series of reactions to stimuli. It begins with alarm, during which adrenaline will flow to try to generate what has come to be termed as the “fight or flight response.”

Resistance comes next, as the body tries to find a way to cope with the stressor. At first the body adapts, but then over time, resources are depleted. The final stage is exhaustion, wherein the body is no longer able to maintain normal function. If the final stage is extended, long-term damage can be done to systems and glands, particularly the adrenal gland and the immune system.

Extended periods of stress wreak havoc on our bodies. But so does the repetition of moving through these phases over and over again.

Our ancestors knew no real stress other than the occasional wild animal chase, whether they were the hunter or hunted. We seem to experience it on a daily or weekly basis. The challenges of the daily commute, work deadlines and family responsibilities did not exist in the way they do now. The human body is experiencing something very new in our lifetimes, and we may not have the physiology to support it.

Stress and Wellness

Stress results in inflammation in the body. Inflammation is only just beginning to get the medical recognition it deserves, but many experts already believe that inflammation is the underlying cause of many chronic illnesses.

While many people can be confronted with stress and remain healthy, extensive research shows that stress contributes to disease. Stress has been shown to contribute to cancer, suppression of the immune system, heart disease, flu and viruses, colds, allergies, rheumatoid arthritis, ulcers and colitis, asthma, tension and migraine headaches, temporomandibular joint dysfunction (TMJD), irritable bowel syndrome, metabolic syndrome, type II diabetes, depression, high blood pressure, obesity and myriad other medical issues.

While we may be able to remove some, we cannot eliminate all of the stressors in our lives. But what we can do is change the way we react to them and how we deal with their effect on our bodies.

Breathing

It is generally recognized that we do not breathe as we should. We take short shallow gulps from our lungs instead of long deep inhales and exhales emanating from our diaphragms. While some modern Western physicians, among them Dr. Andrew Weill, have written extensively about breathing, many ancient cultures recognized proper breathing as an essential component of a healthy life.

These cultures not only believed in the importance of proper breathing, they have structured rituals and physical exercise programs around the power of the breath. Yoga and tai chi are two effective ways to integrate physical movement with breath, and as a result, to combat stress. Integrating physical exercise with breathing is especially helpful for stress release, since it combines two powerful stress release tools–breathing and exercise–into one activity.

However, simply taking a few moments to take a deep breath, or two or three, can be a quick de-stressor. I was taught a method years ago as a means of bringing heart rates down rapidly after exercise. But I found it has the same beneficial effect when a driver cuts you off or your boss says he needs that report today.

Close your mouth and breathe in through your nose slowly for a full count of four seconds. Hold the air for another full count of four seconds. Then slowly release the air out through your mouth for a full count of eight seconds, trying to ensure that you have enough air to get all the way to eight. It may take some practice! Doing that three times in a row will bring a rapidly racing heart down 10-15 beats per minute, so it's an immediate coping strategy for a stressful situation.

Meditation

I probably will write an entire book on the health benefits of meditation, but for now, I'll give a basic overview. Meditation has been shown to improve a very long

list of conditions and concerns and bring more peace and joy into your life. But despite the volumes of evidence on its behalf, many people tell me they struggle with it.

I think that's because they have ideas about what it means or how it should be done that might get in the way. Some tell me they can't quiet their mind or they fall asleep and that makes them even more stressed because they feel like they are doing it wrong!

But there is no wrong when it comes to meditation.

Meditation is about taking time to just be. Time to focus on your breathing and to quiet your mind.

Have you ever noticed how sometimes when you have a quiet moment, whether it's in the shower or in the car, that an idea comes through or you suddenly remember something you'd forgotten? That quiet space in between is where we release stress and heal, where we find ourselves again, where we touch base with our inner dreams and yearnings, and get great ideas about everything from what to make for dinner to how to solve a problem that has been perplexing us.

And we usually emerge from that moment inspired, peaceful and happy. How do you meditate?

How to Meditate

There are so many different practices and there are different forms of meditation depending on what you want to achieve. But when I teach people to meditate, I tell them to forget about all of that and not to worry about what they think or heard it should be.

Start by sitting or lying down and getting really comfortable. If it's possible, wear loose clothing and take off your shoes. Close your eyes and just focus on your breath going in and out. Hear it, feel your abdomen rise and fall as the air moves through. Try to block out everything else around you except your breath.

If being this still just isn't working for you, try adding some music to help calm and

focus you. I'll be writing more about this type of music therapy at the end of this chapter.

If thoughts come into your head, that's fine. Allow them in; they want to be heard. But don't follow them or attach to them. I like to use the analogy of each thought being a red balloon. As thoughts come into your head, assign them a red balloon and then set that balloon free. Thank the balloon if you want to. But let it go and watch it float away.

At first the thoughts may be very mundane, such as I have to pick up milk. Over time, the thoughts will be deeper and more insightful, such as I have to forgive my mother. Or I want to take up painting to express myself.

It doesn't matter what the thoughts are or how many there are: Just accept what comes, assign it a red balloon, and set it free. The goal over time will be – with practice – to see if you can expand the space in between the thoughts. To slow down the rate at which those thoughts come popping in and leave more stillness in between them.

While many people extol the praises of meditation for an hour or more in the morning and an hour or more at night, that is not realistic for – and would be challenging for – most of us. If you can do that, great! Otherwise, start with what's manageable. Can you take a minute for yourself? Are you worth that? Remember the oxygen mask!

Could you take 10 minutes before the kids get up or after the alarm goes off before you get in the shower? Could you find time during lunch or in between meetings? While you wait to pick up your kids at soccer practice? Instead of listening to the radio or doing work, take a few quiet moments for yourself and close your eyes and breathe. Even one minute will make a difference, and with practice, as with everything, you get better.

If possible, try to find even just a few moments before you start your day and somewhere near the end. If you finish your quiet time with a moment of gratitude, finding a way to give thanks for the good things in your life – even if you have to really stretch to find them in that moment – your life will become more peaceful and more joyful over time.

Music Therapy

For some people, no matter how much they practice or how hard they try, they are so in their heads that they just cannot seem to escape. Forcefully trying ends up causing them more stress instead of alleviating it. If you struggle with meditation for that or any other reason, or if you want to try something different every once in awhile, music can be a great way to relax and de-stress. While singing and dancing can be a fun way to let go, in this case, I am talking about a form of meditation to music.

Some people find classical music very relaxing, for others, its new age or jazz or their favorite soul or folk singer. The key is to find music that does not draw you in and engage your mind, but rather, lets you recede and experience the music without that mental or physical stimulation.

Usually when I usually listen to music, words engage me. So when I meditate to music, I need to have music without words so as not to focus on the music but rather to just relax with the music as a backdrop. I have been surprised that some of my favorite meditation music is not music I would typically listen to; certain music just takes me to another place when I meditate to it.

While a symphony works for some, for many, the simplicity of a soloist is more effective. Other options include Steven Halpern's new age music, Yanni, Deuter, sounds of nature like waves or rain set to music, or perhaps Native American Indian or Tibetan flutes, which surprisingly seem to resonate with many. You may need to experiment to find what relaxes you but keeps you present, versus what puts you to sleep or sends your thoughts racing.

Just as with meditation, relax and sit or lie down and just listen. If thoughts come through, honor them, assign them a balloon, and set them free. Most of the time, we listen to music while we are doing something else. You will experience the music very differently in the stillness.

And if you do fall asleep, that's ok. It means you needed it and you were relaxed enough to get there and that is also an important part of releasing stress: getting

rest and listening to your body.

Other Options

There are many other stress management therapies, including humor and art therapy, behavior modification, progressive muscular relaxation, exercise, nutrition, visualization, resource management, communication skills, creative problem solving, massage, and journaling. If they resonate with you, definitely do some research or take a class and explore them.

I personally love free-form journaling where you carry a notebook or keep one by your bed. When you are stressed, or at the end of your day, you just write, without stopping, whatever comes into your head. Don't analyze it: just let it all flow. It is amazingly cathartic! If you want to take it further, once a week, go back and re-read what you wrote. Use a red pen and circle repetitive themes or words or comments that surprise you or resonate with you. If you go back and do that several weeks in a row, you will begin to see patterns in your red-circled words that can help you determine areas of your life you want to change, people who stress you or who you need to forgive, or judgments you make about yourself that you need to heal and release.

At a minimum, I encourage you to try breathing and meditation. It takes practice, so don't be discouraged if it doesn't come easily at first. If one technique doesn't work for you after several tries, try another one. Your physical body deserves a few moments of peaceful rest and your soul is craving a quiet moment to reconnect with you. They will both thank you.

How Sleep Deprivation Affects Health

Sleep is one of my favorite things. Yes, I have a lot of energy and I am excited about living life fully. But at the end of the day, I love crawling into my comfortable bed, wrapping my favorite blanket around me and drifting off to sleep. I know that when I wake, I'll be healthier, happier and ready to create a better day as a result.

But we are a sleep-deprived nation. A recent study revealed that 70 million Americans do not get adequate sleep. Experts say we need seven to nine hours a night consistently, but many of us get about five to seven. Furthermore, while our bodies were made to recover from one interrupted night's sleep, studies now show that less than optimal sleep for a few nights in a row can change your sleep pattern, weaken your immune system and lead to an increased likelihood of weight gain, Type 2 diabetes, heart conditions, loss of long-term memory and more. Even one off night can increase your blood sugar levels and impair your sensitivity to insulin.

Sleep is directly linked to many mental processing functions including maintaining a positive mood (and managing irritability, anxiety, anger and depression), brain activity, learning, memory, concentration and our ability to handle stress. Many experts now say sleep is as important to your health and wellness long-term as a healthy diet and exercise.

Let's look at what happens in a typical night of sleep.

Sleep Cycles and REM

Our bodies know whether we are awake or asleep through nerve signaling chemicals called neurotransmitters, which act on nerve cells, or neurons, in the brain. Some neurotransmitters, such as serotonin and norepinephrine, are produced in the brainstem, where the brain and the spinal cord connect. These

keep parts of the brain active while we are awake. Other neurons located in the base of the brain appear to turn off the signals that keep us awake. A chemical known as adenosine is now shown to build up in our bodies and cause drowsiness; it then breaks down while we sleep. Healthy functioning of these neurons is required for normal sleep cycles.

There are five phases of sleep: They are known as sleep cycles 1,2,3,4 and REM (or rapid eye movement.) We pass through all five, building up from 1 to REM and then begin the cycle all over again. We spend about 50% of our total sleep time in stage 2, about 20% in REM and the remaining 30% spread out across the other sleep cycles. (Infants spend 50% of their sleep in REM.)

Stage 1 sleep is very light sleep, where we drift in and out, our eyes move slowly, our muscle activity slows down and we can be awakened easily. We may make sudden muscle contractions in this stage or remember visual image fragments. In Stage 2, eye movement stops and brain waves become slower. Stage 3 brings in very slow waves, known as delta waves, as well as some smaller faster waves. In stage 4, we are almost exclusively in a delta wave phase.

Stages 3 and 4 are considered to be deep sleep and it's hard to awaken someone from those stages; those awakened don't adjust immediately. It takes a few minutes for them to stop feeling groggy and disoriented. In this phase, kids may experience night terrors or bedwetting and adults and kids both may sleepwalk.

After stages 3 and 4 deep sleep, we enter REM during which, true to its name, our eyes move rapidly in many directions. Our muscles become temporarily paralyzed and our breathing becomes irregular and more rapid and shallow. During REM, we dream.

Each sleep cycle takes 90-110 minutes on average, with our first REM cycle typically occurring 70-90 minutes after we fall asleep. During the first cycle, the REM period is relatively short, with longer periods of deep sleep. But as we progress through the night, REM cycles get longer and deep sleep cycles become shorter. By the time we awaken in the morning, most of our time is spent in sleep stages 1, 2 and REM.

Caffeine, diet pills and other stimulants can cause insomnia, or an inability to fall asleep. Alcohol can help you fall asleep, but keeps you in lighter stages of sleep and limits deep sleep and REM. Antidepressants can suppress REM sleep cycles. Heavy smokers often stay in lighter sleep stages and have less REM sleep. They may also wake after three to four hours due to nicotine withdrawal. Temperature changes disrupt REM as well.

Research shows that if we miss one normal REM heavy sleep cycle, the next time we sleep, we will go quickly into REM and stay there longer, to make up for lost sleep. But after a couple nights of disrupted sleep in a row, our bodies will no longer compensate and drop into REM. They will simply adapt to the new sleep cycle, shifting the sleep balance away from the healing and restorative deep and REM sleep cycles.

Spending less time in the healing deep sleep cycles affects your immune system, as your body cannot repair, restore and rebalance as it is meant to with less time in deep and REM sleep. Research also shows a number of interesting connections between health and insufficient sleep, including metabolic function and cardiovascular disease.

Sleep and the Connection to Health

In one study, after only three nights of deep and REM sleep suppression, participants became less sensitive to insulin; they required more insulin to dispose of similar amounts of glucose, but the body did not compensate by increasing insulin levels. They had reduced glucose tolerance and an increased likelihood of developing Type 2 diabetes. The study equated the decrease in insulin sensitivity to gaining 20 to 30 pounds.

Recently, a groundbreaking study showed that the body's metabolic functions could be disrupted by only one night of inadequate sleep. In this study, participants were examined after a normal eight-hour night of sleep and also after a night of only four hours of sleep. The study revealed that "Insulin sensitivity is not fixed in healthy subjects, but depends on the duration of sleep in the preceding night," according to Dr. Esther Donga, of the Leiden University Medical Center in the Netherlands and lead author of the study.

Another study monitored participants after two nights of regular sleep and then five nights of sleep restriction. After five nights of only getting four hours of sleep, the results indicated a statistically significant decrease in the heart rate variability, which can result in cardiological and non-cardiological diseases, according to Siobhan Banks of the University of Pennsylvania School of Medicine.

A recent study of insomniacs showed that sleep deprivation also increased the risk of hypertension. Those who slept for less than five hours had a 500% higher risk for hypertension than those who slept for six hours or more. Insomniacs with sleep cycles of five to six hours a night had a 350% higher risk of hypertension than normal sleepers.

Another study revealed that four nights of REM sleep deprivation reduced cell proliferation in the part of the forebrain that is responsible for long-term memory.

And a 16-year study revealed that women who slept for five hours a night were 32% more likely to gain weight (defined as an increase of 33 pounds or more) and 15% more likely to become obese versus women who slept for seven hours. Six-hour-a-night sleepers fared a little better, with a 12% increase in major weight gain and 6% obesity increase over the seven-hour sleepers.

As I said at the beginning, I enjoy sleeping very much. I know that when I wake from a restful night's sleep, I'll be healthier, happier and ready to create a better day. So even though our busy lives tempt us to put off sleep in favor of getting more things done, if you want to live a longer, healthier life, make a good night's sleep a priority—you'll have more energy—and feel better—tackling your tasks the next day.

20 Tips to Ensure You Get Enough Sleep

We all need a good night's sleep, but it's not uncommon to struggle with getting one. It's estimated that one in three people will suffer from insomnia at some point in their lives. Most of us will experience short-term insomnia, which is

caused by stress or a short-term disruption in sleep patterns, like travel, a sick child, noisy neighbors or excitement about an upcoming event. Long-term insomnia, which is defined as continuously broken sleep patterns lasting more than four weeks, can be a sign of clinical depression or another serious medical condition that you should discuss with your doctor.

Insomnia can manifest either through an inability to fall asleep or the inability to stay sleep through the night. Either way, normal healthy sleep patterns are altered and this has a measurable effect on health. It's important to correct any short-term sleep disruptions as soon as possible to prevent permanent sleep pattern alterations or long-term deterioration of health.

