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INFLAMMATION

SILENT BUT DEADLY

Why Inflammation Kills Millions And How To Eliminate It

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INFLAMMATION

/ˌinflˈmāSH(ə)n/

There are many diseases but only one health.
And many diseases start with inflammation.

Let food be thy medicine and medicine be thy food. - Hippocrates: 2300 years ago.

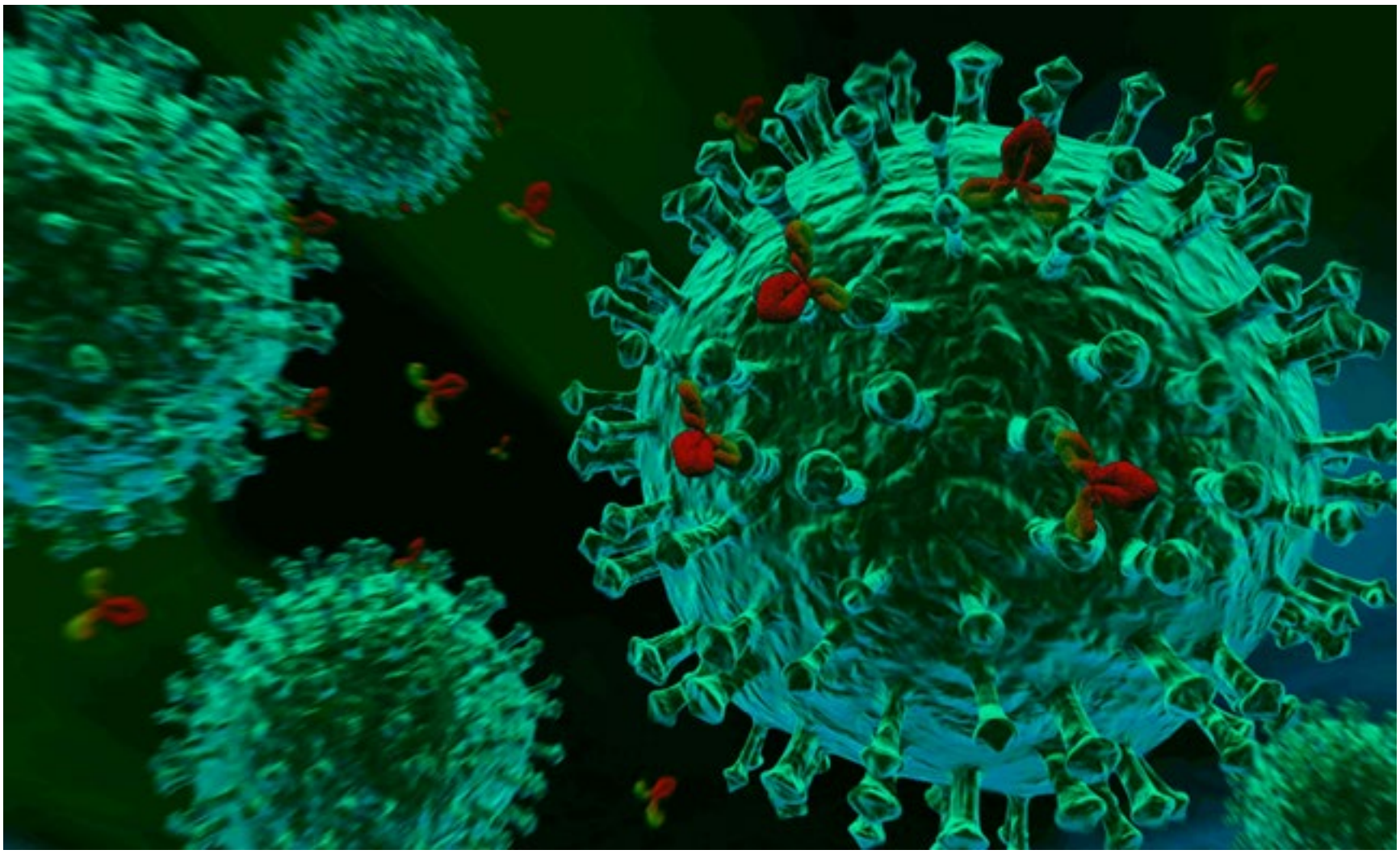
Do you want to know what could be silently damaging your health without you being aware of it?

Do you know how common this is and how it affects most of us?

Do you want to know what is the root cause of most diseases, illnesses, and medical conditions?

Are you sick and tired of being tired and run down? Do you want to feel better, feel more energetic and renewed? No, I am not selling or trying to convince you to take a new vitamin or supplement or drink. I am going to help you understand what could be causing your problem and how to get rid of inflammation.

Read on…



All of us have an immune system. It is kind of like the Armed Forces that protects and defends our country: every human has one too called the immune system and it is divided into two parts: the barrier system and the internal system. The barrier system is our skin that protects us from the outside world: you can wash off things that get on it. Another barrier is all our mucous membranes that line the nasal passages, the respiratory passages, and the urinary and genital tract; and the natural tearing of the eyes wipes off anything from your eyes. Mucous for example keeps many microorganisms from penetrating into the underlying tissues, as in your nasal passages: when you sneeze, you are getting rid of something that is an irritant or trying to invade the nasal tissues. The lining of the stomach secretes a very potent acid known as hydrochloric acid: it is strong enough to kill many microbes. This is all part of the barrier system. The internal system is more complex and cannot be seen, and I am going to explain it to you and show you not only how important it is, but also what happens when it is overwhelmed or goes out of kilter.

The immune system is unique and different for every person, just like a fingerprint. What does it do? If you want to boil it down to basics it has one job: to tell self from non-self; in other words to be able to tell what is normally and naturally of your body and what is not normally from your body. It instantly recognizes all your own cells, organs, anything that makes up your whole body. Everything else is what the immune system doesn't recognize, is considered foreign and it will be attacked. Of course, it is really much more complicated than that: it is one of the body's most complex systems, but I am going to describe the important points to you that will help you understand it and how it works.

An important point I want to make here is that the immune system has to stay in shape just like we do. Whose immune system do you think will be stronger and more able to fight off infections and toxins? The person that pays attention to their diet and does some exercising or the person who sits on a couch playing video games or watching TV while eating pizza or potato chips? The answer is obvious: we all know if we should be eating better or doing more than sitting around.

What the immune system considers foreign is anything from the outside: this includes viruses, bacteria, molds, chemicals, whether you breathe them in, like diesel fumes or the artificial scent from plug-in air fresheners, whether you put it on your skin, like creams and lotions with artificial chemicals, whether they are in what you drink, like artificial sweeteners, and whether they are in what you eat, like artificial colorings or bacteria in undercooked meats, and many, many others. So what does the immune system do when it encounters something it doesn't recognize, something from the outside, something foreign? It creates **INFLAMMATION**! This is what we are going to really get into…read on!

- Illnesses due to inflammation are the most common causes for hospitalizations.

- Arthritis, or inflammation of joints, affects one third of adults and is the number one cause of chronic pain in Americans.

- The number one cause of disabilities in the United States is from inflammatory diseases.

- The number one cause of premature aging is inflammatory diseases.

Inflammation is the normal way our immune system reacts to an invasion that causes or can cause injury and damage to the body. The word inflammation comes from the Latin *inflammare*: to set on fire. Inflammation is absolutely vital to the body: it is how it defends itself against a foreign invader, like viruses, bacteria, chemicals, and toxins, and then repairs the damaged tissues, helping the healing process. Think of what would happen if you didn't have an immune system protecting you with inflammation. Your wounds would fester, you would get very ill quickly, and just about any infection would be deadly. The cells of the immune system communicate and cooperate with each other in a very complex way. Think of billions of microscopic soldiers always on the ready throughout your body. The soldiers in charge of communicating with other units are called cytokines; they move around and send emails and text messages if they encounter an invasion going on: "come and help fight this off". These communication cytokines let all the different types of cells involved in inflammation know they are needed.

THERE ARE 2 TYPES OF INFLAMMATION: ACUTE AND CHRONIC.

ACUTE INFLAMMATION

Whether you twisted your ankle, cut your finger accidentally in the kitchen, got a splinter in your finger, catch a virus or a cold, get an infection, or any number of things, all of these are acute. Acute means it starts suddenly, abruptly. Acute often also means an illness that is of short duration, that progresses rapidly, and then ends. If you have an acute sore throat, it will last only a few days; if you have an acute myocardial infarction, in other words a heart attack, it will last about a week. **Acute inflammation** is the immune system's reaction to isolate and disable whatever got into your body and caused the inflammation. What do you feel when this happens? What are the symptoms? Actually, you have experienced this during your lifetime: the area becomes painful, swollen, red, hot, and can't function normally. If it is your sprained ankle, it swells up and you can't walk much less run; if it's a cut in your finger, you stop using the finger because it gets red, swollen, and it hurts, and the same goes for a splinter.