In this section, I'll look at what you can do to ensure you get the sleep your body needs to heal, repair, restore and grow.

Environment and Routine

Get in a routine. Just as bedtime routines are important for children, research shows that establishing a consistent bedtime routine can also help adults transition to sleep more smoothly. Going to bed at the same time every night and doing something relaxing before bed to help you release stress can help your body prepare for sleep.

Create a comfy space. Keep your bed and your bedroom for activities that belong there: sex and sleeping. Don't watch TV or eat snacks in bed. Create a comfortable, soothing bedroom escape with cozy blankets, soft sheets and a comfortable mattress. If your mattress is lacking, consider a memory foam mattress topper. It's an inexpensive way to make a less than top-notch mattress incredibly comfortable and inviting.

No TV or work. Don't watch TV, especially violent TV crime shows or the news, before you go to sleep (in bed or anywhere else). Doing this will put your mind into an agitated state and disrupt the pineal gland, which will make it harder to fall asleep. Also put away any work at least an hour or two before bed so your mind is not still thinking about work-related challenges or trying to solve problems as you head into bed.

Listen and read. Listening to relaxing music such as nature sounds, new age or soft classical music can help, as can reading something spiritual or an uncomplicated book. (My mom is an avid reader and often tackles challenging reads, but keeps a few light romance novels by her bed and reads a chapter or two of those before sleeping because they don't stimulate her as she is trying to wind down.)

Release stress. Journal, meditate or do deep breathing before bed; if you are holding onto any tense or anxious thoughts, sleep will be difficult. Some people also find progressive muscle relaxation therapy to be helpful. (This involves lying down and tensing each muscle group for eight seconds as you inhale and then slowly relaxing the same muscle group for eight seconds as you exhale slowly and release all tightness and tension. You can hit every muscle head to toe, or pick four major areas of face, neck/shoulder/arms, abdomen and chest, and finally buttocks, legs and feet.) Some readers have told me that they struggle with meditation because they fall asleep, but this is the perfect opportunity to use your meditation techniques to help bring about sleep.

Take a bath. Build a warm bath with Epsom salts, sea salts and/or baking soda into your routine. If you dislike baths, take a hot shower or a sauna instead. When you are wound up or stressed, get a professional massage or ask your partner to give you one to relax. Use essential oils (many have medicinal purposes and some even target insomnia) or other fragrances that calm you.

Cool down and warm up. Pay attention to room temperatures and keep yours below 70 degrees. In cooler months, consider wearing socks to bed. Feet have the poorest circulation and will feel the cold first. One study showed wearing socks to bed can reduce waking at night.

Block out light. Sleep in complete darkness and/or wear an eye mask. Sleeping in as close to total darkness as possible is important because darkness increases the production of melatonin. Melatonin is a hormone produced by the pineal gland that regulates the body's sleep cycle. It's believed to help people fall asleep more quickly and to sleep more soundly. Studies show that if you are exposed to light while sleeping, your melatonin level will not rise high enough to do its necessary work. Even a night-light can cause disruption. New research ties

sleep disruption due to even small amounts of light resulting in increased cancer rates as well.

No more liquids. If you wake up to go to the bathroom in the middle of the night and you struggle to return to sleep afterward, be sure to empty your bladder before bedtime and avoid liquids for 90 minutes before bedtime to reduce the likelihood of waking to urinate.

Don't just lie there. And lastly, if you're tried these techniques and you still struggle with falling asleep, don't stare at the clock and stress about what time it is! Get up and out of bed and do something to relax you: read, listen to music, clean something, tackle a project and go back to bed when you feel more relaxed, tired and ready try again.

Diet, Supplements and Exercise

Try magnesium. When I experienced sleep disruptions from hormonal imbalances many years ago, I read about magnesium as a potential solution. Magnesium and calcium need to be eaten/taken together in balance and many of us are calcium heavy and magnesium deficient, which can disrupt sleep.

I bought magnesium and found it let me sleep continuously through the night. I have since recommended it to many people who have reported great success. At the time, I bought whatever I could find at the store. Now more research has been done and one doctor has achieved amazing results using a specific form of magnesium known as magnesium chloride.

Dr. W. Davis, an author and cardiologist practicing in Milwaukee, Wisconsin, reported that "sleep was induced rapidly, was uninterrupted, and that waking tiredness disappeared in 99% of the patients. In addition, anxiety and tension diminished during the day" after supplementation with magnesium chloride.

Identify food sensitivities. As we noted in the chapter on food additives, food additives, chemicals, artificial dyes and flavorings can affect sleep patterns. Many people have food sensitivities or allergies they are unaware of. Poor digestion, impaired liver detoxification and food sensitivities can keep you from a good night's rest by causing gas, gastrointestinal distress, excess congestion, apnea,

and other symptoms.

Eliminate food sensitivities. The most common food sensitivities that affect sleep are corn, wheat, dairy, caffeinated products and sugar. If you have never tried an elimination diet, you might consider one. These diets involve removing a questionable food from your diet for a week or two and then introducing it back in and seeing how your body reacts. Another option is to have a food allergy test. While you may not be allergic to a food, many of us are sensitive to it and never know it. If you are sensitive to corn or gluten or dairy, for example, eliminating or reducing these foods will help you sleep better; if you can't eliminate them, try taking a digestive enzyme before meals.

Eat sleep-inducing foods. Eating a balanced diet with healthy fats, protein and fiber will help keep your digestive system balanced. Chlorophyll-rich foods like leafy greens and microalgaes like chollera and spirulina are not only healthy, they are sleep inducing. Sugars, spices and stimulants will have the opposite effect.

Don't eat before bed. Avoid eating immediately before bed, especially grains or sugars, as they raise blood sugar, and later when it crashes, you may wake up and find it difficult to return to sleep. Because digestion takes a lot of effort, avoid eating any big heavy meals later in the evening as well. Leave at least a couple hours between your last meal and bedtime.

Avoid caffeine after noontime. Caffeine isn't metabolized well and even an afternoon cup of coffee, tea or some chocolate can disrupt nighttime sleep patterns if you are sensitive. Alcohol can also disrupt sleep patterns as we mentioned in the previous chapter; while it helps you relax and fall asleep, it often results in nocturnal awakenings that disrupt deep sleep cycles where healing occurs.

Avoid prescription medications where possible. Many have side effects that can disrupt sleep. Rather than treating the symptom, work with your doctor on changing the diet and lifestyle habits that can help get at the underlying cause.

Get an adrenal function test. The Journal of Clinical Endocrinology and Metabolism published a study connecting insomnia to adrenal stress. Your doctor

should test your adrenal function if sleep is an unresolved concern. Similarly, hormonal balance can disrupt sleep patterns, so women in perimenopause or around menopause should get a hormone panel done to rule out imbalances as causes of sleep disruptors.

Try melatonin. I mentioned melatonin earlier as controlling sleep schedules. Melatonin, or its precursors L-trytophan or 5-htp, may be helpful as a supplement if other underlying causes are ruled out. (Tryptophan has to be combined with carbohydrates in order to reach the brain but can be consumed through things like turkey or received as a prescription from your doctor. 5-htp seems to be more effective in those who have underlying depression as well as a sleep concern.)

Get some exercise. Exercise has been shown to be one of the most effective means of combating insomnia, so if you struggle to sleep at night, be sure you get out and get active for at least 30 minutes during the day. A Stanford University study showed that after 16 weeks of moderate exercise, participants fell asleep 15 minutes earlier and slept 45 minutes longer than they had before.

I hope there are some easy changes on this list that you can make to help bring about sleep with greater ease. If you suffer from bigger sleep troubles, work with your doctor to discover the cause and the best relief. Whatever you do, don’t ignore your sleep troubles, as sleep deprivation over time will prevent your body from performing its necessary healing functions and will subtract years and quality from your life.

How to Achieve and Maintain a Healthy Prostate (or Breast)

In this chapter, I'm going to cover a topic of concern for most men: prostate health. But this topic is important for female readers too. This information will likely be helpful to someone you love who does have a prostate AND you'll also find much of this information applies to breast or uterine health. Many scientists consider prostate cancer in men to be the equivalent of breast cancer in women because it is brought about by the same conditions, factors and imbalances that simply manifest in different sexual organs because of gender. So ladies, there is something here for you, too.

What is the Prostate and How Does it Work?

The prostate is a small gland about the size of a walnut just below the bladder and in front of the rectum. The prostate wraps around the urethra, a tube that takes urine from the bladder out through the penis. The prostate makes the milky fluid that carries the sperm, which is made in the testicles, out through the penis during ejaculation.

As men get older, enlargement of the prostate is a common concern, affecting more than half of men by age 60 and an estimated 80% by age 80. As the prostate enlarges, it presses against the bladder, resulting in a disruption of the flow of urine, causing frequent urination, difficulty urinating, a weak urine stream or a feeling that the bladder has not fully emptied.

Looking at those statistics, it may seem that prostate challenges are inevitable. But research shows there is much we can do to prevent these problems. However, the conditions we create in our bodies do not appear magically overnight; they are the result of the many small choices we make each day. There are no quick fixes for good health, but the recommendations below can have a positive effect over time.

Achieving and Maintaining a Healthy Prostate

Here are some of the things you can do to enhance prostate health (and if you are a woman, think breast health instead):

Eat a healthy balanced whole-food diet: Ensure you are consuming all the vitamins, minerals, trace minerals and phytonutrients your body needs. Take a whole-food supplement to cover any gaps. Eat more fiber, especially from vegetables, as vegetable fiber is shown to help with blood sugar and reduce the risk of prostate problems. Reduce or eliminate white sugars and flours from your diet and choose foods lower on the glycemic index that are rich in fiber and healthy fats.

Hormonal balance is important and I'm going to talk about balancing our sex hormones shortly. But you cannot balance your secondary (sex) hormones (i.e., testosterone and estrogen, which are very important to prostate health) when your primary hormones, like insulin, are out of balance. **Balance your primary hormones** by making sure that your blood sugar is regulated so that insulin is not a concern.

Reduce internal inflammation: It's directly connected to prostate problems and tied to many cancers including prostate and breast. Johns Hopkins research shows that early stages of prostate cancer go hand in hand with chronic inflammation and that an anti-inflammatory diet can help correct this. Pay attention to high cholesterol not because cholesterol is bad; cholesterol is part of your body's natural healing process. Rather, high cholesterol is an indication that inflammation is occurring in the body. Ubiquinol can help prevent the low-density lipoprotein (LDL) oxidation that causes inflammation in the arteries. Omega 3 can help reduce inflammation already present.

Cholesterol levels are important for another reason: **Higher cholesterol typically indicates higher levels of estrogen in the body**. (Estrogen levels are also usually higher in obese men.) Higher estrogen levels are shown to double the risk of stroke, significantly increase the risk of heart disease and increase thickening of the arteries. High estrogen levels are tied to prostate cancer as well, though some scientists think it hasn't been studied enough because many

men with high estrogen levels succumb to other diseases long before prostate concerns manifest.

Hormones are always about balance and our sex hormones are no different. When estrogen levels increase, it means that relatively speaking, there is less testosterone. (Or in women, less progesterone.) Testosterone is required to maintain a healthy prostate and men with higher levels of testosterone are better able to prevent prostate problems. Because it's about balance, we either need to **raise testosterone levels or eliminate the excess estrogen**. Increasing testosterone can only be done effectively through a prescription medication that comes with a host of side effects.

But there are a number of ways to **avoid excess estrogen**, including reducing your meat and dairy intake. Humans are the only species on the planet whose adults drink milk (or consume large amounts through cheese, ice cream and other dairy products). Milk from perennially pregnant cows is, not surprisingly, laden with hormones such as estrogen.

In addition, **we are daily bombarded with estrogenic compounds called xenoestrogens**. These compounds can mimic estrogen and take up estrogen receptor sites, leaving the body's estrogen to wander looking for an available receptor site. This excess estrogen imbalances our normal hormone ratios. Xenoestrogens are found in petroleum-based products, plastics, herbicides, pesticides and fungicides. They are in car emissions, paint, nail polish, soap, lotion, food, water and the air. Xenoestrogens result in an increase in belly fat or breast development in men as well as weight gain, allergies, sinus infections, fatigue, mood swings and the onset of andropause, the male equivalent of menopause. Andropause can result in impotence, low sex drive, low sperm count, low absorption of zinc, increased risk of heart disease, and not surprisingly, urination and prostate problems.

While we can reduce meat and dairy and improve our diets, we cannot control all the elements in our environment. This is where **the supplement DIM (or diindolylmethane)** that I speak about in the final chapter on supplements everyone should take can help. DIM is a phytonutrient that occurs naturally in cruciferous vegetables such as broccoli, cabbage and Brussels sprouts. It was

discovered about 10 years ago, but its benefits are only just now being understood.

Taking DIM has the equivalent effect of eating three pounds of broccoli a day. DIM is a natural estrogen balancer in women and men. It can **promote healthy estrogen metabolism and prevent estrogen dominance**, and is also shown to protect against cancer, heart disease and to support healthy prostate tissue and prevent prostate enlargement.

The plant indoles in cruciferous vegetables have been shown to **regulate hormone metabolism** and not only manage estrogen in men, they have also been shown to **support a more desirable testosterone function**. DIM can help estrogen break down into its "good" metabolites, which are responsible for the positive things we hear about estrogen: protection of heart and brain activity.

Slow estrogen metabolism can result in too much active estrogen, or estradiol, in the body, which causes problems like weight gain, diminished sex drive, male pattern baldness and prostate enlargement. **DIM increases the "good" estrogen metabolites**, which serve as antioxidants in the body and simultaneously decreases the "bad" metabolites, which are not antioxidants and can cause cancer in the body.

I don't normally recommend specific supplements, but many of us (male and female) are estrogen dominant as a result of our diets and our environment and thus have hormonal imbalance issues. For anyone concerned about estrogen metabolism or hormonal imbalance, or dealing with the physical manifestations of such, **I recommend the BioResponse form of DIM**, as it is a naturally occurring phytonutrient that is microencapsulated to ensure absorption.

Other Ways to Support Prostate Health

Maintain a healthy weight. Obesity is tied to many health issues including heart attacks, diabetes and prostate problems. Excess weight around the mid-section is a particular concern, as it's far more detrimental to our health than weight gain anywhere else in the body. Gaining weight or enlargement of the breasts is also a concern as it reflects excess estrogen.

Exercise for physical health and to reduce stress. Research shows that as little as 15 minutes of exercise a day reduced the mortality rate of men with prostate cancer. As exercise intensity levels and frequency increased, so did survival rates. Men who exercised three or more hours a week (moderate to intense exercise like jogging, cycling, tennis or swimming) reduced mortality rates by 35%. Men who walked four or more hours a week reduced mortality by 23% while men who walked 90 or more minutes at a brisk pace had a 51% less risk of death than those who walked less than 90 minutes at a slower easier pace. Those who engaged in vigorous physical activity for five or more hours a week showed a significant reduction in mortality.

Engage in frequent sexual activity or masturbation. Studies show that carcinogens pool in seminal fluid and that releasing the toxins from your prostate regularly improves prostate health. It's the ejaculation process that is beneficial. Improvements are shown at two times a week, with additional protection afforded at three or more times a week. (And Dr. Oz just said the average American has sex once a week, but that increasing it to twice a week can add three years to your life.)

Release any buried anger and resentment. Holding onto it doesn't serve you in any way and keeping negative emotions inside the body has a physical effect on our cells. Anger and resentment have long been correlated to cancerous cell growth in energy medicine and this idea is now being proven in research as well. Negative feelings increase the stress level cortisol, a hormone that has been consistently found to repress the function of the immune system. When the immune system is not at the top of its game, the cancer cells that are present in every body have a better environment in which to multiply and can form tumor sites.