Acute inflammation starts within minutes of an attack, usually triggered by an infection (bacteria, viruses, etc) or by exposure to toxins (mostly chemicals), or by physical damage (sprains, falls, cuts). The main purpose of acute inflammation is to kill invading microbes, to prevent them from spreading, then to restore the area back to normal and heal the area. This happens rapidly and then settles down. Let me first take you briefly through acute inflammation, and you will see that you are familiar with some of it.

What happens at the site of injury is this: you have white blood cells called neutrophils that are the first to arrive at the site. They come there because the local cells sent out an alarm when they sensed a foreign substance. Your bone marrow makes more than 100 billion neutrophils a day and during an **acute inflammation**, it will produce 10 times that. Neutrophils move around very fast and release chemicals to kill any microorganism (bacteria, viruses, etc.) that can cause diseases. Neutrophils also release proteins called cytokines and depending of what kind of cytokine it is, one of them causes you to feel pain: this is to make you stop what you are doing. Cytokines also dilate blood vessels in the area allowing other cells and nutrients to squeeze through these now dilated blood vessels to help in the killing of microorganisms and then the healing process. The dilated blood vessels are what make the area red and swollen. Neutrophils then send messages –this is via the cytokines- to the rest of the immune system to let it know that there is a problem going on and to help manage the inflammation. When the healing process starts, messages go out to other cells to clean up the area of dead cells and other debris, and end the inflammation.

What acute inflammation does is it prevents something that got into your body from spreading, invading other organs and damaging them, which would eventually lead to very serious consequences and even possibly to death. Another important point is that when you have an injury without the invasion of microorganisms like an ankle sprain, acute inflammation brings in the same cells and these start repairing the damaged tissues while protecting the area from any microorganisms that may invade and interfere with the process. The ligaments of the ankle hold the ankle bones and joint in position. They protect the ankle joint from abnormal movements-especially twisting, turning, and rolling of the foot. A sprain is when you stretch these ligaments beyond what their normal range and there may even be small tears. These immune cells help bring in the necessary substances to start to repair the tear in these ligaments. Any scars on your skin are the work of the immune system bringing the tissues back to normal and closing up wounds. In a very general way, this is how **acute inflammation** works. It is essential to the body and for life.

How does the immune system recognize whether something is harmful or not? How does the immune system know if it is friend or foe?

How does our immune system know if a foreign substance is a bacteria or virus? How does it know if this substance is a chemical? Bacteria and viruses have cells walls, or to say this differently, they have an outside envelope made up of proteins, and proteins are made up of amino acids. Imagine a brick home: the walls are the proteins and the bricks are the amino acids. Our cell walls are made up of proteins too, so if the immune system doesn't recognize the protein of outside wall, it must mean that this is foreign and must be attacked, killed, and gotten rid of. Remember in the beginning, I wrote that the immune system has only one job if you boil it down to the minimum: to tell self from non-self; in other words to be able to tell what is normally and naturally of your body and what is not normally from your body. It instantly recognizes all your own cells, organs, anything that makes up your whole body. Everything else that the immune system doesn't recognize is considered foreign and will be attacked with **inflammation**.

Let's look at this in a different way. Say you live with your family in a house: mom, dad, (you are either mom or dad) and the kids. Someone rings the doorbell, you open the door and you don't know the person standing there, you don't recognize him or her. It doesn't matter if they are male or female, tall or short, skinny or chubby, old or young, or whatever, you just don't recognize them. This is the same way the immune system reacts: if it doesn't recognize the protein (the person standing there), it is going to go ahead and take for granted that it is not of the body, that it is a foe and needs to be gotten rid of. This is when inflammation starts.

What about non-living things, like chemicals, toxins, or other substances? They do not have an envelop of protein. So how does the immune system recognize these? Here it is different: the damage toxins, chemicals, etc. do to cells causes them to die and break apart. Immune cells will recognize that there are pieces of cells lying around that should not be there, and this will prompt an inflammatory reaction. Why? Pieces of dead cells are not the norm. It is not what normally and naturally occurs inside the human body. The immune system makes sure that all is in order and all is protected. When there is a bunch of debris that tells the immune system that something is killing off cells, and they will go into action with inflammation. We will get into a lot more detail about this, as it is the vital connection to chronic infection.

Let's take an actual medical situation: acute appendicitis. Here I will get down into the details of the cells and molecules involved in inflammation.

ACUTE APPENDICITIS

Most of us have heard of and probably even know of someone who suffered from acute appendicitis, a sudden inflammation of the appendix. So what is the appendix? It is a small finger shaped pouch that stick out from the colon, the large intestine. As it happens, appendicitis is the most common medical emergency in the United States, and more than 300,000 appendectomies (surgical removal of the appendix) are performed every year, usually in people between the ages of 10 to 30, generally more in men, although it can happen at any age. If it is left untreated without surgery and antibiotics, it can be fatal with more than 50% of patients dying; about 400 people die every year from this.

There is one basic cause that leads to an acute appendicitis: something blocks the opening of the appendix from the colon. If there is an infection of the gastrointestinal tract (most doctors call it the GI tract for short), the resulting swelling around the opening can block it up. Sometimes trauma can cause swelling with resulting obstruction. Blockage of the opening can also be due to a foreign object that was swallowed, like a piece of metal, a small button, or other items (you would not believe what people accidentally or purposely swallow!); or hard stools where a piece of fecal material (what I mean here is poop) gets stuck there; or some types of parasites can block the opening, but this last one is rare. When the opening is blocked, it leads to increased pressure inside the appendix, decreased blood flow, and an overgrowth of bacteria inside the appendix, all of which cause acute inflammation (I'll explain how this happens in more detail further on down).

Acute appendicitis usually starts slowly then builds up quickly: first a bit of general pain or discomfort in the area around the belly button; this pain becomes stronger and stronger and then settles down in the right lower part of the abdomen. Once there, the pain becomes sharp

and constant, and any movement or coughing or sneezing makes it much, much worse. There is also fever, nausea, loss of appetite and constipation with fever. Sometimes acute appendicitis happens over a few hours, sometimes it stretches over a day or two, and no one knows why.

How is acute appendicitis diagnosed? There are several conditions that can mimic acute appendicitis so the doctor has to be thorough, conducting an examination of the abdomen, by palpating and auscultating the abdomen with a stethoscope. This is an expertise that requires considerable clinical experience, a very good stethoscope, and excellent listening skills. Usually, a blood test to check the level of white blood cells will be done: when these are high, it indicates an infection. A urine test (urinalysis) will also be checked to rule out either a urinary tract infection or a kidney stone, both of which can at times imitate the same symptoms as an acute appendicitis. Sometimes it is necessary to include a CT (computed tomography) scan or an ultrasound, but this is not always necessary. When the patient is a child or a pregnant woman, an MRI is sometimes done to not have any radiation, which can be harmful to children or the developing fetus.

The person with acute appendicitis usually ends up at the hospital and has their appendix removed with either an incision in the right lower abdomen or via laparoscope, either one done under anesthesia. The incision surgery is the procedure of choice if the doctor thinks your appendix has burst open. Otherwise the surgery is done via laparoscopy, where the surgeon makes several small incisions to pass tubes through. He will use a tube to inflate the inside of the abdomen so he can look around more clearly and then use a special tube–like laparoscope that shows what is inside on a screen; he can then use another instrument to remove the inflamed appendix and suture it up. This procedure is shorter, with less pain after the surgery and the patient can go home in a couple of days. Full recovery is usually a month. Less than 1% of patients who undergo laparoscopic surgery die.

If the appendix swells up to the point were it bursts open, bacteria can spread into the abdomen and now it becomes a surgical emergency because it is a life-threatening condition called peritonitis, which is an infection of the inside lining of the abdomen. A surgical operation is done right away to have the appendix removed, cleaning up as much of the abdominal cavity from pus, putting tubes in the abdomen so that the pus can drain to the outside. The tubes are called drains, and they will remain in place for several days until the infection inside the abdomen has cleared up before they are removed. Antibiotics are started via intravenous route, and the person remains in the hospital for several days and recuperation can take up to two months.

What really happened inside the belly? What goes on at the site of the acute appendicitis? Let's get into the details of what molecules and cells do when this happens.

Acute inflammation starts with the local immune cells. These cells include neutrophils, macrophages, and mast cells. Certain molecules inside your body play an important role in inflammation. There are molecules called lipopolysaccharides (a very long word abbreviated to LPS), also known as endotoxins. LPS is found on the surface of most bacteria, and when the immune system notices this, it is like a waving flag to the immune system that there are bacteria invading the area. Your immune cells have on their surface a protein called toll-like receptors (TLRs) that recognize LPS as bad for you and send out an alarm that there is an invasion, setting off the immune response, and this response is inflammation. Inflammation is the immune systems response to injury and infection.