Suppression of anger, hate, grief or resentment can also the damage the emotional reflex center in the brain. Over time, this will result in a breakdown that will result in wrong messages being sent to the organ it controls, creating deformed or cancerous cell growth. Numerous studies of cancer patients have identified an unresolved conflict, or suppressed and unexpressed emotion, usually occurring several years before cancer emerged.

And when adrenaline is low, the environment is better for cancerous cell growth. High stress levels will deplete your adrenaline reserves enabling a cancerous environment. **Let your feelings out and release stress** in other ways such as meditation, deep breathing, journaling, music, and laughter. Laughter is a powerful stress reliever, so when you've had a bad day, find some friends you can laugh about it with, or watch a favorite funny movie and laugh out loud.

Research shows that **vitamin D helps prevent a variety of cancers**, including prostate and breast. In one study, supplementation was shown to reduce the PSA (prostate specific antigen) levels in men with prostate cancer. Another study revealed that men with high vitamin D levels were half as likely to develop aggressive forms of prostate cancer as men with lower levels, so get outside and get your daily dose of sunshine.

As for specific supplements or foods to enhance prostate health, there are many. There are a number of food studies that indicate the benefits of certain foods such as garlic, scallions, pomegranate, walnuts (for the omega 3s and gamma tocopherol, a form of vitamin E), coffee (for the antioxidants), cooked tomatoes (for the lycopene), bee pollen (for the zinc) and it never hurts to **add more healthy foods** to our diets.

There are also nutrient studies touting saw palmetto, zinc, boron, K2 and selenium but there are also risks of taking too much of these in supplement form. Generally speaking, taking any supplement in isolation limits its effectiveness. When you **eat the foods themselves**, or the food sources of the minerals and phytonutrients, it's hard to overdose and they can offer great prostate health benefits.

By eating a balanced whole food diet and taking a whole-food supplement, you will be getting all the vitamins, minerals, trace minerals and phytonutrients you need together to absorb and fully utilize the benefits. That makes good sense for overall wellness as well as prostate health.

Prostate Screening

In March 2009, the New York Times ran a story with the headline, "Prostate Test Found to Save Few Lives." The article reported on two large studies, one in the

US and one in Europe, indicating that the prostate-specific antigen (PSA) blood test that screens for prostate cancer was shown to save few lives -- and that it led to risky and unnecessary treatments for large numbers of men.

The Chief Medical Officer of the American Cancer Society, Dr. Otis Brawley, called the studies “some of the most important studies in the history of men’s health.” Experts have been debating the value of the test for years and the cancer society has long been urging men to be fully informed before they decide to have a PSA test, but they never had the data to back it up. “Now,” as Dr. Brawley states, “ we actually have something to inform them with,” Dr. Brawley said. “We’ve got numbers.”

The New England Journal of Medicine published both study reports the same day. The European study covered 182,000 men in seven European countries and the US study -- conducted by the National Cancer Institute -- included nearly 77,000 men at 10 different medical centers across the U.S.

In both studies, participants were randomly selected to either be screened by the PSA test or not and then they were followed for a decade afterward. Prostate cancer deaths were tracked among each group in order to determine if the screening made any difference to prostate cancer mortalities.

In the American study, all the men were followed for at least seven years, while most of the men were tracked for ten years. After seven years, the group that had not been screened had a prostate cancer death rate 13% lower than the screened group.

The European study was more complex and included several studies with different designs. But taken together, they found that there was a 20% reduction in deaths in the screened group, but that the number of lives saved over the nine year follow up was very small: 7 lives for every 10,000 men screened. There was no benefit found in the first seven years after screening.

When the test was undertaken, some urologists said it was unethical not to screen men and demanded it be shut down. Many scientists expected to see some difference in mortality rates as soon as five years into the study. But that did not occur. Some experts were thrilled to see the data confirming what they’d

suspected all along.

The PSA test that is conducted indicates whether there is a possibility that cancer might be present. This then leads to biopsies in order to determine if there is a tumor. But even if there is a tumor, not all tumors lead to death: many grow very slowly and are never a threat. Those that do grow quickly, often grow so fast that early detection might even be too late.

While no benefit to screening was found in the US study, a small benefit was found in the European study. But in the European study, 48 men were told they had prostate cancer and treated needlessly for every one man that was saved within the decade after the PSA test.

Dr. Peter B. Bach of Memorial Sloan-Kettering Cancer Center put it this way, “One way to think of the data is to suppose he has a PSA test today. It leads to a biopsy that reveals he has prostate cancer, and he is treated for it. There is a one in 50 chance that, in 2019 or later, he will be spared death from a cancer that would otherwise have killed him. And there is a 49 in 50 chance that he will have been treated unnecessarily for a cancer that was never a threat to his life.”

Treatment for prostate cancer is not without impact: it can result in impotence and incontinence if the treatment option is surgery and chronic diarrhea or painful defecation when treated with radiation.

Dr Michael Barry of Massachusetts General Hospital wrote an accompanying editorial pointing out that if the European study is correct, mammography has comparable benefits to prostate screening. About 10 women receive diagnosis and treatment for breast cancer as a result of a mammography for every one death that is prevented.

The real screening benefit would come from a test that could determine which tumors are cancerous and which are not, but that test does not yet exist.

In the year since the release of the studies, the cancer society has tried to spread the word about these test results, and in March of this year it revised its screening guidelines to recommend that “beginning at age 50, men with no

special risk of prostate cancer discuss the pros and cons of screening with their doctors and decide together whether it's worth doing."

"What we are trying to say to men is the harms (of prostate screening) are better proven than the benefits," said Dr. Otis Brawley, chief medical officer of the American Cancer Society. The new guidelines are not really that different from those that have been issued previously in 1997 and 2001, but they now come with an increased focus on individual counseling.

The American Society of Clinical Oncology, representing the cancer specialists including those who treat prostate cancer patients, supports the Cancer Society Guidelines.

"All men considering testing for prostate cancer should be fully informed by their clinicians about their risk factors and other uncertainties before being screened," a statement from ASCO President Dr. Douglas Blaney said.

The American Urological Association does not fully agree. They agree that informed decision making is important, but they think men should have a baseline PSA test at age 40 and then annually after 50. They say that everyone should get the screening and rather than discussing the risks and benefits of screening prior to screening, the discussion should wait until the 10-15% of men whose screening results indicate a risk of cancer and then should be advised of the risks and benefits of treatment.

Everyone agrees an informed discussion should take place: the question they disagree on is should it happen prior to having a screening or after you get the potentially "bad news" results and assess your treatment options.

One argument made is primary care physicians don't have the time (or sometimes all the information) to sit down discuss and advise a patient in their brief physical, when they also need to guide them on issues like diet, exercise, blood pressure, diabetes, and heart health. This is a valid point, to which Dr. Brawley of the Cancer Society responded that the new guidelines state that men can "be referred to reliable and culturally appropriate sources" for their counseling on whether or not to have a PSA screening, so "the information doesn't have to come from a doctor."

Most American men are screened, resulting in a diagnosis of prostate cancer in an estimated 192,000 men last year. In Europe, most men are not screened. The decision regarding whether or not to screen is a personal one based on your own health history, diet, lifestyle and genetic predisposition and it should be discussed with your doctor. But you should be informed fully as to risks and benefits of such a screening and should be aware of the guidelines put forth by the American Cancer Society and the American Society of Clinical Oncology so that you can partner with your doctor to make an informed decision.

Breast Screening

And for the ladies, similar questions are raised regarding breast screening and mammograms. Mammograms use radiation to detect lumps in the breast and are touted as an early screening mechanism. However, many experts have stated that it can take as long as 7-8 years before a cancerous lump is large enough to be detected by a mammogram.

The job of a mammograms is not to detect cancer: its job is to find lumps. They are not completely reliable, however, as the National Cancer Institute reports that they miss up to 20% of cancers present at screening. They can also yield false positive results. A Swedish study revealed that 70% of the lumps detected by mammograms were not tumors at all. (Which means that that 70% of women endured unnecessary procedures for false positive results.) Now the flip side to that is that 30% were tumors and that mammograms may potentially have saved those women.

But in doing so, the mammogram may also have caused the cancer. The mammogram itself exposes delicate breast tissue to radiation and repeated radiation exposure is linked to cancer. The mammogram breast compression process can also rupture blood vessels, resulting in existing cancer spreading to other areas. In addition, some women also have a gene called oncogene AC, which is extremely sensitive to radiation. One statistic I saw stated that 10,000 women will die from breast cancer this year due to mammography activating this radiation sensitive gene.

According to the National Cancer Institute, “Screening mammography is also

associated with potential harms, including false-negative results, false-positive results, the diagnosis and treatment of cancers and ductal carcinoma in situ lesions that would not have caused symptoms or threatened a woman's life (i.e., overdiagnosis, overtreatment) and radiation exposure."

So if the risks of mammography concern you, as they do me, what can you do? One alternative is thermography or thermal imaging, which can detect abnormalities years earlier. Pre-cancerous growths need nutrients to grow and the resulting chemical and blood vessel activity raises surface temperatures in the breast. Thermography can detect these changes without radiation or compression, often years before a mammogram would discover a lump.

If you are unsure about whether your potential cancer risk outweighs radiation risks, you might also consider gene testing. In addition the radiation gene already mentioned, there are two gene mutations linked to breast cancer: BRCA1 and BRCA2. According to the Susan G. Komen Breast Cancer Foundation, "A woman's odds of developing breast cancer in her lifetime (assuming she lives until the age of 85) are a bit over 13 percent if she does not have a BRCA1 or BRCA2 mutation, 60 percent to 80 percent if she has a BRCA1 mutation, and 30 percent to 85 percent if she has a BRCA2 mutation."

In addition to knowing your family history and your own personal awareness of the presence of excess estrogen levels in your body, clearly, knowing your gene mutation risk would be helpful in guiding your choices. The Canadian Cancer Society has concluded there is no benefit to screening women under the age of 50 by mammogram. In the US, however, health care – especially cancer diagnosis and treatment -- is a big business. Screening recommendations carry enormous financial impacts and aren't necessarily based on what's best for YOU. It is up to you to partner proactively with your doctor to determine what your risk profile and tolerance is and determine your best options for breast health.

7 Tips for Creating an Effective Exercise Plan

Most of us know we need to start—or increase—our fitness efforts, but many of us have difficulties getting started. In addition to weight management, exercise improves your mood, increases energy, reduces stress, helps you sleep better, boosts self-esteem, supports hormonal balance and reduces risks of chronic diseases and conditions including heart attacks, osteoporosis and breast cancer.

A recent study on mature women showed that just to maintain their current weight, the women needed to exercise for an hour a day; to lose weight would require even more time. In our busy lives, finding an extra hour can be a challenge, even if we have the desire to do so and the willpower to stick with it.

The good news is that we don't need to work out for an hour in one session: We can break it into smaller blocks. And doing something is better than nothing, so even small efforts will make a difference in your health and well-being. In this chapter, I'm going to give you some tips that I use when coaching that can help make your workouts work better for you.

Tip #1: Set a Goal and Measure Your Progress

Knowing what you are working toward will increase your effectiveness. As in everything else, what is measured and monitored gets done. Begin by setting an overall goal for your fitness plan. Be clear on what you want, for example, losing 25 pounds, training for a 10K or building enough endurance to be able to be comfortably active with your grandkids. The more specific you can be, the better. If your goal is to get fitter, define what that means to you.

Set a mini goal before each workout. Your first time, it may be as simple as walking without stopping for 15 minutes. That becomes your baseline and you

can adjust from there by adding 5 minutes to your workout each time or running a mile a few seconds faster.

Be realistic with your goals, and yourself: If you didn't sleep well the night before or you are fighting a cold, your goal may be just to complete the same workout you did the time before. And that's OK. But if you are feeling good that day, decide how you can push a little.

Make a log to track your progress. When I was training to cycle from Banff to Jasper in the Canadian Rockies, my first cycling vacation, I kept a log of each training ride that included how far I rode, how long I rode, the time of day, the weather conditions and how I felt. Tracking that let me see how I was improving and how my performance was impacted by wind, time of day and my mood. This let me get smarter over time about how to train and when to push.

Tip #2: Know Yourself and Leverage Your Strengths and Passions

We all have different times of day when we feel most energetic and creative: Don't resist your natural patterns. If you are forced to adopt new body rhythm patterns, you can do so over time, but it will take a little extra effort, so it may be harder to stick with.

Follow your passions to keep exercising from feeling like a chore. Go back to things you loved as a child like bike riding or tennis, or take up a new activity you have always wanted to try like golf or rowing. If you love watching *Dancing with the Stars*, try a ballroom dance or Zumba class.

But don't feel you have to take on things that don't appeal to you just because they are effective for others. If you hate the gym, don't join a gym! If you don't like exercising alone, find a class, team or group. Create a program that you will look forward to, not dread.

Tip #3: A Little Help from Your Friends

Studies show that people who join the gym with a buddy stick with their fitness efforts longer. It may be the accountability factor or the social factor, or most likely, both. If you take a class or play on a basketball team, the fun and social

aspect will keep you committed and motivated beyond the pure physical benefits.

If you decide to workout on your own—at a gym, in your home, or outside—try to engage a partner or friend to either join you or to hold you accountable. For example, if you join a gym, get a friend to join too; while you may not work out "together," you can plan to go several times a week at the same time. If you decide to walk your neighborhood after work, find someone to join you.

If you are using an exercise machine in your house and there is no way for someone to participate along with you, get creative. Find someone else that's doing the same routine, and meet once a week to compare progress. Set some goals or challenges for each other and know that on Monday when you meet for coffee she is going to ask you if you met—or exceeded—your goal.

Tip #4: Schedule Your Workout

Life gets crazy at times and often the first thing to suffer is our workout time. Sometimes we feel selfish "indulging" in time for ourselves when there is so much else to do. Other times, people demand we prioritize other things. But taking care of yourself by working out ensures you will be around a lot longer to take care of others. And after you work out, release stress and improve your mood, you will be a better partner, parent or friend. So don't let the workout slide.

Instead, schedule your workout just as you would a meeting or a dentist appointment. Mark the time in your calendar in ink and consider it unchangeable. If you think about everything you have to do in a day, there really is very little if anything more important than taking a little time to get or stay healthy. And you'll feel so much better! Let it be known that you are unreachable during that time; you'll find the world will still be waiting for you when you are done.

Tip #5: Find Your Motivation

When you are working out and feeling like you want to stop, or you are avoiding beginning your exercise, try to remember your initial goal and motivation for starting your fitness program. The more you focus clearly on that outcome, see it in your mind and feel how good it will feel to achieve that and be living that life, the easier it will be to find the strength to continue. Also remembering how good

you feel when you're done can help get you going.

But there will be days when even that is not enough. When you are working out, it will be easier to push to new levels if you also draw on other motivation techniques. Find what works for you, whether it is just inspiring music, a bet with yourself or creating scenarios to encourage you to continue on.

As a spinning instructor, I see lots of competitive people in my classes. (Spinning, or indoor cycling, is a form of high-intensity exercise that involves using a stationary exercise bicycle in a classroom setting.) It is easy to inspire them with race situations where they are competing for the podium or to beat their best time. If that works for you, use your competitiveness to make some fun scenarios in your workout to make you work harder.

For non-competitive people, I use a lot of visualization to encourage increases in effort. As you accelerate and push for your interval, imagine a group of runners or riders ahead of you that you need to go around.

Or imagine you are in one of those charity rides/races and there are hundreds of people you need to pass because the road is full of riders. As you go around each one, ride for the cause that that race represents. Imagine yourself passing—or climbing that hill—to beat cancer or heart disease, for yourself or for the loved one you lost to them who cannot be here to ride.