Inflammation starts with neutrophils, one of the most important and amazing cells of inflammation. These are white blood cells that roam throughout the body, live for a few days, and then die (more on this later on). Neutrophils are the first to start the inflammation at the site of invasion. Your bone marrow makes about a billion of these a day and will increase production by 10 times during an acute inflammation! These cells will swallow up the bacteria; they also kill microbes by "spitting out" molecules that are poisonous to bacteria. These molecules that are toxic to bacteria are stored inside little bubbles or sacs inside neutrophils. These poisons are actually enzymes that break down the cell walls of bacteria, effectively destroying them. Macrophages (remember: large eaters) start engulfing these bacteria and send out a small proteins called cytokines. These are messengers to the rest of the immune system, letting it know that there is an invasion going on. It is like sending out emails, alerting the system. Mast cells, another type of white blood cell, then arrive at the scene. They contain heparin, a substance that prevents blood from clotting so cells can move around, and histamine. Mast cells release heparin when there are bacteria and LPS in the area. They release histamine, when stimulated by an allergen (a substance that causes allergies), which is why people take an antihistamine to decrease the symptoms. Here, with LPS on the walls of bacteria, they only release heparin, and save the histamine for allergies.

With acute appendicitis, there is decreased blood flow to the area, so less immune cells can get to there to fight off the infection. The infection then continues to increase, and the way to resolve it is by removing the inflamed appendix and giving antibiotics before it bursts open. If it does burst open, then the surgeon will make an incision, remove the appendix, and clean out the area leaving drains as discussed above.

Acute appendicitis is one example of acute inflammation. When the immune system is overwhelmed by invaders, the invasion will spread to other areas, and this now becomes life threatening if not treated quickly and effectively with the right antibiotics. Even then, it sometimes may be too late, as more and more bacteria are becoming resistant to antibiotics.

*The real danger is in **chronic inflammation.***

The immune system is responsible for an amazingly complex task. This task is to recognize and ignore all the cells and tissues within our body and not only this, but also at the same time to attack all invaders: bacteria, viruses, foreign cells, and fungi (molds). This incredible and wonderfully complex immune system regularly and successfully protects our body by recognizing and eliminating billions of different types of infections that our bodies come into contact with. Normally, this remarkable system immediately recognizes any microbes that have entered our body and starts a very strong attack on the invaders. We only suffer for a few days when we get a cold.

Over the last few decades, something has been driving and pushing this system over the edge. Something has been causing it to work all the time because of a continuous invasion, a constant non-stop attack to the body itself. These are environmental toxins and chemicals to which we are all constantly exposed. Have these exposures increased over time? The answer is clearly YES. One example comes from a 2009 study conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics. It is called the National Health and Nutrition Examination Survey (NHANES). The blood and urine samples of 2,500 Americans were tested for chemicals, including industrial compounds, PCB insecticides, mercury, BPA (bisphenol-A), the gasoline additive MTBE, triclosan – found in antibacterial soaps, several herbicides, and pollutants. None of the volunteers had any industrial, occupational, or residential risks for these exposures, had detectable levels of 212 chemicals. Ordinary people living normal lives have numerous toxins in their bodies from environmental exposures. An earlier study conducted in 2005, scientists found 287 industrial chemicals in the cord blood of ten newborn babies from around the country. These chemicals were transmitted from the mother to the baby during pregnancy, and included the breakdown chemicals of Teflon, pesticides, phthalates, flame-retardants, and dioxin. As a side comment, the chemical industry is doing just fine, growing at an annual rate of 3.5%, and doubling in size every 20 years.

This shows us that we are constantly exposed to chemicals, and as described before, these cause an immune reaction, and the immune reaction is inflammation. Since the exposure is continuous, the inflammation is also continuous, resulting in chronic inflammation.

We have known how acute inflammation works for many decades. However, new discoveries have shown that chronic and often-called silent inflammation is the most important factor in the increase of diseases that affect so many Americans. The reason it is also called silent is because it is not immediately felt: it can grow and grow silently over years until chronic illnesses set in. Recent medical and scientific research has shown chronic inflammation to be a major factor in the development of degenerative diseases and loss of youthful functions.

How did this new information come about? What did these new discoveries show us? Here is how some of it happened: about 40 or so years ago, doctors began to notice a serious increase of chronic diseases that were somewhat uncommon before, such as heart disease, stroke, cancer, diabetes, obesity, and arthritis. These are among the most common, costly, and preventable of all health problems. Let me give you an example by telling you about autoimmune diseases: they affect about 53 million Americans, and are more commonly found in women. They are one of the top 10 leading causes of death in female children and women of all age groups. Among these autoimmune disorders is multiple sclerosis, commonly called MS, one of the most frequent and severe neurological diseases, mainly affecting young people, eventually causing them to become completely disabled it the part of their lives when they should be the most active and productive. MS robs them of so much. Another example of autoimmune diseases is type 1 diabetes, usually found in children and adolescents. Between 2001 and 2009, this disease alone increased by 23% according to The American Diabetes Association. Autoimmune diseases affect all parts of the body, from the brain as in MS, skin as in psoriasis, joints as in rheumatoid arthritis, the gut as in celiac disease, v and ulcerative colitis, and hormones, as in diabetes and thyroid disease, and many more. Doctors and scientist looked at what could be causing the increase in these diseases, and the majority of studies pointed the

finger at environmental causes, rather than genetics being the cause. As medical and scientific knowledge developed about environmental chemicals and toxins, and some infections, we came to realize that the root cause was chronic inflammation.

How do these environmental causes bring on inflammation? Remember how I told you that the immune system recognizes all our own cells and tissues and leaves them alone, but anything it doesn't recognize it is going to attack? An attack by the immune system is by inflammation. As you are living your daily life, you are exposed to chemicals every time you walk down the detergent aisle at the supermarket. You are inhaling all those scents, which are all chemicals, into your lungs. The same happens when you do your laundry with scented soaps and fabric softeners. These chemicals go to your lungs. Some of these chemicals we breathe in, some get on our skin and get absorbed that way, and some are in what we eat and drink and end up inside our gastrointestinal tract. But wherever they end up, the immune system is primed to attack them, as they don't belong in the body.

What scientist and doctors did is they realized that all this increase in chemicals has caused an increase in inflammation and thereby an increase in inflammatory diseases.

CHRONIC INFLAMMATION

Chronic inflammation is what happens when inflammation is prolonged due to continued exposure to environmental factors, such as chemicals and toxins. It causes damage to organs, which results in diseases, disorders, and chronic medical conditions. This is simplifying a very multifaceted event that includes biochemical, molecular, and cellular components and proteins. In the past, we did not connect the dots between **chronic inflammation** and these diseases. It is more recently that medicine and science began seeing the connection, as explained above, and numerous studies have been published to help clarify how this happens.

Imagine a strong rainstorm in your area that after a few hours moves on. Lots of rain fell, some areas may have temporarily flooded, there are small branches and twigs on the streets and in yards, and then the sun comes out and starts to shine. The rainwater eventually drains away, the branches and twigs are cleared up, and all is back to normal. The dust has been washed away from streets, sidewalks, cars, truck, buses, etc, and everything is cleaner. All even smells different. Now imagine this storm going on and on, not letting up for months and months, year after year. There is flooding all over, cars can't get around, crops are ruined, fruits trees are damaged, roofs leak, and everything and everyone is negatively affected. The rainstorm is like chronic inflammation: it continues on for years until it results in a chronic disease or in chronic diseases. You can develop more that one chronic disease: for example, there are many Americans suffering from diabetes, high blood pressure and heart disease, along with arthritis.

Chronic diseases affect about ½ of the adult American population. Chronic diseases cause 7 out of every 10 deaths in the United States, killing more than 1.7 million people.

Certain medical centers are advocating we call chronic diseases "Chronic Inflammatory Diseases" as so many have their root cause as inflammation.

What brings **chronic inflammation** on, what are the factors that trigger it? **Chronic inflammation** can be triggered by exposure to chemicals, chemicals in foods and beverages, eating excessive calories, eating the wrong foods, and high blood sugar levels. For all of you who have a sweet tooth, sugar is not normally found in the body, it is not a natural substance, it is man-made, at a factory, and the immune system doesn't care if it's called Saccharin or Equal or Splenda or Domino. It won't recognize any of them. Sugar became available in the mid-1700's; up to then, if anyone wanted something sweet, they used honey, and they did that all the way back to Adam and Eve. It's only in the last 250 years that sugar started being used more and more in beverages and in foods. The fact of the matter is we are regularly and relentlessly exposed on a daily basis to chemicals and processed foods full of calories and chemicals and sugars. More on sugar later on…

It is now clear in science and medicine

that the destructive capacity of c**hronic inflammation** is enormous and powerful. The danger of **chronic inflammation** is that it is frequently silent, yet is slowly but surely destroying a person's health. **Chronic inflammation could be threatening your health at this very moment, without you realizing it.** A Harvard study published in March 2016 showed how inflammation is not only the cause of cardiovascular diseases, but also diseases of the nervous system, the spleen, and bone marrow. There are over 181,000 medical journal articles published about how chronic inflammation causes diseases throughout our bodies. I don't think you want me to go over them with you, and if you are interested, you can go the National Library of Medicine, which is part of the National Institutes of Health, and look them all up. The website is: **Pubmed.gov.** While you are on that website, you can put in the question box 'inflammation' and ask 'inflammation and diabetes' (22,481 studies) or 'inflammation and cardiovascular diseases' (66,468 studies) or anything else you would like and all those studies will appear on your computer screen. You can also type into the box 'Campbell AW' and a list of studies I have published over the last 25 years will come up.