It doesn't have to be serious, though; sometimes motivation can be just pure fun. An elderly woman in one of my classes once confessed to me that every time she took an interval, she imagined racing her husband—the loser had to clean the bathrooms. In all her years in my classes, in her mind, she never lost.

For endurance situations, I often think of Terry Fox, the Canadian who decided to run across his home country to raise cancer awareness after his leg was amputated. He ran the equivalent of a full marathon for 143 days in a row until he had to end his journey because the cancer returned.

When I am tired after running a few miles, I think about that: A full marathon every day for 143 days, all on one leg. That inspires me to keep going. When Terry was asked how he kept going, he once said that he told himself just one

more telephone pole. So think OK, just one more telephone pole, one more set, one more …

Tip #6: Pace Yourself and Be Realistic

We often get excited upon starting a new plan and take on too much too soon. You didn't gain that weight overnight: In most cases it was small choices each day that built up over time. An extra 500 calories a day would net 3500 extra calories a week, or a gain of about 50 pounds in a year, assuming no change in exercise.

Most of us aren't gaining 50 pounds a year, so more likely it's the extra 100-200 calories here and there that just add up slowly over time. Generally speaking, you cannot escape the calories in/calories out equation, though it is really important to note that 500 extra calories of fiber and vegetables will not have the same impact in your body as 500 extra calories of cookies and bread.

You can't lose more than a pound or two a week safely and keep it off long term. If you keep your food habits the same, to lose a pound a week, you'll need to burn 500 extra calories a day. But physically, you can't run an hour the first time out, nor can you serve and volley after your first tennis lesson.

It takes time, but that's OK. Making the commitment and sticking with it is what matters. Creating a solid fitness foundation that you can build upon will serve you over the long haul: Trying to take on too much too soon will burn you out or result in injury and leave you on the sidelines.

Tip #7: Change is Good

We tend to find something that works and stick with it. And while that's good, our bodies quickly adapt to what we do regularly. Intensity progression and cross training can yield great benefits. If you take a set of 10-pound weights (or whatever would be appropriate for your fitness level) and do three sets of 10-12 repetitions, the first time you do it, you'll probably be sore.

If you continue to lift the same 10-pound weights in the same three sets over time, after awhile, it will not be hard any more. Eventually it will be easy. What

burned the first time and built some muscle, no longer has any muscle growth because the body has adapted to it. When lifting, we know you need to progress and either increase sets or increase weight.

It is also true for your other workouts: Your body will quickly adapt to the same hour-long spin class or 18 holes of golf and it will not be a challenge anymore. Varying the intensity will allow you to continue to progress while doing the same thing, and cross training will force your muscles to work in different ways.

Throwing something new at your body through cross training has many benefits physically, including helping you get stronger, faster and fitter. But it's also good for the soul. Trying new things and being a little uncomfortable challenges us; succeeding at them helps us grow and builds confidence and self-esteem.

Getting out of a training rut and mixing it up will keep you from burning out and will make your training fresh and new. And most of all, it keeps working out fun! And if it's fun, you'll stick with it longer.

Getting FITTER: Balancing Cardio, Strength and Flexibility Training

Cardiovascular training is what most people think of when they think about exercise: running, cycling, rowing, fitness classes like aerobics or bootcamp. Cardio training will raise your heart rate and sustain it at that elevated level for some period of time. It can be a steady state more of an endurance type of elevation or it can include interval training, which incorporates high exertion effort (where you lose or come close to losing your breath) coupled with lower intensity 'recovery' time. Either way, it burns a lot of calories, improves your lung capacity, and can leave you with a post-exercise 'high'.

Strength training builds muscle; strong muscles support your bones, burn more calories when you are not active, and minimize injuries as we age. This does not mean you must lift weights, nor does it mean you'll turn into a body builder. Body resistance and functional exercise can strengthen the body in its natural movements and create lean powerful muscles.

Flexibility is very important to minimizing injury and continuing ease of movement as we age. Flexible hip flexor muscles can help reduce hip fractures that occur when our bodies fall out of alignment. Simple stretching not only elongates compact contracted muscles, it helps support good joint movement and is a source of additional energy when you are tired or a way to relax when you are stressed.

To be comprehensive, a fitness plan needs to include all three of these exercise types: cardiovascular training, strength training and flexibility training.

Cardiovascular Exercise

Activity to the point that we start breathing harder, heavily, or maybe even lose our breath may seem intimidating if you don't do it regularly, but raising your heart rate, as happens during cardiovascular exercise, is important: it enables the body to burn more fat and calories, reduces inflammation, helps the body remove waste, and it enables oxygen and nutrients to be more readily delivered to body tissues. Cardiovascular activity helps manage stress by lowering cortisol levels, which can make you feel better and reduce inflammation.

Cardiovascular exercise is good for your body on many levels but people either love or hate it. For some, it's because it feels uncomfortable and we spend most of our lives trying to avoid being uncomfortable. (Plus it's hard not to measure effort against others -- be it in the gym or on tv -- and feel discouraged if we have not led an active lifestyle.) Others become addicted to the feeling, or to the challenge of setting cardio training goals such as triathalons, road races, or cycling "centuries."

But regardless of where you begin, all that really matters is that you start. And that you continue. Gradually over time you'll increase your efforts and see more and more results.

Strength Training

Research now confirms that strength training is not just important to slow bone loss, it can actually add bone. Strength training creates a stimulus for new bone growth that is a treatment as well as a preventive for osteoporosis.

And since we know that muscles burn more calories than fat, being leaner and more muscular can help you with your weight goals as well.

You don't need to go to a gym or lift weights, though both can help if you don't know where or how to start. Functional body movements, like those you would naturally do each day in the times of old, like lifts and squats and push-ups are very effective strength builders. I love using the weight of the body as resistance

for increasing muscle strength; it's more natural to me than bands, balls or dumbbells. But you can also be creative and arm wrestle your kids, pump food cans like arm weights, carry your own grocery bags, or work on your core through pilates, power yoga or ballet.

Flexibility Matters

A good stretch after a work out feels amazing: we are instantly rejuvenated and energized. It releases muscle tension, prevents contractions, and can help prevent injury. But even if the workout came earlier in the day or it was a rest day, stretching still feels great and it increases the temperature of the body's tissues, which will increase circulation and improve the transportation of nutrients.

Eastern medicine teaches that tension prevents healing and blocks our energy and that our tension gets stored in certain spots in our bodies: just like a good massage, stretching can release that energy and unblock our muscles, our stress, and our minds.

There are number of structured programs such as yoga, chi gong or tai chi that can help you improve your flexibility and stretch open your body and your mind.

But you can also just put on comfortable clothes and lie down on the floor listening to music or your favorite tv show before bed and just relax and deeply stretch each area of your body, feeling your muscles lengthen and the oxygen and energy flowing freely.

Breathing to Improve Health

Breathing has been shown to lower your blood pressure as effectively as most medicines. Breathing regulates your autonomic nervous system, which impacts your immune system and can impact hormonal balance, kidney function, and bowel dysfunction in addition to regulating your high blood pressure.

One of the major benefits of exercise is bringing oxygen into the muscle tissues. If you breath deeply into the muscle while you are exercising, whether it is during a cardio, strength or flexibility workout, you can enhance the benefit.

If you cannot exercise because time prevents, deep breathing into the area you wish to direct oxygen is proven to have an impact. So while you are stuck in traffic or on the train, breath deeply into your key muscle areas, flexing and releasing or imagine them going through your favorite workout routine and you can still have some of the benefits you would have received had you actually exercised them.

FITTER Plans

Ok, so we know we need three kinds of exercise: something to get our heart rates up, something to build lean muscle and body strength, and something to elongate muscles and release blockages. A good exercise plan also needs to factor in the FITTER guidelines: Frequency, Intensity, Type, Time, and Rate of progression.

Frequency simply refers to how often you will do it. Let's say you are already fit and active, you may want to make a plan to exercise 5-6 times a week for 60 minutes at a time. If you are just beginning, your frequency may be more like 20-30 minutes 3-4 times a week. The key is to decide this in advance and lay out your work out plan for each week in advance.

Intensity refers to how hard you will work, or how high you will raise your heart rate.

Steady state lower intensity endurance training lays a foundation for fitness that enables you to build upon it without injury. Longer exercise duration also means more calories burned overall so it is an important component to fitness training. Interval training will improve cardiovascular capabilities and is also shown to burn more fat, so integrating interval training into your cardio will maximize health (and weight loss) benefits.

You can and should vary your intensity depending on your goals and your fitness level. Some workouts should be geared more toward endurance and building strength in your activity, while others should be chosen specifically as interval sessions designed to maximize your cardiovascular output. You will want to include both endurance and interval training over time.

Type is simply what type of exercise you'll engage in: running versus walking, outdoor vs. indoor, flexibility vs. strength vs. flexibility. Varying the type will enhance the benefits to your body by challenging your muscles in new and different ways, and will keep you from getting bored.

Time refers to how long you will exercise. Research now shows that an hour a day is necessary for mature women to maintain their weight levels due to slowing metabolism. The USDA also recommends 60 minutes of exercise a day for all. The 60 minutes does not have to be completed in one session, so you can break it into smaller workouts if that fits better into your day, but the goal should be to work your way up to an hour of rigorous exercise a day.

Rate of Progression references the fact that as you do something your body will adapt to it. So over time, you need to continually change your workout plan and make it different by incorporating new elements, making it longer, or making it more intense. If you have never lifted weights and you lift a 10-pound weight for a set of 12 repetitions 3 sets in a row, your arm will be sore the first time you do it. If you continue to do that same workout, over the coming days and weeks it will no longer be uncomfortable and eventually, it will be easy. Your body has adapted to that stress and is now able to handle it and respond. If you want to get stronger, you will need to vary the exercise you are doing, the weight you are lifting or the number of repetitions you are doing.

The same is true for cardiovascular exercise. If you are a beginning walker, it may be hard at first. But over time it will get easier, and you'll want to walk longer or faster. If you take the same indoor cycling class over and over, your body will adapt. So you need to either ride more classes, ride longer classes, or change the way you work within the classes you are taking, making some endurance and others interval classes.

This also holds true for walking or running or playing golf or any activity: vary the intensity levels, the terrain, the duration of the workout or the frequency, or cross train and mix in other activities into your plan if you want to continue to improve your fitness.

It is easy to measure most of those changes with your watch, your calendar, or your map, but intensity level can be harder to assess. Should you go purely by how it feels? Or do you need a heart rate monitor to guide you?

Heart Rate Monitors

Heart rate monitors can be great training tools, but most people don't use them effectively. If you have a medical condition and your doctor has told you not to go beyond a certain heart rate, they are very helpful in allowing you to monitor where you are more precisely. For most people, though, heart rate monitors are meant to be a guide for training, not an absolute.

There a number of concerns around using heart rate monitors that go back to the formula that is used to calculate optimal heart rate ranges. Some people have used the 220-your age method to establish max heart rate. This formula was never intended for use in the broad population; it was created for specific use with cardiac rehab patients.

The flaw with this is obvious as it implies that everyone at the same age has the same heart capacity, regardless of their fitness level, their weight, or their medical conditions. Lance Armstrong is no different than any other person of his age under this calculation. I don't know about you, but even at his age, I would not have wanted to go up against his numbers! It also says that triathaletes are in the same place as beginning walkers, and we know that is simply not true.

Another popular approach is to determine your target heart rate using the Karvonen method. This formula asks you to determine your resting heart rate by taking your pulse for a minute when you awaken in the morning. They suggest doing it three times/days and averaging the three numbers together.

But your true resting heart rate is the rate when your body truly is at rest, or at sleep. Once you wake up, a surge of energy flows through your body and your heart rate will be raised a little if you awaken naturally or a lot if your alarm goes off. So the number you get is likely higher than your actual resting heart rate truly is.

Then you take your age from 220 as discussed, which leaves you with a one size fits all number that is likely off by 10-30 beats per minute. From that number, you subtract the resting heart rate you took in the morning, which is likely overstated, to get your heart rate reserve.

Then they suggest that you use 60% as a low end and 80% as a high-end number and you multiply them by your heart rate reserve to get your low and high-end heart rate ranges, which you then average to find your target. But as you can see, at each step in the process, the numbers could be flawed. So this process can give you a guide, but it can – and often is – significantly off.

Follow your Heart

I often see people working until they reach the number they think is their max and then staying there, even if it feels comfortable. It is a concern because your fitness level is constantly evolving and your goal is to continually improve your max heart rate over time. Last year's numbers shouldn't be your guide this year because you – and your fitness level – do not stay the same. Another problem is that the number may not be accurate and I see people simply stop when they get there regardless of how it feels because they think they should stop and not exceed that number.

If you are feeling good that day and you reach what you think is near your max (and you do not have a medical condition preventing such), that's a time to push past and work a little harder. On the other hand, if you start working out and your mid range is feeling really hard, your body may be fighting something or you may need rest and that day, your max may be much lower and you need to honor that and listen to your body.

Instead of allowing the monitor to rule your workout, let it be your guide. If you decide to use a heart rate monitor, exercise at what feels like an easy comfortable pace and see where your numbers are. Take it up to moderate or medium and record your rate. And finally, take it up to what feels like really hard work to you and see where it leads you.

Do that three times, on different days, and you will have a good range for easy, medium and hard efforts. Let those be the numbers you shoot for in your

workouts. And on days where you can get to hard and it feels good, let that be a day to push past. When your body is resisting your medium workout, dial it back and keep it at an easier pace that day.

Working out in all zones is beneficial to the body and listening to your body on each given day will make your heart rate monitor work more effectively for you than following a formula can. Using how you feel (easy, medium, and hard on any given day) can be just as effective for many people as using a monitor. So whether you use a monitor or not, don't be ruled by numbers, follow your heart.

(And as always, please consult your doctor before beginning an exercise program!)

Type 3 Diabetes and Electropollution

Research increasingly shows that energy and electricity can interfere with our body's normal functioning. Cell phones, cordless phones, cell phone towers, microwaves and WiFi can affect us all at a cellular level and those who are more sensitive may experience a significant disruption in cellular function and communication. I believe we are going to hear a lot more about electromagnetic fields (EMFs) and their effect on our bodies in the future.

In the early tobacco days, physicians smoked in advertisements for cigarettes and what we now know to be the truth was being buried or had yet to be confirmed by reputable studies over time. Today, we are being told by manufacturers and some scientists that exposure levels are so low that they don't matter or that that energy simply won't impact our bodies. Nevertheless, manufacturers recommend cell phones be kept away from the body and cell phone studies with concerning results continue to emerge. One scientist noted that 67% of those studies not funded by cell phone manufacturers showed a damaging effect on brain DNA.

Other scientists have shown that our bodies have an energetic vibration or frequency that CAN be disrupted by exposure to other frequencies. In addition, while some may argue the impact is small, as our world becomes increasingly reliant on these products and we are bombarded by more and more frequencies, our cumulative exposure is continually increasing. No one has looked at the impact numerous years of exposure will have on us. One scientist, Devra Davis, who has studied cellphone radiation and has written a book about it called "Disconnect," says,"I do think I am looking at an epidemic in slow motion."

While it may be a raging scientific debate in this moment, fifty years from now, I believe that much like smoking, it will be quite obvious to us all why this electricity

is so harmful to our bodies. EMFs have already been shown to influence many conditions, including cancer. But for now, I want to share some new information about how EMFs may affect blood sugar levels and lead to -- or exacerbate -- diabetes.

One leading researcher argues that there are three forms of diabetes, not two. Type 1, which is genetic, is generally diagnosed at a young age and requires insulin injections for effective management. Type 2, which used to be called adult onset, is brought on by diet and lifestyle choices and can be prevented or managed through diet changes and exercise. (It no longer takes an adult lifetime to damage cell signaling, as you learned in the sugar report. Today, more and more children are being diagnosed with this preventable form of diabetes.)