Can chronic inflammation affect our brain? The answer is yes. Let me explain to you how.

The central nervous system consists of the brain and spinal cord. The brain is the only organ of the body almost completely surrounded by bone to protect it. The second important protection of the brain is the blood-brain barrier. Over a hundred years ago, scientists injected blue dye into the blood of an animal, and it colored all the tissues of every organ except the brain. This is when the name came up: there is a barrier between the brain and blood. This is a highly specialized and exceedingly selective barrier that separates the brain from most anything in the circulating blood, including white blood cells and their arsenal of cytokines and other inflammatory proteins, and dangerous substances such as chemicals, keeping them away from the body's powerful central command center. Many prescription drugs and antibiotics cannot cross it. However, there are a few chemicals, viruses and bacteria that are able to get into the brain by crossing the blood brain barrier. The blood brain barrier does allow nutrients, hormones and oxygen to go from the blood into the brain. The important point is that the brain doesn't want any inflammation. Why? There is no room for it to swell up, like your ankle if it's sprained, or your finger with a splinter. The skull surrounds the brain very closely, so if there is swelling, it really is a major problem. In cases of bleeding in the brain from a ruptured blood vessel, doctor will make a hole in the skull to relieve the pressure inside by letting the blood out.

The brain weighs about 3 pounds, which is about 2% of our body's total weight, yet uses 20% of our oxygen and calories.

It has 100 billion brain cells (brain cells are called neurons), and each brain cell has about 1,000 very thin and long threadlike "wires" called axons that transmit information to other brain cells. Each brain cell transmits

information along each of these "wires" every second at 200 miles per hour. Can you imagine how much activity goes on in the brain with 100 billion cells, each having 1,000 "wires" transmitting information to other brain cells at 200 mph all day long, every second? And can you now understand why we have to protect the brain with the skull and the blood brain barrier so as not to disrupt this activity? Every person's thoughts, memories, emotions, actions, and reactions are sent along these "wires", billions of times per second throughout the brain, cell to cell, for as long as you live.

In our brain, we have 400 miles of blood vessels that reach each brain cell. Yes, you read it right: 400 miles, all in our brain! After all, each brain cell has to get oxygen and nutrients from the blood. These blood vessels are very small in diameter. The blood brain barrier protects the brain from foreign substances, like chemicals, bacteria, viruses, etc. However, sometimes a few of these are able to get through, causing injury or infection. When that happens, it brings on inflammation. More than anywhere else in the body, the brain very carefully controls the extent of inflammation because the release by white blood cells of cytokines and other inflammatory molecules can and does sometimes lead to permanent damage in the brain, as there is no room for swelling and therefore some brain tissue is crushed and dies. The long thread-like "wires" are very, very sensitive and vulnerable to injury from these inflammatory chemicals, and can result in their destruction. When that happens, the outcome is communication failure, resulting in, for example, Lou Gehrig's disease, multiple sclerosis, encephalitis, epilepsy, and Alzheimer's disease.

You probably have heard of meningitis. This is a very serious inflammatory condition due to a bacterial or viral infection and rarely fungus, attacking the meninges. The meninges are like a cling wrap, and it is a continuous layer that covers the brain and spinal cord. When a bacteria or virus infects the meninges by attacking and getting through the blood brain barrier, the person develops fever, very severe headache, nausea and vomiting, sensitivity to light, confusion, drowsiness, and a especially a stiff neck. When meningitis is caused by a virus, it can eventually go away on its own as it may not live long, like mumps virus, influenza virus, and measles virus. These viruses invade, live a short while, and then die. You may have had mumps or the measles or the flu, and suffered for a few days then got better. On the other hand, bacterial meningitis is very dangerous, sometimes causing severe brain damage or even death in hours or a short few days, because not only is it difficult for immune cells to cross the blood brain barrier to help fight the infection, but also because if they do and the swelling of inflammation starts, the brain, not having room to puff up, gets squeezed and "crushed".

Then there is encephalitis, which is an infection of the brain, with similar symptoms as in meningitis. It is usually due to a virus, infecting the brain tissues and cells directly or by spreading to the brain from somewhere else in the body. Some of these viruses you

may have heard of, including the chicken pox virus, varicella zoster (it also causes shingles), the Epstein-Barr virus that causes mono (or mononucleosis as we doctors call it) and herpes simplex virus. Encephalitis can be also caused by viruses carried by mosquitoes. This type of encephalitis is the most common in the United States, although it is rare. These include the West Nile virus, the St. Louis virus, and others. And like many infections by viruses, this will result in inflammation, leading to seizure, coma, and death.

Lastly I want to mention Alzheimer's disease. Recently, the New England Journal of Medicine published a study showing that neurological degenerative diseases, like Alzheimer's disease, are the number one diagnosed illnesses today. It is even more common than cancer or heart disease. The death rate from these neurodegenerative diseases is up 70%, while cancer and heart diseases death rates are decreasing. To top this gloomy outlook off, the American Neurological Association predicted that among Americans, 45 million will develop Alzheimer's disease in the next few years. That is an astonishing number! It is the 3rd leading cause of death in the United States. What is the source of this terrible disease? Chronic inflammation.

In the brain of Alzheimer's patients are plaques of amyloid beta proteins and tangles of tau proteins, the classic findings for this disease. What do these 2 proteins do? They bind toxins that have made it into the brain. Over the years of exposure, they accumulate, and we know toxins cause the immune cells to bring on inflammation, and the more toxins get into the brain, the more amyloid and tau proteins are going to accumulate to bind these toxins, and the more inflammation there will be. These findings that inflammation is linked to Alzheimer's disease were reported in an article in the medical journal Brain in 2013.

Interestingly, scientists noted in several studies that patients who took anti-inflammatory medications for a time seemed to improve from their symptoms of Alzheimer's disease. Another study called a meta-analysis, which means it combines the findings of many independent studies, and published in the Annals of Neurology in October 2013, showed that the Mediterranean diet helped prevent the decline associated with Alzheimer's. This was confirmed in another study published in the medical journal Epidemiology in the same year and showed the same results, and both concluded that the Mediterranean diet is beneficial in preventing Alzheimer's disease and in reducing symptoms in those who already suffer from it. There you have it! And why the Mediterranean diet? Well, as you probably already figured out, it is anti-inflammatory. The PREDIMED study of 772 people published in 2010 clearly demonstrated the anti-inflammatory effects of the Mediterranean diet. I explain the Mediterranean diet a little later on.

Let's take a look at heart disease and how it is directly linked to chronic inflammation.

CARDIOVASCULAR DISEASES

Heart disease, which includes heart attacks and stroke, is the number 1 cause of deaths in the United States, killing more than 800,000 Americans every year. It kills more people than all types of cancers combined. The most common heart disease is coronary heart disease, killing more than 400,000 people annually. Someone has a heart attack every 34 seconds, and every 60 seconds someone dies of a heart disease related problem. Heart attacks are especially dangerous if they occur outside of a hospital, where only 10% of people survive. Men are not the only ones to be affected. To give you an idea of how this affects women as well as men, 1 in 31 women die of breast cancer, whereas 1 in 3 women die of a heart attack.

Chronic inflammation is common in heart disease and stroke patients. Remember the splinter in your finger: your immune system responds with inflammation as I have described before. In

the same way, risk factors like cigarette smoking, eating processed foods, and lack of exercise, affect the inner wall of arteries: there is ac buildup of fatty deposits, narrowing the arteries and increasing the likelihood that they will become blocked. These fatty deposits don't belong in healthy arteries, and so the immune system considers it foreign and mounts an inflammatory attack. Smoking is not as common as it used to be, but what has increased a lot is eating ultra-processed foods. A recent study from Tufts University Medical School in Boston shows that breads, soft drinks, fruit drinks and milk-based drinks; cakes, cookies and pies; salty snacks; frozen and dinners; pizza and breakfast cereal are the main culprits. This study was based on 9,300 adults and children. Foods loaded with sugars and simple carbohydrates, or processed with omega-6 oils for long shelf life, these have been the principle diet of America for several decades, contributing to heart disease. And so you can check which omega-6 oils you have in your kitchen, these are the main culprits: sunflower oil, corn oil, safflower oil, soybean oil, shortening, and margarine. Better throw those out and switch to virgin olive oil or coconut oil.

How do these processed foods cause inflammation? Dr. Lundell, a distinguished heart surgeon who has performed over 5,000 heart surgeries, explains it this way: visualize rubbing a stiff brush repeatedly over soft skin until it becomes quite red and nearly bleeding. You keep this up several times a day, every day for five years. If you could tolerate this painful brushing, you would have a bleeding, swollen infected area that became worse with each repeated injury. This is a good way to visualize the inflammatory process that could be going on in your body right now. Dr. Lundell has peered inside thousands and thousands of arteries, and that is what the inside looks like, as if someone had used a stiff brush on the inside wall of the arteries that bring oxygen and nutrients to your heart muscle, your coronary arteries, again and again for years. Let me give you another example: take some syrup and spill it over your computer's keyboard: this is what takes place inside cells. When we consume simple carbohydrates such as sugar, bread, pasta, etc. blood sugar rises rapidly. In response, your pancreas secretes insulin whose main purpose is to drive sugar into each cell where it is stored for energy. If the cell is full and does not need glucose, it is rejected to avoid extra sugar gumming up the works. When those cells reject the extra glucose, blood sugar rises producing more insulin and the glucose converts to stored fat.

What does all this have to do with inflammation? Blood sugar is controlled in a very narrow range. Extra sugar molecules injure the blood vessel wall. This repeated injury to the blood vessel wall sets off inflammation. When you spike your blood sugar level several times a day, every day, it is exactly like taking sandpaper to the inside of your delicate blood vessels. Got the picture?

What about cancer? Yes, here too, inflammation plays a significant role.

CHRONIC INFLAMMATION AND CANCER

Chronic inflammation can and does lead to some types of cancers, as does tissue irritation and some infections. Let's take melanoma for example. It is the most dangerous form of skin cancer that usually starts out as a mole somewhere on your skin. About 135,000 people are diagnosed each year in the U.S. with melanoma and over 10,000 will die from it. It is especially dangerous if you get a bad sunburn or have a relative who has had melanoma: your risks are increased. When melanoma is caught and treated early by removal, it is almost always curable. However, if it is discovered later on, it may have already spread to other parts of the body and becomes harder to treat. Melanoma is caused by exposure to ultraviolet (UV) light (to be exact, UV-B), either from the sun or from tanning beds. The International Agency for Research on Cancer (IARC) has stated that tanning beds are "carcinogenic to humans", meaning they cause cancer, and that anyone using a tanning device before age 30 is up to 75% more likely to develop melanoma.

When you get out into the sun and overdo it, and forget to use sunscreen, and don't wear a wide brimmed hat, and don't cover your skin with clothes, you may get sunburned. What that really is, you are causing inflammation of your skin, and secondly, you are causing special cells in your skin to start producing melanin, the substance that gives your skin its color. Let me explain your skin to you: it is not as simple as it sounds, and you are going to see how wonderfully made your body really is.

The skin is the largest organ of the body (didn't realize that, did you?) and the top layer of your skin is called the epidermis; it is a protective and waterproof wrap of your body (I bet you've never thought of yourself as waterproof, right?). It is a barrier to infection as well. There are no blood vessels in the epidermis, so it is nourished from the layer underneath, the dermis. Skin cells are made just below the surface, and work their way to the top, then slough off: you replace all your skin cells about once a month!

The epidermis contains cells called melanocytes; in an area about the size of the tip of a pencil, there anywhere from 1,000 to 2,000 melanocytes. Melanocytes produce melanin, which gives skin its color. People whose ancestors lived around the equator where the sun is the strongest have brown or dark skin from melanin to protect them from the sun. Melanin protects your skin from UV light, and when they are produced by melanocytes in response to sun or tanning beds, the result is darker skin, known as a tan.

The next layer of the skin is the dermis. Here are were your hair follicles are anchored, helping you grow hair, and each root of every hair, even the tiny little ones you can barely see, has a little muscle attached to it that tightens whenever you are cold or scared: we call this goose bumps. Your dermis is where you make skin oil that helps your skin stay smooth and soft; it is where your sweat glands are that help you stay cool and assist the body it getting rid of toxins. Your dermis is where you feel things such as pain, touch, and heat by sending nerve signals to your brain. Lastly, this is where blood vessels course through to feed your skin with nutrients and also where things you put on your skin are absorbed into these blood vessels.

Underneath the dermis is the subcutaneous layer consisting mostly of fat: it helps cushion bumps and tumbles. This layer connects your skin to muscles and bones, and provides larger blood vessels that help you keep from getting too hot or too cold.

Melanomas start because of chronic inflammation of the skin, like when you are getting sunburned over and over again. The melanocytes keep producing melanin and your tan deepens. The one exception is this: one bad sunburn can cause melanoma, and no one knows why. Remember what you read above how inflammation causes swelling, redness, pain, heat, and discomfort when you use that body part, like in a splinter in your finger? Well, when you are sunburned, all these same signs are there and quite visible: you are red, your are hot, your skin is actually swollen but because it is so flat you may not notice, and even putting on clothes and moving around can be painful. All the immune cells involved in inflammation start working there when there is a sunburn, plus there is one more very important aspect: UV light damages DNA. DNA is the coding in every human cell and contains the instructions for that cell to develop and reproduce. When DNA is damaged, like when UV light damages the DNA in the melanocytes in your skin, instead of an orderly reproduction (meaning normal multiplication of cells), they go haywire and start reproducing over and over again. When a cell does that, it becomes a tumor. A tumor is the abnormal growth of tissue, and in this case it is of melanocytes. And this then becomes then a melanoma. A melanoma goes deep, like an iceberg: what you see on the skin is just the top of the cancer; the rest is deeper, invading the layers of skin underneath and if not stopped by surgical removal, it can spread and invade other organs.

In melanoma, we have 2 triggers: first is the inflammation from sunburn, and second is

the damage to the DNA in melanocytes, making them multiply constantly and abnormally, secreting melanin. When a person sunburns chronically, then inflammation becomes chronic, as does the damage to the DNA of melanocytes. And these two together can lead to a melanoma. This shows you how our immune system react with inflammation where no microorganisms are present, such as bacteria and viruses, nor are there any toxins, such as chemicals. The trigger for inflammation is the damage to cells from sun and UV light.

Recently, scientists have shown another link between inflammation and cancer, and this is a good link. The medications commonly taken to block inflammation, though most people take them to stop pain, such as aspirin, Tylenol, Advil, Motrin, etc. have been shown to prevent certain kinds of cancers of the colon, lung, mouth, and stomach.

Chronic inflammation is also the cause of autoimmune disorders. **Autoimmune diseases** happen when the immune system starts attacking our body's own tissues. Why would the immune system confuse our own body and our own organs as foreign? Why would the immune system attack it's own brain as in multiple sclerosis, or its own intestines as in Crohn's disease, or its own joints as in rheumatoid arthritis, among many others? There are over 80 autoimmune diseases and they are 3 times more common now than they were a few decades ago. You could think it's because we have better detection methods, or because we recognize them easier. That is not correct. More people are getting autoimmune disorders than ever before.

Our immune system is responsible for a remarkable and amazing task: attack anything that is an invader and that is foreign, and at the same time, ignore all the cells and tissues of our own body. This system is incredibly complex and when working well, it successfully protects our body from harm by attacking and eliminating the million of invaders that try to get into our tissues throughout our lives. But something has changed over the last 50 years, since shortly after World War II. Something is pushing the immune system over the edge, to where the lines become blurred, and it attacks self. The cause of this disastrous miscalculation comes from the myriad of environmental toxins we are exposed to each and everyday, and that impede the way the immune system communicates with the body.

Our diet has changed dramatically since the Second World War. For thousands of generations, we ate food right after harvest and when it was in season. There were no strawberries in December. Meat was caught in the wild, some was raised, and it was cooked and eaten usually on special occasions like weddings or religious holidays. There were no 18-wheelers hauling foods from California to Texas, from Florida to New York, or from the Midwest to Oregon. In the last 50 years, our foods have undergone huge transformations as never before in the history of humans. We have developed new strains of wheat, rice, soy, corn, and others. In the United States, there are more GM (genetically modified) crops than the rest of the world combined and

they make up the bread, pastas, cakes, cookies, tortillas etc. that we eat regularly. We spray our crops with herbicides, insecticides, pesticides, and fungicides to the tune of 2.3 billion pounds a year. This goes on the vegetables, fruits and grains we eat. When it rains, these chemicals soak into the soil, then are sucked up by the roots and they end up in the fruits and vegetables. Our dairy cows are injected with hormones, which pass into the milk, butter, yoghurt, cheese, cream cheese, ice cream, etc., which is why we can't sell a stick of cheese to so many other countries, not even to our northern neighbor Canada. Antibiotics and hormones are fed and injected into our cattle and pigs, chickens and turkeys in Concentrated Animal Feed Operations (CAFOs). Our foods and beverages contain loads of artificial chemicals, such as artificial flavorings, sweeteners, colorings, and preservatives. We use plastics abundantly for food packaging and bottles, which contain Bisphenol A (BPA), a chemical that is known to harmfully affect our hormones. The government had to step in and ban BPA from baby bottles and pacifiers. We use more antibiotics per person than any other industrialized country in the world; we take antacids, anti-histamines, acid blockers like Zantac and others, all available over-the-counter, all of them chemicals, and we consume these regularly. Here is the label from a food picked up from a supermarket and available all over the country, and can you pick out the only natural products on this list? There are only two: water and egg; the other 60 are chemicals.