Now Dr. Magda Havas of the University of Trent in Canada has shown that there is a third condition that is caused by the environment, not genes or diet. She calls it Type 3 diabetes and her research shows that “dirty” electricity and electromagnetic fields can alter blood sugar levels both in previously diagnosed Type 1 and 2 diabetics, as well as in people who have not been diagnosed with diabetes.

Her research, published in Electromagnetic Medicine and Biology, presents four case studies of patients affected by “dirty” energy. This is emerging research, so the numbers haven’t been quantified yet, but Dr. Havas estimates between five and 60 million diabetics are affected by this energy.

So what exactly is “dirty” energy?

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Dirty Electricity and Electromagnetic Fields (EMFs)

According to Dr. Havas, “dirty electricity” describes “electric power that has become corrupted by our use of modern appliances. Items such as CFL bulbs, cell phone transmission antennas, power supplies for portable computers, cell phone chargers, dimmer switches, variable speed fans and many other electronic devises that require a transformer to convert the voltage will “dirty” the electricity that enters your home. This form of dirty electro-magnetic fields (EMF) is invisible

to the eye, but has a biological effect on the human body and has been associated with a wide variety of illnesses."

While Dr. Havas' research is new, she is not the only one to write about EMFs. Many physicians and scientists, including Dr. Thomas Rau of the world-renowned Paracelsus Clinic in Switzerland, and others such as Dr. Weill, Dr. Mercola, Dr. David Carpenter and even the Environmental Protection Agency (EPA) have been warning about these concerns since the 1980s.

Dr. Rau is convinced that "electromagnetic loads" can lead to cancer, ADD, migraines, insomnia, arrhythmia, Parkinson's disease, back pain and difficulty concentrating. People who are super-sensitive to EMFs can get headaches, nausea, muscle aches, fatigue or skin irritations just from being around WiFi or cell phone towers.

Dr. David Carpenter, Dean of the School of Public Health at State University of New York at Albany has attributed up to 30% of childhood cancers to EMFs. Martin Halper, the Director of Analysis and Support for the EPA says, "I have never seen a set of epidemiological studies that remotely approached the weight of evidence we are seeing with EMFs. Clearly there is something here."

In 1989, the Department of Energy reported that, "It has now become generally accepted that there are, indeed, biological effects due to field exposure." And Dr. Andrew Weill, natural health expert, has said, "Electromagnetic (EMF) pollution may be the most significant form of pollution human activity has produced in this century, all the more dangerous because it is an invisible, insensible 'toxin.' "

Scientists and the government have known about these dangers for decades now, but the proliferation of wireless technology since then makes the risks greater than ever before, especially those who are more sensitive.

So what exactly does "dirty" electricity do?

The Effect of "Dirty" Electricity

Dr. Havas looked at the effect of dirty electricity on blood sugar levels in four different scenarios. In the first, the patient was a 54-year-old man who had not

yet been diagnosed with diabetes, but was considered to be “pre-diabetic.” In this case, the man’s blood sugar levels were found to be normal when he was outside fishing and camping and he had no blood sugar concerns. But when he measured his blood sugar inside his house, especially after working on a computer, he experienced blood sugar spikes.

The man’s blood sugar and the level of “dirty” electricity in his home were measured in the morning for nine days. The higher the level of dirty electricity, the higher his recorded blood sugar levels. On one day, he forgot to measure his blood sugar first thing and instead measured it later while working at his computer. It was shown to be higher than normal. He stepped away from his computer and measured it again 10 minutes later, and it had dropped 20 mg/dL or milligrams per deciliter.

The second case was a 57-year-old woman with Type 2 diabetes who uses exercise to control her blood sugar levels. In the study, she walked inside a mall (after hours when everything was shut down) for 20 minutes and her plasma glucose was shown to drop significantly after her exercise from above acceptable levels down to acceptable levels. When she used a treadmill inside her home for 20 minutes instead and conducted the same blood sugar measurements, her blood sugar was shown to increase after exercise!

In the third case, an 80-year-old woman with Type 1 diabetes who was taking insulin measured her blood sugar every morning for a week. Then she had energy filters installed in her house to remove the “dirty” electricity and she measured her blood sugar every morning for the subsequent week. The filters removed 98% of the “dirty” electricity in her home and her blood sugar dropped 33%; the amount of insulin she required to manage her condition was reduced by 75% as a result.

The final case study involved a 12-year-old boy with Type 1 diabetes who was sent to the hospital with very high blood sugar levels. He was given increased insulin until his blood sugar began to decrease and he was allowed to go home. Then, filters were installed in his home and his blood sugar dropped significantly as did the amount of insulin he required (to about half his former level). His younger sister, who had been diagnosed with Type 1 diabetes at the age of three

months, also saw her insulin levels significantly reduced after the filters were installed.

In another part of the study, Dr. Havas put patients on beds with cordless phones two feet away from their heads. The phone was plugged into the wall, and either turned on or off for each session, though neither the patient nor the doctor administering the test knew whether the phone was on or off.

Patients who were sensitive to EMFs experienced significant increases in their heart rates when the phone was powered on, and their normal heart rates returned almost instantly once the phone was turned off again.

How do You Know if You Have Type 3 Diabetes?

If you experience unexplained blood sugar spikes, you may want to look into whether you are sensitive to “dirty” energy. If your blood sugar levels change based on your environment (test levels when you are outside in nature and at the same time when you are inside your home) or you have difficulty regulating your blood sugar levels for reasons you cannot identify, it’s worth exploring this further. One simple and easy way to test is to measure your blood sugar before and after exercising on electronic exercise equipment. After exercise, your blood sugar levels should be reduced; if they increase, you are energy sensitive.

While we are all vulnerable to “dirty” energy exposure, it is unknown how many of us are sensitive enough to experience such measurable disruptions. The case studies Dr. Havas presents are just a small sample, but knowing you are sensitive to “dirty” electricity may be critical for improving your health and wellness. Because many doctors remain unaware, you may need to be proactive in exploring the reasons behind your blood sugar variations and the appropriate actions you can take to help restore balance.

How to Reduce Exposure to Electropollution

Even if you are not sensitive enough to “dirty” electricity to see a physiological manifestation like heart rate increases or blood sugar level spikes, we are all bombarded with electropollution on a daily basis and many experts agree that minimizing our exposure makes good health sense for us all.

The first step you can take is to test your home. The website EMF Safety Store identifies and summarizes various meters you can use to measure EMFs and offers filters to mitigate “dirty” electricity. Filters will capture the electrical noise from things like televisions, computers and phones and filter it out of your house and back into the line or the ground.

Whether you test or not, try to reduce exposure to cell phones, cordless phones, WiFi, microwaves, electric blankets and heating pads. Keep wireless routers and cell phones away from your body and be sure your router is removed from any area where people sleep or spend a lot of time. (Sometimes even a few feet can make a difference, but the further away, the better. I keep mine in my office at the opposite end of the house from the bedrooms and family living area.)

At night, turn off phones, your router or any other electricity emitting devices. And never walk around with a headset on your head. Headsets deliver a steady stream of radiation, even when you are not speaking: They serve as a tractor beam of sorts for EMFs. If you must use a headset, take it off when you are not speaking.

Spending more time outside and away from all our gadgets, appliances and technology is a great way to recharge, reconnect and to reduce our exposure to “dirty” energy. And while you are outside, you can get some vitamin D and increase your health benefits at the same time!

5 Supplements Every Adult Should Take (Part 1)

There are five supplements I think every adult should take. The first one is a whole-food based multivitamin.

A recent article in *Reader's Digest* called vitamins a scam and said that taking them is a waste of money. It cited a study of 160,000 mid-life women that showed no difference in health with respect to the big diseases like cancer, heart disease and stroke, from taking a multivitamin. But as with all studies, you need to dig deeper—in this case because not all vitamins are created equal. (I am always suspect when a magazine whose advertising is largely from pharmaceutical companies says vitamins are worthless.)

The article challenges the benefits of certain individual supplements, such as vitamins A or E, which will likely have little, if any, effect when taken in isolation without proper co-factors. The article does recommend one standalone vitamin that should be taken by everyone: vitamin D. I've discussed the importance of vitamin D in another chapter and the rampant deficiency among children and adults today, so I couldn't agree more. Vitamin D3 can stand on its own and I take it daily; most other vitamins need to be taken together as part of a complete nutritional package.

Eating a whole food and plant-based diet will go a long way toward staying healthy and I strongly recommend we do both. We cannot eat too many dark leafy green vegetables and we should be eating the rainbow (fruits and vegetables that cover every spectrum of color from white to orange, red, green and purple.) But I also take a whole food multivitamin and a whole food raw green superfood powder, because the truth is, it is very difficult to get the

nutrients we need from our modern food supply.

These days, to offset the bad fats and processed food sugars we consume and to restore balance within our bodies, we need more vegetables than ever. We are not just eating to fuel our bodies, we are eating to heal our bodies from the inflammation and oxidation of our processed diets. It's getting harder to get the nutrients we need because in addition to the packaged and prepared foods in our diets, our fresh food supply is not as vitamin rich as it used to be. Soil has been depleted of nutrients, food is sprayed with chemicals and pesticides or is genetically modified to grow bigger or to resist disease, and then it is transported hundreds or thousands of miles to get to our tables.

If you go to a farm or a market and buy fresh produce, you know that after a few days on your counter, it will begin to go bad. Now think about the grapes or tomatoes you are buying from the opposite coast or from South America. They were picked, packaged and then shipped (sometimes by barge) to the U.S., sent out by truck across the country to your local market, displayed on the shelf for several days and then finally taken home.

For the produce to survive that trip looking fresh and beautiful and without bruising, it is heavily sprayed with chemicals, and picked before it is ripe and allowed to mature along the way. Once the fruit leaves the vine, it doesn't get the sun and the nutrients any longer, it doesn't fully develop the enzymes and phytonutrients that are usually present in mature fresh picked local produce.

(I talk a lot more about organic versus local and making better fruit and vegetable choices in the chapters on produce, but you should also know that many chemicals and pesticides banned in the U.S. are still used freely in the foreign countries from which we buy produce.)

Studies estimate more than 50% of nutrient value is lost in the journey from farm to table. So even if you are doing your best to eat a lot of good fruits and veggies, unless you have access to a local farm, it is hard to get food with the nutritional profile you need for health. Then you'd have to eat a lot of it, and how many of us can sit down and eat a bunch of tomatoes or a basket full of kale. You'll feel full long before you can finish, especially if you paired it with a big piece of meat

protein or dairy.

While I fantasize about growing my own food, here in New England, with a long, cold winter and a busy life with two kids and work, it's not possible at the moment. I do my best to shop at local farmers' markets for fresh produce, and I buy flash frozen organic produce when I can't. But despite my best efforts, I do not believe that I can get the nutrition I need without taking a multivitamin (my kids take one too).

But there is a big difference among multivitamins. There are natural organic whole food based products that when manufactured correctly leave the integrity of the whole food intact.

When looking for a good whole food supplement, keep in mind that whole foods are just that: whole foods. Look for ingredients such as carrots, spinach, wheat grass, spirulina, kale, celery etc. There will be vitamins listed as well but their sources will also be present: The original foods from which they were derived. When the ingredient list reads more like a science report than a grocery list, and there are no food sources included just isolated chemicals, it's typically comprised of manmade synthetic compounds.

Because synthetic vitamins are created in a lab to simulate the real thing, they are often not identical in the way they interact with or are absorbed by the body. They are often missing minerals, nutrients and other requisite co-factors for assimilation. In addition, they often contain cheap fillers and binders from ingredients like sand and titanium dioxide, dibasic calcium phosphate and microcrystalline cellulose, they are ingredients that our bodies cannot absorb and that may even be harmful to us. Many common over-the-counter vitamins are passed through the stool whole and intact. (Centrum is famous for this).

Taking a multivitamin that includes a broad spectrum of vitamins, minerals and nutrients can make a difference, but only if it is bioavailable and bioabsorpable; in other words your body can actually break down and absorb the nutrients. That is not possible with synthetic vitamins. I prefer a whole food-based product that is as close to what I should be eating as possible, and made from the real thing, not created to imitate it.

Interestingly the *Readers Digest* article's main argument against taking multivitamins said, *"These days, you're extremely unlikely to be deficient if you eat an average America diet, if only because many packaged foods are vitamin enriched."*

Think about that for a moment.

Food manufacturers strip out all the vitamins that exist in the food during the manufacturing process. Then they "enrich" them, by adding back cheap lab-created imitations. They want us to believe that these created versions are the same as the original, but research shows they are not: you cannot duplicate naturally occurring nutrients from synthetic ingredients. In addition, they will be missing enzymes and cofactors required for assimilation. When I see "enriched" on a food label, I know to stay away.

The truth is that enriched foods do not add vital nutrients to our bodies, nor will synthetic vitamin pills. The best way to get what we need is from the whole food source. Nature intended us to eat vitamins, minerals, trace minerals and phytonutrients together as they work synergistically. When whole food supplements are made the right way, they maintain a multitude of the plants original components and the integrity of the food source.

So eat as much good stuff as you can. Buy local when you can, organic if possible. But given the nutrient levels in today's soil and ultimately, food supply, along with the long transit times and warehouse distribution processes, even if you eat really well, you probably won't get all the nutrients you need from food. Most -- if not all -- of us will still need to supplement with a whole food-based supplement to bridge the gap for long-term health and wellness.

Heart Health is Only the Beginning

The Five Supplements Part 2

This is the second of five chapters on the five supplements I think every adult should take. The first was a whole-food based multivitamin. The second is a form of CoQ10. Ubiquitous means to exist or to be everywhere; to be omnipresent. From the same word source comes the second supplement I think virtually everyone should be taking: **ubiquinol**.

Ubiquinol is the active and reduced form of CoQ10 (also known as ubiquinone). CoQ10 is found in every cell of the body and performs a critical role in cellular energy production. It also protects against free radical damage, which affects the aging process on numerous levels. While both ubiquinone and ubiquinol are necessary for sustaining life, ubiquinol is the source of the powerful antioxidant benefits that we often associate with CoQ10. More than 90% of the CoQ10 found in a healthy person's blood is in the form of ubiquinol.

You've probably heard about free radicals, even if you don't know how they affect you. Free radicals are oxygen atoms deficient in electrons that become reactive in our bodies. They then wander "freely" through our bodies and cause damage to our tissues and DNA. Most experts agree that if we could reduce the free radical damage, we could slow down the damage that occurs in our bodies as we age. Ubiquinol can help because it limits free radical production.

CoQ10 also helps in the production of adenosine triphosphate (ATP), the energy base for all our cells. But your ability to produce CoQ10 and then convert it to ubiquinol, even if you eat whole unprocessed foods, diminishes as you age. If you are under 25 years old, you will do well taking CoQ10 as a supplement. But after age 25, the conversion process becomes more challenging and research shows that taking the reduced form, ubiquinol, has a greater effect on helping to produce more cellular energy. Taking ubiquinol can also help you absorb more CoQ10 from your food.

In addition to free radical protection and increased cellular energy, ubiquinol can improve heart health. (I address its role in combating the oxidation that can occur with small dense LDL in the cholesterol chapter.) Ubiquinol has also been shown to help manage high blood pressure and to benefit seriously ill patients suffering from advanced late-stage congestive heart failure.

In one study, critically ill patients with life expectancies of less than six months were given ubiquinol for three months. They experienced a 24%-50% increase in their heart's ability to pump blood, in some cases tripling their plasma CoQ10 levels. They all demonstrated significantly improved heart function and lived past initial expectations.

Statins lower cholesterol on the same pathway that your body uses to produce CoQ10. Research shows that CoQ10 production is significantly reduced by statins so ubiquinol supplementation is a must for anyone taking those drugs.