The results are tragic: autoimmune disease is one of the top 10 leading causes of death in female children and women of all age groups, and it affects over 50 million American. The symptoms are many and can affect all the organs of the body. Genetics play a part, but only in 30% of cases.

The reason is all the environmental chemicals and if so, why isn't everyone affected? Remember this important point: everybody's immune system is unique and different, like a fingerprint. Some people may be able to drink a six-pack of beer and barely feel a thing; others after one beer are quite affected. Each of us is special in our own way. That is why some are more affected than others. We don't know what triggers autoimmunity in some people; in 30% of cases, it's genetic, but in the other 70%, it is now considered to be due to the onslaught of all the environmental chemicals that we are exposed to, that we eat and drink.
Multiple sclerosis, the most common disease among young adults that affects the nerves, is due to a misguided attack on myelin. Myelin are the wires that carry all our nerve impulses that allow us to move, think, speak, feel, hear, etc. All these "wires" are like electrical wires, and myelin is the insulation that coats all these "wires". Myelin insulates and protects these "wires" and help speed nerve transmission. In multiple sclerosis, only the myelin in the brain is affected, not the ones that course throughout the rest of the body. The myelin is slowly eroded by the attack by the immune system cells, resulting in problems with muscle coordination and vision. Multiple sclerosis is known in medicine as a chronic inflammatory disorder of the nervous system.

MEDICAL IMPLANTS

You could ask what about implants, they are foreign too. What about those used in orthopedics (knee joints, hip joints, etc.) cosmetic implants (breast implants, dental implants, etc.) or cardiac pacemakers and cochlear implants to be able to hear? Can they cause chronic inflammation? Implants are of increasing importance in modern healthcare. However, surprisingly little is known about the compatibility of what they are made of once they are inside a person. Mostly, these materials are inert and non-toxic, but they can cause adverse reactions, including inflammation and infection. The body's response to these implants, especially if they release tiny microscopic fragments (imagine grinding, as in a joint), is that of chronic inflammation leading to implant failure.

Let's take a look at what can happen. There are studies that show that any of these implants can cause a hypersensitivity reaction, a type of allergic reaction. Up to 13% of the American population is sensitive to nickel, cobalt, or chromium, and many implants are made with these. It is not unusual for people to develop metal sensitivity after implantation of orthopedic hardware. However, infections can occur as well as mechanical failure of the implant, and inflammation also. There is ongoing research in this area, so unfortunately, problems will continue to happen with implants. However, if you are going to have an implant or already have one, implement what is written later on below.

Chronic inflammation is at the root of the great majority of chronic diseases and is a major factor in the leading causes of death in the United States. Think of all the chronic diseases you've heard and read about, they are all linked to chronic inflammation:

- Cancers
- Cardiovascular diseases
- Obesity
- Heart disease
- High blood pressure
- Stroke
- Diabetes
- Multiple sclerosis
- Alzheimer's disease and dementia
- Autoimmune disorders (rheumatoid arthritis, lupus, etc.)
- Emphysema
- Thyroid diseases
- Kidney disease
- Fibromyalgia
- Chronic Fatigue Syndrome
- Arthritis
- Colitis
- Prostatitis
- Liver disease
- Eczema
- Chronic sinusitis
- Asthma
- Ulcerative Colitis
- Crohn's disease
- Chronic gum disease (periodontitis)
- Neuropathy

HOW DO YOU KNOW IF YOU HAVE CHRONIC INFLAMMATION?

Kathy worked in a department store, was married, and had 2 children. At age 37, she exercised 3 times a week in a part of the garage her husband had converted for weight training and there was a treadmill. She was careful about what she ate, making healthy food choices for herself and her family. She felt tired a lot, and thought it was due to her being on her feet all day at work; she also thought this is why her joints and muscles ached. She had difficulty getting a good night's rest, and she thought this was why her brain felt "foggy" so much of the time. Her

memory wasn't as good as before, and she suffered from headaches. She was sure it was due to her weight. She was 5 feet 2 inches tall and weighed 179 pounds. But try as she might, she could not shed those extra pounds. By the time she got home, after working on her feet all day, then preparing supper, she was exhausted. She knew that the short time she spent on the treadmill was not enough. She had tried several diets, and most of them worked briefly, but she would eventually gain the weight back. Like most folks, she thought her weight problem was due to eating too much and a lack of exercise. Isn't that what everybody reads, hears about, and now it's almost like you instinctively know it? Too many calories and not enough exercise? But that is not really Kathy's problem, and it is not the problem for all the people who think that losing weight is just a matter of exercise and diet.

Let's break this down. People think that they are fat because of too many calories and not enough exercise. Well, let's look at that. The average American woman's daily intake of calories is about 1,800, and for the average man, it's 2,600 calories. So let's take 500 calories away for the average woman and take ½ of the calories away from the average man. That makes it 1,300 calories for every man and woman and if that were our daily intake we would solve a lot of the problems of weight, obesity, and so on. Wrong. Let me show you why. If you ate 6 Snicker Bars a day, that would add up to 1,290 calories: 2 for breakfast, 2 for lunch, and 2 for dinner. Do you think anyone would really loose weight? Not likely. Not only that, but they would become seriously deficient in so many nutrients that they would get sick. So counting calories to loose weight is not the way to go.

Kathy's real problem is the accumulation of chemical toxins in her body. The toxins in a person's body cause chronic inflammation as we have discussed before. There are so many we are exposed to on a daily basis. The body has to do something with all these chemicals. The immune system brings on inflammation but cannot "kill" chemicals. They accumulate in the body. Where do they accumulate? In fat cells. Fat cells are storage cells; they have a very slow metabolism. The more chemicals, the more fat cells. It's that simple.

Your fat tissues are not as vital to your immediate survival as other tissues are. This doesn't mean that fat is not important; it is more a function of your body instinctively trying to preserve the most important tissues whenever it can. When the body gets to the point of having to start storing toxins outside fat cells, and in other tissues, we get into even more serious problems. If the build-up of toxins in an organ gets to a certain level, the person may have organ failure or gland failure, for example the thyroid gland, kidney failure, or liver degeneration. But that is not all: if toxins start accumulating inside cells and the nucleus of cells get affected, that is where the DNA is located that controls everything cells do. When that happens, as the DNA also controls reproduction of cells, they may start replicating uncontrollably, which is the characteristic of malignant growths.

Recently, an alarming fact was discovered by scientist: **environmental toxins make people fat and cause diabetes**. Once inside the body, these chemicals and the inflammation that follows disturb our ability to metabolize carbohydrates. But I am sure you have not heard about this significant study. Do you know why? Because there are no drugs to treat this. So our bodies have to get rid of these toxins, but if you are relentlessly exposed to them on a daily basis, and your detoxification apparatus is not in tiptop shape, then they will accumulate: imagine not taking out the garbage in your home: it keeps piling up and really smelling bad, with all kinds of things growing on it. Our environment is steeped with chemicals that our bodies were not made to process, and so they build up along with chronic inflammation.

The solution to Kathy's problem is not going to the doctor and him whipping out his prescription pad and giving her one drug for headaches, another drug for sleep, another drug for muscle and joint aches and pains. It is to lower the toxic burden in her body. I had to show her how to do this without having to go spend a month at an expensive spa somewhere in California. First, she had to drink way more water to help the kidneys flush out the waste from the blood, and she could easily do this at work, drinking from a glass bottle, not plastic (read why in a different section). I told her to watch her urine: it had to be almost clear with maybe a tinge of yellow. Drinking plenty of water will also help her get rid of toxins through her stools, and I told her to eat more fiber because it helps clean out the colon and lowers blood sugar:

Split peas.
Lentils.
Black beans.
Lima beans.
Baked beans.
Artichoke.
Green peas.
Raspberries.
Pear with the skin on.
Apple with the skin on.

I taught Kathy how to help relax and breathe out toxins by breathing with her belly, taking a deep breath slowly through her mouth and then slowly exhaling through her nostrils, pushing the last little bit of air out.

Lastly, I told her to sweat. The skin is the largest organ of the body, and contains 3-5 million sweat glands. When we sweat, we get rid of toxins. I told her that ideally she would workout in the gym her husband had built in their garage, but as a second choice, she could detox in a

sauna or steam bath. Saunas and steam baths have been used for many centuries: they help with weight loss, improve circulation, and get rid of toxins.

Here are the 15 common signs of **Chronic Inflammation:**

1. Fatigue
2. Mood swings
3. Sleep disturbance
4. Muscle and joint aches and pains
5. Anxiety/Depression
6. Low-grade fevers or feeling hot often
7. Headaches
8. "Foggy" brain
9. Feeling weak
10. Decreased libido
11. Blurred vision
12. Abdominal pain, diarrhea or constipation, bloating
13. Uncomfortable or frequent urination
14. Multiple sensitivities to food, medicine, other substances
15. Weakness, including muscle weakness

3 THINGS YOU CAN DO RIGHT NOW TO START TO ELIMINATE CHRONIC INFLAMMATION:

1. **Stop drinking sodas, diet or otherwise.**

2. **Seriously reduce eating anything that contains sugar and quit eating or drinking anything with artificial sweeteners.**

3. **Start adding organic foods, especially vegetables and fruits to your diet, while reducing non-organic foods**.