While ubiquinol is clearly tied to good heart health, its ability to mitigate free radical damage and support base cellular energy functions is not fully understood. Ubiquinol has only been available in supplement form since 2006, but what we have learned in that limited time is impressive.

Ubiquinol is important to many key processes in the body because it supports basic cellular level functions, so the benefits are likely far beyond what can be cited through the limited research available now. Whether heart health or anti-aging is a concern, the research that does exist now is compelling enough to recommend this supplement. And I believe we'll learn even more about how important this vitamin-like substance is to many health functions in the coming years.

Don’t Forget Your Fiber

Five Supplements Part 3

The third supplement I think every adult should take is fiber. Fiber is commonly known for keeping people regular, but did you know that it also helps prevent heart disease and Type 2 diabetes? Fiber is best delivered naturally by eating plant foods, grains and legumes, but most of us don’t eat enough fiber and are deficient in this vital nutrient. It’s not only important to eat enough fiber, but to eat it at the right time as well.

Fiber is a carbohydrate that our body does not digest or absorb. Fat, protein and other types of carbohydrates are broken down and then absorbed, fiber passes through your stomach, small intestine, colon and ultimately out of your body, intact. There are two kinds of fiber necessary for healthy digestion: soluble, which means it dissolves at least partially in water, and insoluble, which does not dissolve in water.

Insoluble fiber helps with movement through the digestive system. It also increases stool bulk and can assist with regularity. Wheat bran, nuts, vegetables and whole-wheat flour are some sources of insoluble fiber. Soluble fiber dissolves into a gel-like material and helps to lower blood cholesterol and glucose levels. Carrots, peas, beans, apples, citrus fruits, oats, barley and psyllium are examples of soluble fiber sources.

Fiber helps with regular bowel movements and in maintaining bowel health. Some evidence suggests that a high fiber diet can lower the risk of developing hemorrhoids and diverticular disease (when small pouches develop in your colon).

But fiber does more than just keep us regular; it also helps with weight loss and weight maintenance. It slows the absorption of sugar, which helps control blood

sugar levels for those with diabetes and has been shown to reduce the risk of developing Type 2 diabetes. Fiber also helps with heart health by lowering cholesterol levels, reducing inflammation and lowering blood pressure.

With all these great benefits, fiber is definitely something we should get more of. But many experts say we are a fiber-deprived nation. According to the National Academy of Sciences' Institute of Medicine, men under age 50 need at least 38 grams of fiber a day and women of the same age need at least 25 grams. Men over age 50 need at least 30 grams a day, and women need 21. It's important to note that recommendations are tied to overall caloric intake, so if your daily calorie intake is higher, you need more fiber. And overall, according to the Harvard School of Public Health, more fiber is better.

The typical American consumes 15 grams of fiber a day or less, so most of us have some catching up to do on our fiber consumption. Fiber levels vary significantly by food source, so it's important to look at what you're eating to assess how much more fiber you need to consume. Refined or processed foods have little fiber content because the process of grain refinement strips the outer coat or the bran from the grain. Taking the skin off fruits or vegetables will also yield less fiber.

Studies show that whole-grain cereal fibers such as wheat and oat bran have good amounts of fiber, but there's less research seen on vegetables because it's easier to brand an oatmeal product than a banana. We often think of bread or whole wheat as a good fiber source, but one slice of whole-wheat/whole-grain bread has only 1.9 grams of fiber, while whole-wheat spaghetti brings in 6.2 grams per cup.

A medium banana or orange yields about 3 grams of fiber, while a cup of raspberries contains 8 grams. A medium carrot contains 1.7 grams and an ounce of almonds (about 23 nuts) contains 3.5 grams. But the real bounty lies in vegetables and beans. A cup of peas comes in at 8.8 grams, a medium artichoke at 10.3 grams, a cup of black beans has 15 grams, lentils 15.6 grams and a cup of split peas packs 16.3 grams of fiber.

In addition to making sure you're getting the correct overall level of fiber, it's

important to consume fiber with every meal to balance blood sugar levels and to inhibit weight gain. This occurs in several ways: Fibrous foods take more time to chew and so allow time for the signal to reach your brain indicating you are full and should stop eating. Fiber rich foods also tend to make you feel fuller longer, so you eat less.

Fibrous foods tend to have fewer calories by volume than non-fiber rich foods, so eating the same portion size of a food rich in fiber will likely mean you're eating fewer calories than in a low fiber food. Any time you eat food with high sugar content in isolation, it's more likely to be stored directly as fat than if it is eaten in the context of a balanced meal. If you eat on the run a lot and find it hard to eat fresh vegetables or beans with your meal, keep a fiber supplement handy and take it with your meal.

It's important to keep in mind that some of the fiber sources listed above are also high in sugar content. Bread and pasta—even whole-wheat versions—are higher on the glycemic index, as are many fruits and even a few vegetables, meaning they will raise blood sugar level. While they are certainly better than empty calorie processed foods, it's better to focus more on beans and vegetables, particularly green vegetables, as fiber sources. If you do eat a lot of bread or fruit, try consuming them in combination with vegetables, beans or a fiber supplement.

In America, we often drink our meals, whether it's a smoothie, a rich coffee drink or alcohol, all of which are high in sugar content. If you're having a liquid meal or drinking anything with high sugar content without an accompanying meal rich in fiber, take a fiber supplement along with your beverage to mitigate blood sugar spikes and to inhibit that sugar from being stored in your body as fat.

Every time I eat a meal or snack, or drink anything with sugar, I either eat or take in supplement form a small amount of protein, fiber and healthy fat, like omega-3s. I also keep extra fiber handy to supplement anytime I eat something not fiber rich. Ensuring that my body has that healthy combination of protein, fat and fiber helps manage blood sugar, keep hormones balanced, and maintain my weight, even if I indulge.

When possible, try to eat a diet rich in fiber from a variety of sources. We tend to

eat the same foods over and over again -- our go-to favorites -- but variety in type and source of fiber, as with all nutrients, is important. So mix it up, but also supplement as needed with capsules or powder containing both soluble and insoluble fiber to ensure your meals and snacks are balanced.

Fiber pills are handy to take when away from home and easy to swallow along with whatever liquid you are consuming. I prefer fiber in pill form, as I can take my base dose in the morning with my other supplements and have additional pills on hand for any time my meal or snack is imbalanced.

Powder forms are another option, as they are readily available, inexpensive and they work fine when you mix them into a smoothie or a liquid you are already drinking.

One caveat: When increasing fiber consumption, do so gradually over the course of several weeks as overloading your body too rapidly can cause gastrointestinal distress. And to be most effective, fiber needs water, so be sure you adequately hydrate as you increase your fiber intake.

Why You Should Be Taking Omega 3

Five Supplements Part 4

The fourth supplement every adult should be taking is one you've likely heard a lot about: omega 3. Research shows that 99% of us are omega 3 deficient, and a recent study at Harvard directly linked omega 3 deficiency to death in an estimated 72,000-96,000 people a year. To put that in context, there are approximately 40,000 deaths a year from breast cancer. Clearly, we need to start paying more attention to omega 3.

Omega 3s help reduce internal inflammation, which is linked to almost every chronic condition that plagues us. They play a very important role in heart health: Inhibiting thickening of the arteries, lowering the amount of lipids that circulate in our bloodstream, and helping arteries to relax.

Omega 3s can reduce obesity by stimulating the hormone leptin, which regulates food intake, body weight and metabolism, and they help prevent cancer cell growth. Omega 3s can also reduce depression, improve mental clarity and focus, reduce dry or itchy skin, improve hair and nails, and help prevent autoimmune disorders and Type 2 diabetes.

Three Types of Fatty Acids

Omega 3 is an essential fatty acid. Fatty acids fall into three groupings: saturated, monounsaturated and polyunsaturated. Each type is made up of carbon atoms with hydrogen atoms that fill in the spaces around them.

In saturated fatty acids, all of the spaces around the carbon atoms are completely filled in, i.e., saturated. As a result, they are very stable regardless of temperature. Saturated fatty acids are found mainly in dairy, red meat and chicken, but they can also be found in tropical oils like red palm oil and coconut

oil. Our bodies can also make some saturated fat from eating carbohydrates.

Monounsaturated fats have a double bond between two carbon atoms and are missing two hydrogen atoms. They are called mono because of their single carbon double bond and unsaturated because not all of the spaces are filled—two hydrogen atoms are missing. Because the chain can bend at the double bond point, when you mix a large number of these chains together, it won't be dense or compact; there will be room in between. As a result, these acids are usually liquid at room temperature and are relatively stable, though not as stable as saturated fats because they are not packed as tightly. The most common monounsaturated fat is oleic acid and examples are olive oil, avocados, peanuts, cashews, pecans and almonds. Your body can also make monounsaturated fat from saturated fat.

Polyunsaturated fats are missing several hydrogen atoms and they have two—or more—double bonds. As a result, since there is more than one double bond, they are called poly, meaning many. At each double bond, there is a kink in the chain, so they tend to be very loosely packed and remain liquid, even in colder temperatures. They are highly unstable fats and they can go bad (turn rancid) easily when exposed to heat and light.

When polyunsaturated fats turn rancid, free radicals are created and travel around in your blood causing damage to just about everything they interact with. Free radical damage has been tied to cardiovascular disease, autoimmune diseases, Alzheimer's, Parkinsons's, cataracts, tumors and aging. The most common polyunsaturated fatty acids are omega 3 and omega 6 fatty acids. They are called essential fatty acids because our bodies cannot make them; we must get them from the food we eat.

Omega 3s can do a lot of good. But rancid omega 3s can do a world of damage. We need omega 3s, but we need to ensure that they do not turn rancid in our bodies. Antioxidants will mitigate this, so it's important to take antioxidants regularly along with omega 3s. If you don't want to buy both, there are fish oils out there that add the antioxidant Astaxanthin to the oil, which alleviates this concern. Or you can try krill oil.

Krill oil is a very pure omega 3 source and also contains antioxidants to help mitigate any free radical damage that may occur if oils turn rancid in your body. Recent studies on Neptune Krill Oil have documented its benefits on a number of health conditions, so I can definitely recommend Neptune Krill Oil.

Balancing Act: Omega 6 Versus Omega 3

Let's go back to omegas 3 and 6. Omega 6 sometimes gets a bad rap but the truth is that we need both of these essential fatty acids. The challenge in today's food supply, however, is that omega 6 acids are used heavily in processed foods. Vegetable oils such as corn oil, sunflower, soybean, canola, cottonseed and safflower oil contain at least 50% omega 6 and very little omega 3. Beyond the vegetable oils in packaged and prepared foods, most people rely heavily on these vegetable oils for their in-home cooking, which is a concern. (I do not even have a bottle of any of the above oils in my house.)

In addition, factory farming reduces the amount of omega 3s in meat, fish, eggs and vegetables. I've read that a chicken that is free to eat its normal diet of grass and bugs will lay an egg that is a perfect balance of omega 6 to omega 3. However, the traditional vegetarian grain-fed chicken will yield an egg that is more like 20:1 omega 6 to omega 3. Nature undisturbed knows to work in perfect balance, but our changes in farming have disrupted that balance and left us with an overabundance of omega 6.

Ideally, we need a 1:1 ratio of omega 6 to 3, but our bodies can still cope fairly well with up to a 4:1 ratio. Unfortunately, the typical American diet is more like a 20:1 and can be up to a 50:1 ratio of omega 6 to omega 3. This is one reason it's so important to supplement omega 3s. Not only do we need them in isolation, but we need them to balance our omega 6 intake.

An imbalance of omega 6 and omega 3 will prevent all of the wonderful health benefits I mentioned at the beginning of this chapter. In addition, an unbalanced ratio that favors omega 6 over omega 3 can lead to weight gain, sterility, high blood pressure, digestive concerns, blood clots, inhibited immune function, inflammation and even cancer.

Three Omega 3 Essential Fatty Acids

How do we get omega 3s back in balance? I recommend you eat a varied whole food diet to get the three types of omega 3 essential fatty acids: ALA, EPA and DHA.

ALA or Alpha-Linoleic Acid is found in dark green leafy vegetables, flax and hemp seeds, walnuts and vegetable oils. EPA or EicosoPentaenoic Acid is found in cold-water fish like salmon, tuna, cod and mackerel and in seaweed. It can also be found in grass-fed beef and free-range (non-vegetarian fed) eggs in smaller amounts. DHA or DocosaHexaenoic Acid is found in the same foods as EPA.

Eating abundantly from these food groups will ensure that you have ample healthy fatty acids and a good balance of them in your body. If needed, the body can convert ALA to EPA or DHA, though the conversion process is slow. While we probably cannot overdo our dark leafy green vegetable consumption, supplementating ALA at high levels has been shown to have some adverse effects on the body. So when taking omega 3 supplements, EPA and DHA are generally recommended.

Increasing omega 3 consumption overall is important, but so is ensuring that we have a healthy balance of omega 6 to omega 3 at every meal. I try to pay attention to my omega 3 food sources, as well as restrict my consumption of omega 6 laden foods and oils, but given modern farming practices and the overabundance of vegetable oils in foods, I still feel the need to take an omega 3 supplement with **every meal** to ensure I stay in balance.

While I prefer pills because they tend to be more stable and they are more portable, my daughter hates pills but will drink a spoonful of fish oil. Today, fish oil often has a citrus flavor and is no longer a challenge to swallow, especially when mixed into a drink. Choose a brand that screens for impurities like PCBs and mercury and keep it in the refrigerator or away from heat and light. If it smells funny or changes color, throw it out.

Because of its proven absorption and extensively studied research benefits, as I mentioned earlier, Neptune Krill Oil may be the best supplement option available. Many people I know have switched from taking fish oils to only krill oil, while

others take both, but choose a fish oil with antioxidants or take an antioxidant supplement such as astaxanthin along with it. Whatever option you choose, adding fish or krill oil into your supplement routine has proven benefits. Making sure your diet is rich in antioxidants is also a good way to prevent potential damage from any oil that may go bad.

One caveat: Omega 3s can exaggerate the effect of prescription medications that are trying to do the same thing. For example, if you are on blood thinning medications like Coumadin, Plavix or even aspirin, you should discuss omega 3 consumption with your physician because it can be a blood-thinning agent. And while omega 3 can be a helpful part of insulin and diabetes management, it can raise fasting blood sugar levels, so if you are on blood sugar medications such as Glucotrol and Glucotrol XL, Micronase or Diabeta, Glucophage or insulin, talk to your doctor as your dosage may need to be adjusted.

The Dangers of Vitamin D Deficiency

Five Supplements Part 5

This is part five of a series on the supplements I think every adult should take. Previous issues focused on whole-food based multivitamins, ubiquinol, fiber and omega 3.

The final supplement on the list is vitamin D, which is made in our bodies through sun exposure. But today, we simply don't get enough direct exposure to sunshine, without sunscreen, to make the vitamin D we need.

Vitamin D helps with bone health by facilitating calcium absorption. It also plays an important role in many other healthy body functions. Vitamin D has been shown to improve immune health and heart health, protect against cancer, autoimmune diseases, depression and a host of other conditions.

Vitamin D deficiency is a major cause for concern as it affects multiple systems in our bodies. Vitamin D deficiency is far more pervasive than previously believed, with research now indicating virtually all adults and children have lower than optimal vitamin D levels.

The only way to know how much vitamin D you need on a daily basis is to get your levels tested a couple of months after you begin to supplement. You want to see levels of 125-200 nmol/L, or nanomoles per liter. (Sometimes test results are reported in nanograms per milliliter or ng/ml. It's the same test, just a different measurement: Like miles per hour versus feet per second. If your test results are in ng/ml, you will want to see at least 50 ng/ml for optimal vitamin D function.)

Estimates now suggest that 5,000 International Units, or IU, of vitamin D a day or 35 IU per pound for kids or heavier people is appropriate. But some of us need

more: I was recently listening to a renowned brain expert say that as a physician, he was shocked (since he lives in southern California and is exposed to sunshine all year) when he found out after vitamin D testing that his body required 10,000 IU a day to function at its optimal level

My whole food multivitamin contains 5,000 IU of vitamin D3 and I get plenty of daily summer sunshine, so I don't take a supplement in summer. But most multivitamins have shockingly low levels of vitamin D3. So even if you are taking a good whole-food multivitamin, you'll most likely need to add some D3, unless you get time outside without sunscreen every day. And even though my multivitamin provides a good baseline, I still find that I need to supplement with an additional 1,000-2,000 IUs of vitamin D3 during the long New England winters. Unless you are in a warm weather climate, you probably will too.

If you haven't read the full chapter on vitamin D, you should. Before we leave the topic of supplements, I want briefly mention three other supplements that did not make my top five list that you may want to consider: collagen, probiotics and DIM.

Collagen

If you read the chapter on bone health, you know how important collagen is to avoiding bone fractures. You can and should get your collagen from eating good collagen-rich foods like dark green leafy vegetables. But if you find—like many—that you may not be eating enough collagen and you are not taking a good whole-food multivitamin, you may want to consider collagen supplementation.

As I shared in another chapter, in order to maintain my weight and to prevent blood sugar issues, I try to eat small amounts of protein, healthy fats (omegas 3s) and fiber at every meal or snack. If I am ever in a situation where I am not consuming protein, I will take a collagen supplement (and a fiber or omega 3 supplement if needed) for balance. While not nearly as good as eating the right foods, in a pinch, it's better than taking in carbohydrates (sugar) without any having protein to balance it out since carbs ingested without a protein counterbalance are stored as fat in the body.

Probiotics/Digestive Enzymes

We've all heard of antibiotics: They kill off or inhibit the growth of bacteria. But antibiotics also kill off the healthy bacteria in our digestive tract and inhibit our ability to digest food and to absorb nutrients. Probiotics contain the beneficial flora that your digestive system needs and digestive enzymes that work in your stomach to help break down foods. Both can be damaged by illness, poor diet and antibiotics, so if you have experienced any of those and have not taken a course of probiotics and enzymes afterward, your digestive system is likely not operating at top capacity.

Probiotics and digestive enzymes are also a must if you have digestive concerns such as cramps, constipation, diarrhea, gas or bloating or Irritable Bowel Syndrome. If you struggle with allergies or asthma, food sensitivities such as sugar or gluten, yeast infections or urinary tract infections, rosacea, acne or skin conditions, headaches or migraines, chronic bad breath (halitosis), PMS or hormonal imbalance, or achy joints, you should consider probiotic supplementation.

Depending on how long and how strong your course of antibiotics was, or how severe your digestive concerns are and what your diet is like (if it is very acidic), you may want to stay on probiotics for a while to ensure balance is restored and maintained. At a minimum, you'll want to take probiotics and digestive enzymes while taking antibiotics and for several weeks afterward. A two to three month supplementation cycle is great for restoring balance and digestive health after any significant stress to your digestive system. Eating yogurt can help, but your body most likely needs more help than yogurt alone can provide.

Even if you haven't had antibiotics lately or faced a digestive health concern, your system could still be imbalanced from a concern long ago. Probiotics can help restore balance if you have a heavily acidic diet that promotes yeast and causes other imbalances in your digestive pathway. I recommend a month (or two) of probiotic and digestive enzyme supplementation every year to help ensure your digestive system has everything it needs to maximize the nutrient absorption of the food you are eating.

There are many different probiotic strains and each works differently in the body, so you may need to experiment with more than one brand to find the right one. If you are facing a specific issue, research your condition to find the best strains. The right probiotic should make a difference within the first week or two. If you don't see improvement after two weeks, try another brand with different strains of bacteria. If you are just looking to restore balance annually with no specific concerns, choose a highly rated probiotic that has bifidobacteria and lactobacillus acidophilus in the billions.

DIM or Diindolylmethane

Diindolylmethane, or DIM, promotes healthy hormonal balance through beneficial estrogen metabolism. DIM is a naturally occurring phytonutrient found in cruciferous vegetables (like broccoli, cabbage or collards), which we know are good for us, but do not eat nearly enough of. DIM can balance estrogen by blocking "bad" estrogen and promoting good or beneficial estrogen in our bodies.

For women, healthy estrogen metabolism prevents breast, cervical and uterine cancers; for men, it is required for prostate health. (Men, you have estrogen in your bodies and are exposed to it in foods and the environment as well, so it's just as important for you!) I speak more about the connection of DIM to prostrate health in the chapter on Prostate Health.

Not everyone needs DIM, so it didn't make my top five list. But if you're concerned about hormonal balance, fibers, tumors or reproductive cancers or prostate health, DIM is a supplement you should consider taking daily. (I found it quiets my hot flashes.) Generally speaking, unless cancer runs in your family, you are perimenopausal or suffer from pre-menstrual syndrome and/or you are already struggling with reproductive issues like fibroids or hysterectomy, it's something you can wait to take until you're in your 50s.

Research has shown that most DIM supplements cannot be absorbed; they require microencapsulation. Only one company, BioResponse, has a patented microencapsulation with extended release nanoparticles, ensuring predictable absorption. This company is the only brand being used in all the published clinical trials, including those sponsored by the National Cancer Institute, so it's

the one I take and recommend.

Fragrances, Dyes, and Preservatives: Oh My!

Most of us know that eating foods with artificial flavors and colors, dyes, chemicals and preservatives is not the best strategy for fueling a healthy body. But despite the fact that many of us are now choosing organic and local, grass fed and hormone free, if you shop at your local drug store or big box store for your cosmetics and toiletries, most likely you are continuing to ingest the very chemicals you are trying to avoid in our food supply.

The products you put on the outside of your body are absorbed into your blood stream and impact your health just as much as the food that you eat. In fact, **twice as many toxins can be absorbed into the bloodstream through skin as through the digestive tract**. If you are not convinced of that, try the old garlic test. Rub garlic on the bottom of your foot and within twenty minutes you will taste garlic and have garlic on your breath just as if you'd eaten it.

I would be remiss in my wellness coverage if I did not take a chapter to discuss some of the common toxins contained in your cosmetics and toiletries and why you should avoid them.

Before I get into the specifics of each chemical group, I want to remind you about estrogen disruptors, which were discussed in the prostate chapter.

…We are daily bombarded with estrogenic compounds called xenoestrogens. These compounds can mimic estrogen and take up estrogen receptor sites, leaving the body's estrogen to wander looking for an available receptor site. This excess estrogen imbalances our normal hormone ratios. Xenoestrogens are found in petroleum-based products, plastics, herbicides, pesticides and fungicides. They are in car emissions, paint, nail polish, soap, lotion, food, water and the air. Xenoestrogens result in an increase in belly fat or breast development in men as well as weight gain, allergies, sinus infections, fatigue, mood swings and the onset of andropause, the male equivalent of

menopause. Andropause can result in impotence, low sex drive, low sperm count, low absorption of zinc, increased risk of heart disease, and not surprisingly, urination and prostate problems.

Hormones are always about balance, and our sex hormones are no different. Endocrine disruptors result in hormone imbalances that not only mean testosterone or progesterone levels are low vis a vis the estrogen, but excess estrogen levels are linked to breast, prostate and uterine cancer as well as autoimmune diseases and osteoporosis. Several of the chemicals we will look at can be classified as endocrine disruptors and I won't repeat this detail for each but will simply label them as such.

Parabens

Parabens are preservatives that are used to extend a product's shelf life. They are known carcinogens and endocrine disruptors. While they can also cause allergic reactions and skin rashes, their primary concern is as an endocrine disruptor. Next to water, parabens are the single most frequently used ingredient in cosmetics, so a look through your bathroom shelves will likely turn up plenty. **Look for methyl, butyl, ethyl or propyl parabens on the label.**

Nitrosamines

When ammonia compounds and nitrates combine, nitrosamines are created. We discussed the harmful impact of nitrosamines in the meat chapter and how we need to avoid eating them. So why would we want to absorb them directly into our blood stream through shaving cream, shampoo or shower gels? Nitrosamines are used as skin softeners, foaming agents, synthetic stabilizers and ph adjusters. No other carcinogen has been found to be as harmful to as many species as nitrosamines and the challenge with nitrosamines is that studies reveal that levels increase within a product after it's opened, doubling after four months and increasing more than four times over seventeen months. Even more reason to toss that old shampoo bottle in your bathroom! **Look for MEA (Monoethanolmine), DEA (Diethanolamine), or TEA Triethanolamine) on the label. It will often occur in tangent with another chemical such as TEA Lauryl Sulfate or Stearamide MEA, for example.**

PAHs (Polycyclic Aromatic Hydrocarbons)

PAHs are derived from crude oil and are known endocrine disruptors and carcinogens and have been directly linked to breast cancer. Their purpose is to form a barrier on the skin, which is why they are commonly found in diaper rash ointments and skin creams. They are also frequently found in lipsticks and lip balms as well as baby lotions and oils. **Look for petrolatum, mineral oil, paraffinum, coal tar, and yes, petroleum jelly (the name tells it all!)**

Propylene Glycol/Butylene Glycol

Propylene Glycol/Butylene Glycol (PG/BG) is a common form of mineral oil and as such, is a petroleum derivative and is considered to be a PAH as highlighted above. But since it is so common in cosmetics and skin care products, I'm calling it out as a separate category. PG is so strong, it can take barnacles off a boat! EPA workers are required to protect their skin from contact because it penetrates so quickly and can cause brain, liver, and kidney abnormalities. When the EPA mandates workers use protective clothing, goggles and gloves and demands that excess solution be buried in the ground, it catches my attention! **If you see Propylene Glycol or Butylene Glycol on the label, definitely pass it by.**

Sulfates

Sodium Laureth Sulfate (SLES), and ammonium laureth sulfate (ALES) can create nitrosamines when combined with other ingredients. They are found in 90% of foaming and lathering products. Sodium lauryl sufate (SLS) and ammonium lauryl sulfate (ALS), are also used in cleaners, engine degreasers, and car wash products and can cause central nervous system disruptions, skin irritations, diarrhea, difficulty breathing, and eye damage. They are widely used in skin care products and are often advertised as coming from coconut.
Regardless of the form being laureth or lauryl all sulfates, SLES, SLS,

ALES, ALS, should be avoided.

FD&C Color Pigments

Color pigments are typically found in mascara, lipstick, blush, nail polish, shampoo, conditioner, and hair dye. We know not to eat color pigments and dyes in foods, but they are extremely common in cosmetics and toiletries. Anytime you see a dye or color pigment listed, it's an avoid. But when you see FD&C preceding the name of a color, it means that the dye is considered safe for drugs and cosmetics but not food. Since we already know we absorb more through the skin than through the stomach, and **animal studies have shown almost all FD&C colors to be carcinogenic, color pigments, but especially FD&C colors should be avoided as well.**

Fragrances

Unless you see an essential oil listed, which is pure fragrance and can have health benefits, most fragrances are synthetic and chemically derived. They can be comprised of thousands of separate ingredients many of which are toxic and carcinogenic. Phthalates, which are used to stabilize synthetic fragrances, are known endocrine disruptors and can impact the central nervous system and cause irritability, depression or hyperactivity. **Unless the label says phthalate free or lists only essential oils, if it has fragrance, it likely has phthalates**.

There are many more toxins and carcinogens to avoid: too many to cover in one chapter. But at least we have started the conversation and identified some chemicals you'll want to read your product labels to avoid.

Keep in mind that as adults, our tolerance for these chemicals varies by individual, but children as a rule with developing immune systems are much more vulnerable to these effects. If you were surprised to see petroleum jelly and mineral oil (common in baby oil) among the list, you'll want to pay special attention to ingredients you use on your children. Talc, the main ingredient in baby powder, is believed by many to be carcinogenic and has been tied to uterine cancer in women.

Talc is listed as potentially poisonous by the National Institute of Health (NIH) if

inhaled, and who hasn't breathed some in; it goes airborne pretty easily when you're applying it to a child! Virtually all of the common baby products contain ingredients I wouldn't want to ingest or absorb, let alone deliver to a tiny infant, but there are healthier versions and organic options out there including talc -free baby powder, which the NIH recommends.

A special note should be made regarding sunscreen and anti-perspirant. Most of us should be getting our vitamin D exposure (required for wellness) and should only need sunscreen for long full days outside. But if you decide to use sunscreen, it's even more important that you look for natural and organic versions.

Sunscreen commonly contains many of these listed toxic ingredients and others we didn't cover. Because you put it on your skin all over your body, using large amounts and re-applying, and then the heat of the sun opens your pores, enabling even more product to be absorbed directly into the blood stream, it poses a health risk if used regularly and not in a natural form. Especially, again, for your children whose immune systems are not fully developed. You can learn more about the connection between sunscreen and skin cancer in the next chapter.

And lastly, I also want to call out antiperspirants. Our bodies were designed to sweat and our armpits are a crucial part of our body's detoxification process. Stopping that process can pose health risks, as our bodies need to release impurities through our sweat. At the same time, if your antiperspirant contains aluminum, as most do, you should know that aluminum is designed to block your pores and stop them from sweating and it has been linked to Alzheimer's disease and breast cancer. A deodorant to control odor but allow the sweat process to continue as designed is fine, just don't block the pores. And please don't block them with a carcinogen like aluminum!

If you spend your hard-earned money to buy organic produce or grass fed beef, if you read the labels of the food you buy to make sure it doesn't contain harmful chemical additives, please read the labels of the products you absorb through your skin as they are just as important.

Here's a summary list of some of the common toxins found in different products. We haven't discussed all of these, but it's a great starting point.

Deodorants: Aluminum, Butane, Propane, Propylene Glycol, Talc, Fragrance.

Shampoos: Diethanolamine (DEA or TEA), Propylene Glycol, Sodium Lauryl Sulfate (SLS), Sodium Laureth Sulfate (SLES), Benzyl/Benzene Conditioners: Diethanolamine (DEA or TEA) Propylene Glycol, Fragrance.

Shower Bars/Gels: Bentoic/Benzyl, Diethanolamine (DEA or TEA), Sodium Lauryl Sulfate (SLS), Sodium Laureth Sulfate (SLES), Fragrance.

Bubble Bath: Sodium Lauryl Sulfate (SLS), Sodium Laureth Sulfate (SLES), Benzoic/Benzyl, Diethanolamine (DEA or TEA), Fragrance.

Shaving Gels/Creams: Diethanolamine (DEA or TEA), Propylene Glycol, Sodium Lauryl Sulfate (SLS), Sodium Laureth Sulfate (SLES), Fragrance.

Toothpastes: Fluoride, Sodium Fluoride, Sodium Lauryl Sulfate (SLS), Sodium Laureth Sulfate (SLES), Aluminium Oxide

Mouthwashes: Alcohol, Isopropyl Alcohol, Flavoring, Sodium, Lauryl Sulfate

Feminine Products & Color Cosmetics: Talc, Toluene, FD&C color pigments, Fragrance.

What You Need to Know About Sunscreen

Regardless of the season you are enjoying as you read this chapter, it is never the wrong time to talk about safely managing our sun exposure. While everyone agrees that getting a sunburn is not a good thing, both for your personal comfort as well as your longer term health and wellness, in our quest to avoid a sunburn we may unwittingly be doing more harm than good to our bodies. Recent studies have shown that many sunscreens contain an ingredient shown to actually cause – not prevent – skin cancer.