CHEMICALS ALL AROUND US AND EVERYWHERE.

Mainstream medicine doctors try to identify the cause of acute inflammation, such as bacteria, and treat it with a specific medication such as an antibiotic. However, when tackling **chronic inflammation**, their approach is to do more tests, and treat every symptom with another drug or pill. The danger of this type of treatment is that you end up taking multiple medications, each having its own set of side effects, and you end up feeling worse. A recent study from the

Mayo Clinic showed that more than 50% of Americans are taking 2 or more drugs. The most commonly prescribed medication after antibiotics are antidepressants and painkilling narcotic drugs, especially in young adults and middle-age people. Adverse drug reactions resulted in 4.6 million emergency room visits in 2009 in America.

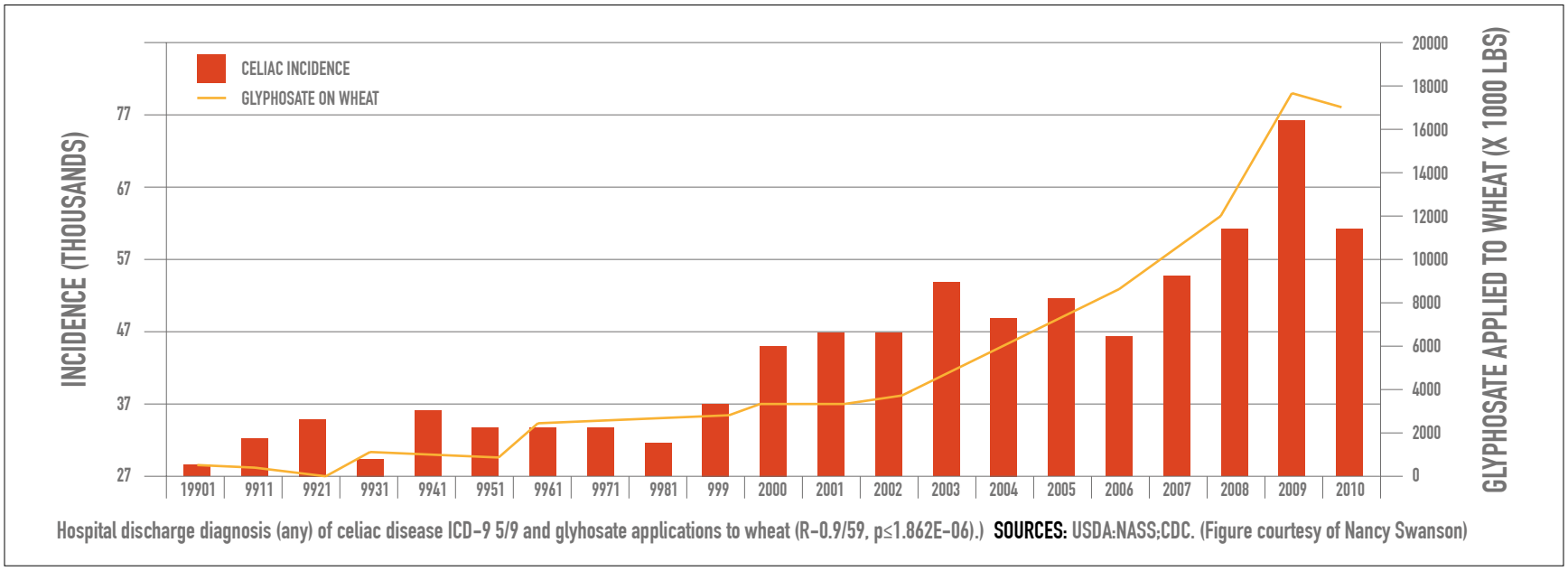
I don't believe that almost half of all Americans are depressed or need a pharmaceutical medication. I do believe that when you feel sick all the time, it would be normal to end up depressed because you are not enjoying life, you can't do the things you want to do or go where you want to go. These things do bring you down. If you get rid of what is making you chronically ill, you won't be depressed anymore, and you will liberate yourself of your other symptoms that are dragging you down. So let's get rid of that **chronic inflammation and how it leads to being overweight and to obesity. More on how to do this later on...**

Where does all this exposure of foreign substances come from? In the United States, we manufacture 5 trillion pounds (that is 5 with 12 zeros) of 80,000 different chemicals per year, of which only 1,500 have been studied for toxicity. We use 2.23 billion pounds of pesticides, of which only 10% have been tested for toxicity. In the National Health and Nutrition Examination Survey (NHANES) study of 2009, conducted by the Centers of Disease Control and the National Institutes of Health, blood and urine from 2500 volunteers were found to contain an astonishing 212 chemicals, from triclosan found in antibacterial soap, to bisphenol A (BPA) found in plastic containers (water, juice, soda, etc). None of these people had any occupational or residential risk for toxic exposures.

In the past 60 or so years, we have added tens of thousands of new environmental factors, including chemicals, man-made substances, foods, liquids, etc. For example, most of the 80,000 chemicals that are used commercially throughout the United States were discovered within the last several decades; they did not exist before. The U.S. Environmental Protection Agency (EPA) estimates that emissions from industrial plants and facilities easily reach 2.5 billion pounds annually, making it very likely that any person in this country is exposed.

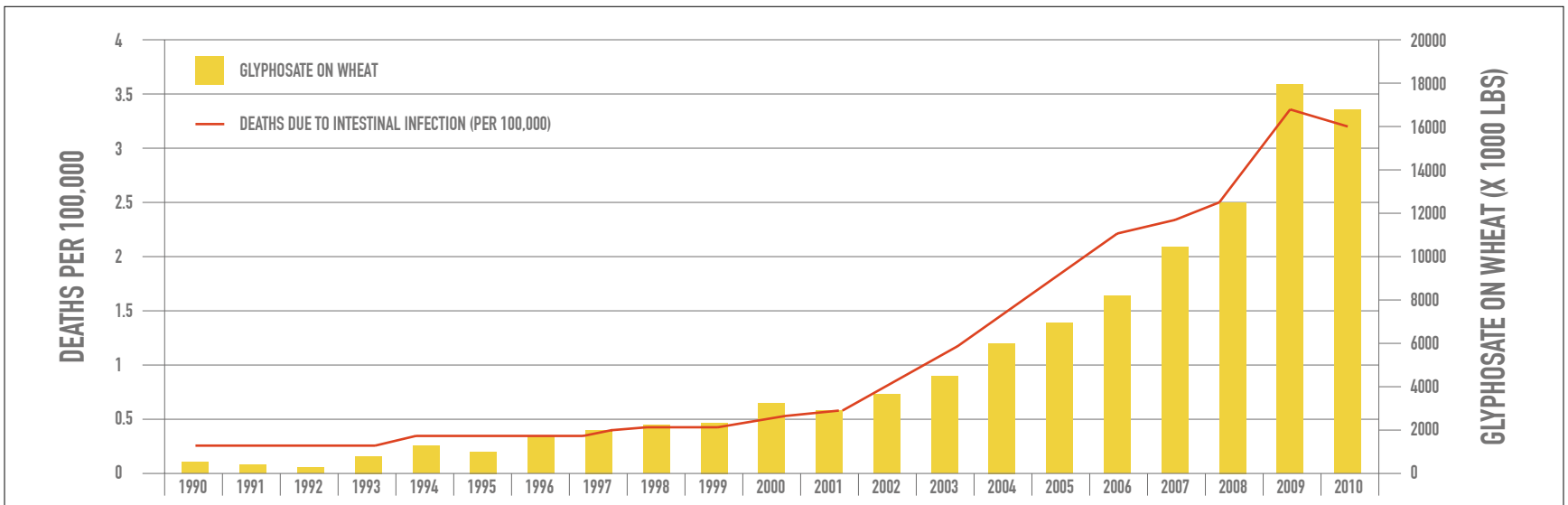
At home and at work, we have carpeting and artificial flooring, and all these synthetic materials and fibers release formaldehyde into the air for months and years. Toothpaste, perfumes, colognes, soaps, shampoos, cosmetics, all contain chemicals. Did you know that if you eat a teaspoon of toothpaste, you are instructed to call the Poison Control Center? It's printed right on the tube of toothpaste! When we have our clothes dry cleaned, that whole industry uses a chemical called perchloroethylene, a known carcinogen, and we wear it on our skin. Curtains contain a chemical used as a fire retardant, as do the interior of cars (that new car smell). Most of us are exposed to these chemicals every day.

Hospital Discharge Diagnoses of Celiac Disease (Gluten Sensitivity) andGlyphosate (Roundup) Application to wheat in the U.S.