In addition, while many of us pay close attention to what we eat and try to avoid pesticides and other chemicals that may cause health issues over time, many sunscreens also contain other carcinogenic ingredients that are absorbed directly into the blood stream upon application, making their effect potentially greater than that of some of the residual chemicals on the food we consume.

And now research indicates that the most harmful and potentially fatal form of skin cancer, melanoma, is not caused by the sun. The truth is we need some sun exposure to produce vitamin D, a proven cancer preventor. So let's look at how we can safely get moderate sunshine exposure while avoiding sunburns and cancer-causing chemicals.

Why We Need Sun Exposure

If you read my previous chapter on vitamin D, you know how important I believe this group of hormones to be to our overall health. When I originally wrote about vitamin D, I said,

"While we have always known it helps with bone health as it facilitates calcium absorption, new research is proving that higher levels of the vitamin have an impact on immune health and protect against cancer, heart health, autoimmune

diseases, depression, periodontal disease, diabetes and a host of other conditions.

While adequate levels are shown to be protectors against many conditions, low levels, or deficiencies, are now linked to concerns with these same systems and conditions. Studies now show that vitamin D deficiency is rampant and far more pervasive than previously believed.

Many experts say increasing your vitamin D levels may be the single most important thing you can do to improve your health."

Those words are as true now as ever. More and more experts are lining up to tout the benefits of vitamin D to our overall health as well as for cancer prevention. While it is possible to get vitamin D from food, it is almost impossible to get all that we need on a daily basis solely from food sources. Without question, the best source of vitamin D is 20 minutes of direct sunlight (without sunscreen) daily.

In addition to vitamin D, direct sun exposure generates photoproducts that cannot be generated from food sources. When it comes to cancer prevention and overall health, vitamin D is essential and the sun is the best possible source.

But there are times when we want or need to be outside for longer periods of time than our skin can handle without burning and no one wants a sunburn. (Early childhood sunburns have been linked to skin cancer development later on.) Hence, the multi-billion dollar, largely unregulated, sunscreen business. But let's look at why sunscreens are not the answer.

Sunscreen and Cancer

Headlines were made earlier last summer when a study revealed that products containing vitamin A or its derivates are shown to increase the rate at which malignant cells develop and spread skin cancer. Sadly, almost half of the most popular sunscreens available today contain these ingredients, and it was

reported that the FDA has known of the potential danger for a much as a decade now.

Vitamin A is a popular sunscreen ingredient because it's an anti-oxidant that can slow aging. However, anyone who has been given a prescription based form of vitamin A for acne or youthfulness knows that it comes with an advisory to avoid sun exposure. Vitamin A has photocarcinogenic properties, which means that it can become cancerous through exposure to light.

The FDA studied the impact of vitamin A and found that tumors and lesions developed 21% sooner in vitamin A-laced cream than in creams not formulated with vitamin A. Since 41% of sunscreens contain vitamin A or its derivatives (retinyl palmitate or retinol) this is a significant concern for the sunscreen industry.

But beyond vitamin A, there are a number of other ingredients that cause concern, especially since sunscreen is applied to skin and then in the heat, skin pores open and rapidly absorb the chemicals directly into the bloodstream. Unfortunately, the list of these common skin care carcinogens is too lengthy for this article so I will have to share that with you in another issue. For now I will just say that should you decide to use sunscreen, please choose an organic brand that minimizes exposure to carcinogenic and endocrine disrupting chemicals such as parabens, nitrosamines, propalene glycol, and sulfates.

Is exposure to all these chemicals really worth it? Taking the risk of exposure to all these cancer-causing chemicals might be worthwhile if doing so truly prevented potentially fatal skin cancer. Let's put it all in perspective. Assume for a moment that using sunscreen prevents melanoma, which we will see in a moment is not the case. (If sunscreen is the answer, then why has melanoma doubled over the past 20 years despite the introduction of sunscreen in the late 1960s? And why are melanoma rates higher among sunscreen users than non-users?)

Even if sunscreen did prevent melanoma, that benefit has to be weighed against the risks derived from lack of sun exposure.

Vitamin D and its photoproducts produced through sun exposure are proven to help prevent breast, colon and prostate cancer. (Using sunscreen inhibits vitamin D production and prevents those benefits.) About 40,000 people died from breast cancer, 32,000 from prostate cancer, and 51,000 from colon cancer. All together that's about 123,000 deaths a year from cancers that are directly connected to a lack of sun exposure. Last year, 8,700 people died from melanoma. Seeing those statistics one must wonder if our fear is unjustified and doing more harm than good.

But now on to the bigger question: does sunscreen prevent melanoma? For those with higher risks due to having fair skin or a family history of skin cancer, it may be worth exposure to all the concerns we've looked at thusfar if using sunscreen could truly prevent melanoma.

To date, no research has proven that sunscreen can prevent melanoma. While sunscreen may help prevent some easily treatable generally non-fatal skin cancers, no ties have been made to melanoma prevention. In fact, according to the Food and Drug Administration, "The FDA is not aware of any data demonstrating that sunscreen use alone helps prevent skin cancer" of any kind. The International Agency for Research on Cancer agrees.

Experts generally take the stand of we don't know, but meanwhile you should keep using it. (Friends of mine in the medical field say that they feel compelled to encourage sunscreen use despite lack of evidence supporting it for fear of lawsuits.) But should we keep using something that doesn't protect us from cancer when we know it increases health concerns and risk of other forms of cancer through its use?

The Diet Connection: Melanoma and Omega 3

If sunscreen doesn't prevent melanoma perhaps that is because it is not the sun that causes melanoma after all.

For some time it was thought that the sun was the source of the problem and that it was excess sun exposure that would lead to melanoma. That link is now being questioned. One recent study showed that people working exclusively inside had higher rates of melanoma than those whose jobs required them to be both inside and outside. Another study indicates that melanoma occurs more often on the

soles of the feet than on the hands, even though it's clear that hands would have significantly more exposure to the sun than the bottom of the feet. And melanoma is more common in northern latitudes than in southern regions where there is greater sun exposure.

There are some researchers currently trying to make a connection to chlorine exposure and melanoma. They believe that chlorine contact with our skin due to drinking and bathing in chlorine-treated water as well as swimming in chlorinated pools may be the cause. Studies in Belgium have connected fatal melanoma to the consumption of chlorinated water. It's not a leap to me to connect cancer to contact with a chemical substance, and while research continues on this theory, so we don't know for sure yet, it is an interesting one.

(It would certainly explain help explain how melanoma gets on the bottom of feet, since standing in a shower or pool repeatedly over time would enable chemical absorption directly into the blood stream. As discussed in the chapter on chemicals in our personal care products, twice as much is absorbed through the skin than through the digestive tract.)

Though perhaps the sun may have a supporting role (in exascerbating the chlorine impacts for example), one thing is clear, the sun is not the sole culprit. Until we not only know but have an effective way to avoid the true cause, our best defense is prevention. The key to preventing melanoma, it turns out, is directly related to diet.

In 2001, the National Academy of Sciences published a study indicating that omega 3:6 ratios were the key to preventing skin cancer. As I shared in a prior chapter on omega 3, it is not that omega 6 is bad; we need both omega 3 and omega 6 to be healthy. The problem is that historically we have had a 1;1 balance of omega 6:3. With the advent of vegetable oils such as corn oil, canola, sunflower, sesame, and safflower oils, we've gone from very little vegetable fat to consuming more than 70 pounds a year.

These oils are pervasive in processed food today, and our omega 6:3 balance has shifted to more like 20 or 50 to 1; it is no longer evenly balanced. It is this imbalance that scientists believe creates the problem. A prestigious cancer

journal reported that excess omega 6 can lead to the proliferation of cancerous cells, including melanoma, while long chain omega 3 fatty acids act as inhibitors to that growth.

An Australian study showed that simply by eating fish rich in omega 3, without changing anything else in the diet to reduce omega 6, resulted in a 40% reduction in melanoma.

In addition, studies have shown that people who eat more omega 3s are able to increase their burn threshold. This allows them to enjoy healthy sun exposure for longer periods of time without risk of burning or developing skin cancer. Another great reason to balance omega 3s!

Safe and Healthy Vitamin D Exposure

Most everyone agrees that while we need moderate sun exposure, the key is to avoid burning. Burning has been connected to skin cancer and logically, burning is the natural way of letting our body knows that we have had enough sun.

Get your sun exposure earlier or later in the day when the UV rays are less likely to cause burning. Build up your sun exposure slowly over time so that gradually you can spend more time in the sunshine before you are at risk for burning.

Seek shade midday and use hats and clothing to protect you. (I am not a fan of sunscreen- laced clothing as the chemicals that are used to provide the sun barrier are present on the clothes and can be absorbed by the skin when you sweat.)

Avoid sunscreen use whenever possible. But for those times when you must go outside for longer than would be safe for you to avoid a burn, seek a natural organic sunscreen without retinol palmitate or retinol and without parabens and other carcinogens. Badger makes a good one that you can find in a health food store or on amazon.

And perhaps most importantly of all, whether you choose to use sunscreen or not, examine your diet with a goal of omega 6 consumption and trying to balance the omega 3:6 ratio in your diet. Eat more fish and consider taking a high quality omega 3 supplement daily, or preferably with every meal. And try additional supplementation before a longer day in the sun.

At a minimum, it will make your body healthier overall and it may well prevent skin and other cancers. But it can also improve your sun tolerance and reduce your burn risk, both short and longer-term. And with the ozone depletion in today's environment, that's something we can all benefit from.

Resolve to be Successful: Making Change Last

Each New Year, we get excited, motivated and inspired to make some positive changes in our lives. We are ready to lose weight, eat better, get healthier or whatever our heart desires.

So we join a gym and after not having worked out regularly, we struggle through an hour-long class. We let the trainer walk us through all the machines to show us how they work and we overload every muscle group in our body at once. Exhausted and achy we return home, sore for days. The memory of the discomfort takes hold and we never go back.

While we often want an instant change, the reality is that we didn't gain the weight overnight, and we didn't lose our fitness levels in a week or a month. These changes occurred slowly over time based on a series of decisions: an extra serving at dinner, a stop at a fast food restaurant, the elevator instead of the stairs … all the little choices we made over the course of many days, weeks and months led us to where we are now.

If I were to ask you right now to tell me three things you could do to be healthier, I have no doubt you could name three with little thought. Perhaps you'd say I could drink more water or get more sleep, eat more vegetables, or go for a walk every day. Most people already know some of the things they could or "should" be doing to live a healthier life.

If we know what to do, or at least how to start down the path to wellness, why don't we do it? What holds us back? Yes, life is busy! But we schedule and keep appointments for oil changes and dentist appointments, car pools and ballet lessons. Why can't we find a few brief moments a day to schedule in our own health? In this final chapter, I am going to share some tips on making lasting change in your life. If you are serious about doing things differently and need some help following through, these steps can help you get to where you want to

go.

Start with Small Steps

Perhaps it feels too big to take on such change in the context of our chaotic lives. Then again, the little steps can get lost in the space in between our bigger priorities. While we know it's important, some of us have not yet learned to put the oxygen mask on ourselves before we try to save others.

Women especially can fall into the trap of making sure everyone else is taken care of before taking any time for themselves. Sadly, it can sometimes take the big thunk on the head of a looming illness before we listen to the whispers that have been echoing in our head for weeks, months, even years …

With the best of intentions, we commit to resolutions to make things better, only to find ourselves overwhelmed or exhausted and falling back into the same comfortable routines again. And therein lies the challenge: routines are not created instantly. Undoing those patterns does not happen over night; it takes time, commitment and support to do things differently.

It's not easy to leave our comfort zones. So I'd like to share with you some coaching tips that can be used to create and sustain manageable change over time. With some help, you can finally succeed in making those resolutions stick!

Tips to Sustaining Change

The best way to start is to be very clear about what it is you want to achieve. Ask yourself: what is my goal and what do I want to accomplish? Is it losing weight or is it getting healthier? Is it vanquishing stress or living a simpler more relaxed lifestyle? The clearer you can be about your goals, the more likely you are to reach them. Write them down: Putting your thoughts on paper makes it more powerful and more real.

Next focus on what accomplishing that goal would bring to you. How would it help? Why is it important? Identify the benefits you will receive if you are successful. Will it enable you to dance with your daughter at her wedding? Or be around to see your first grandchild? Look fantastic at your reunion? Focus on the

outcome. Then take some time and try to connect to your goal emotionally.

Begin by zeroing in on the negative aspects of not reaching your goal. If you don't lower your cholesterol, or rid yourself of the pre-diabetes, are serious medications in your future? Is your inability to be as physically active as you would like holding you back from enjoying some aspects of your life? Close your eyes for a moment and really feel the pain or experience the limitations that not meeting your goal might cause. That will fuel your motivation.

Now leave that behind and imagine what you would feel like if you accomplished your goal. How awesome would it feel to beat that condition without being on powerful medications with unpleasant side effects? To finish a 10K running race or even just a dance class with your partner? Spend some time envisioning a successful outcome. Really feel what living your life would be like without the pain or limitation that existed formerly and with all of the joy that would come from your success.

Next we need to consider what obstacles might be standing in your way. Are you blocking this? Is it your busy life, your family, your work? Identify every barrier that might exist. Write the barriers down and then when your list is complete, go back over it and come up with at least one strategy for overcoming each barrier. If you need help, ask someone to brainstorm with you. Could you bring lunch to work, schedule your workout like a dentist appointment that can't be changed, or ask your spouse to do the dishes while you do an exercise video? How could you succeed in spite of that barrier?

Managing Goals and Being Accountable

Now take each goal and break it into specific steps that you could accomplish in one week. You might decide to increase your water consumption from one glass a day to two or to drink a glass before sitting down to eat every meal; to start eating breakfast; or to eat three servings of green vegetables this week. Be specific, but create steps that you know you can reasonably accomplish. The feeling of success is powerful and that feeling will drive you forward.

Choose steps that feel easy to take on in your life as it is, and/or bring you joy. Combine work with pleasure where you can. Enlist a work out buddy and make

workouts social. Try something you've always wanted to learn, or revisit a childhood passion you have let go. Think small and manageable.

Then focus on how you'll be accountable. Consider how someone who doesn't see you every day would know where you are in your progress. Make a chart and put stars in the column like you did for your kids when they did their chores. Schedule a weekly phone call with a friend or a sit down with your partner where you have to share your progress and say out loud what you did or didn't do that week. Find the best way to hold yourself accountable to your goals.

Lastly, think about who in your life can support you on your journey. Find the person or people you can call when you need support, encouragement, or motivation; the ones who will always cheer you on. We are much more likely to succeed with support and when we are held accountable. So apply some of your work lessons to your own personal challenges. You may have heard the saying at work that what you don't measure doesn't get done. It's true in life as well so measure your progress. And remember **TEAM: Together Everyone Accomplishes More**. Enlist a support team to help you stay on track.

You may also need to ask yourself if there is anyone in your life that might possibly sabotage you or not support you completely. If you know of any, come up with a way to get them on your side. If someone is frustrated with his or her own weight, they might—consciously or unconsciously—sabotage you because your success may make them feel as though they have failed. Telling someone that you need to change your diet because your doctor says your health is in danger is going to elicit a different response than telling that person you are on a diet to lose 20 pounds.

Each week as you accomplish your mini goals, revisit your list and then create new goals. If you don't meet a goal, don't berate yourself. Ask yourself if it was too big a goal, and if so, break it into something smaller. If not, tackle it again the next week. Take little steps every day and revisit your progress every week. Reconnect with the emotions you explored earlier in the process when you need some inspiration.

If you stick with it, you'll be amazed at how far those little steps can take you. Before it's

once again time to raise a toast to resolutions, you will really be looking in the glass at a healthier, happier you!