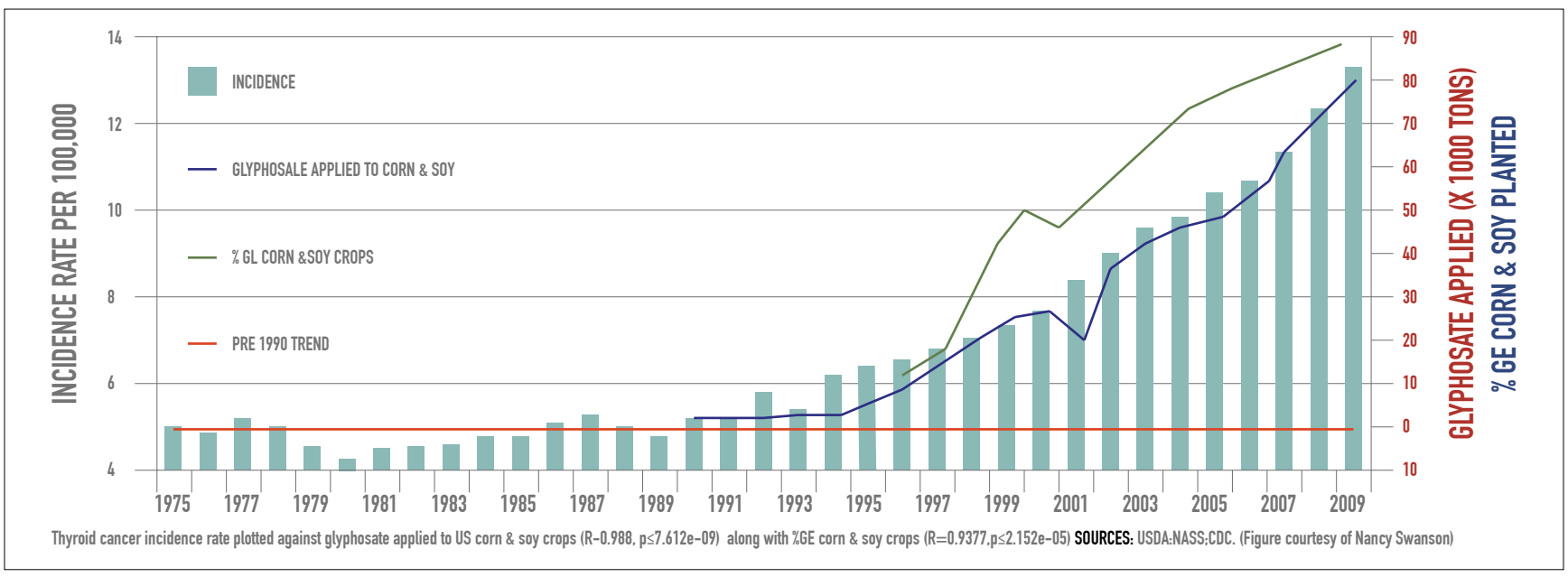
Hospital discharge diagnosis (any) of celiac disease ICD-9 5/9 and glyhosate applications to wheat (R-0.9/59, p≤1.862E-06).) **SOURCES:** USDA:NASS;CDC. (Figure courtesy of Nancy Swanson)

Deaths due to Intestinal Infections with glyphosate (Roundup) applications to wheat.



Deaths due to intestinal infections ICD A04, A09;08,009 WITH GLYPHOSATE APPLICATIONS TO WHEAT (R-0.9834, p≤3.975e 09) **SOURCES:** USDA:NASS;CDC. (Figure courtesy of Nancy Swanson)

Thyroid Cancer incidence rate plotted against glyphosate (Roundup) applied to U.S. corn and soy crops.



Thyroid cancer incidence rate plotted against glyphosate applied to US corn & soy crops (R-0.988, p≤7.612e-09) along with %GE corn & soy crops (R=0.9377,p≤2.152e-05) **SOURCES:** USDA:NASS;CDC. (Figure courtesy of Nancy Swanson)

And what about food? Fruits, vegetables, and legumes are sprayed with insecticides, pesticides, and fungicides. The most used pesticide in the U.S. is called Roundup (a.k.a. glyphosate) and we use more of it in this country that the rest of the world combined. Roundup residue can be found on the main foods we eat: corn, soy, sugar, wheat, canola and others. This chemical stops a key enzyme in the liver from working that we need to help us get rid of chemical toxins. Because Roundup blocks this liver enzyme's function, toxins accumulate in the body. What is the result of this? Chronic kidney disease, gastrointestinal disorders, obesity, diabetes, heart disease, depression, autism, infertility, cancer, and Alzheimer's disease.

In the U.S. we use genetically modified (GM) crops. These crops resist many applications of pesticides, so you can spray them again and again with Roundup. The Food and Drug Administration (FDA) allows 145 crops to be raised this way, including soy, wheat, corn, barley, potatoes, canola, zucchini, squash, tomatoes, beets, and papaya. The manufacturer, Monsanto, tells us that these are safe, yet strongly resists the labeling of food as such. It is important to note that all the European countries, Japan, Australia, and many others ban or restrict the use of GM crops.

Dairy cows are injected with hormones (called rBGH) that get passed on into milk, cheese, butter, sour cream, cottage cheese, and ice cream. And did you know that even Canada will not buy our dairy products because of this? Not even a stick of butter or a block of cheese! You can add Japan, Australia, New Zealand, and the 27 countries of Europe to that list.

I love a good steak. Going out to dinner and eating a good steak is a pleasure many of us look forward to. There are eight grades of meat: prime, choice, select, standard, commercial, utility, cutter, and canner. In order to be graded, meat must me inspected by the USDA. If you see the USDA little shield on the packaging that means it's been inspected. Most meat at the supermarket is either choice or select. Sometimes you can get prime. Better yet, if you can find a good butcher shop and develop a decent relationship with them, that is the best way to get good cuts of meat.

The steaks in supermarkets come from cows or steer that are two to three years old; younger beef is more tender and marbled, so it ends up as the more expensive steaks. Now say you want to buy ground beef to make hamburgers, or for a spaghetti sauce, etc. That meat comes from retired dairy and breeding cows that are usually from six to eight years old. During all that time, these animals got a lot of chemicals in their feed and by injection. How come? Read on…

Let's talk about what many consider the staple American diet: meat and potatoes. Meat is a core of the traditional American dinner. Nothing like firing up the grill, throwing some thick steaks on it and getting loaded baked potatoes ready: yum! Like most of people, you do your

shopping at the supermarket and get your beef, pork or chicken from the meat section, and your cold cuts from the deli section. Where do think these meats came from? Let me tell you: CAFO's. That stands for Concentrated Animal Feed Operations, and according to the EPA (Environmental Protection Agency, a branch of the federal government), there are about 275,000 of these specialized farms in the United States, and this is where cattle, hogs, chicken and turkeys are grown to eventually end up as food on our plates. The EPA defines these as "a production process that concentrates large numbers of animals in relatively small and confined places, and that substitutes structures and equipment for feeding, temperature controls, and manure management for land and labor" and that "does not produce any vegetation". Putting millions of cattle, hogs, chickens and turkeys into small spaces is not very healthy and hugely increases the likelihood of infection, so large quantities of antibiotics are used in both what these animals are fed and by injection. Another factor is that antibiotics increase the weight of these animals. Up to 80% of all antibiotics sold in the United States are used in these CAFOs. In 2013, 32,534,821 million pound of antibiotics were sold for use in food-producing animals. On top of that, these animals are given hormones and de-worming medications to speed the process up to where they are slaughtered without getting too sick. Beef sold from these operations contain up to 211 different drugs according to the USDA Inspector General report. Remember, you eat what you eat eats. Get it?

What happens with all these hormones, antibiotics and de-worming medications? They end up throughout the animal, including the parts that we eat. When we eat these meats, we are getting residues of all these chemical products. And by now you know that the immune system is going to consider all of them as foreign and go into attack mode with inflammation to get rid of them. The more often you eat meats from CAFOs, the more of these chemical product residues you are getting, the more often your immune system attacks these with inflammation, and the inflammation becomes chronic.

Have you read lately about how there are more and more resistant bacterial infections in the United States? The Centers for Disease Control published a report that this is due to the massive amounts of antibiotics used in pork, chickens, turkeys and cattle. So when we eat a baloney or salami sandwich, sausage links with breakfast, a steak, or chicken and turkey, we are getting a good dose of antibiotics, plus all the other drugs they use in these CAFOs. And if you think these antibiotics and other drugs disappear when they are cooked, you are wrong.

What about chicken? It is generally accepted by the government that about 25% of all raw chicken is contaminated with Salmonella, a bacteria that has been known to cause illness for 125 years. You have probably read or heard on the news about people getting sick from eating chicken and recalls being made. Sometimes these are from fast-food joints. Most people infected with Salmonella develop fever, abdominal cramps and diarrhea within 12 to 72 hours

after eating the contaminated food. The person will be sick for about a week, and some need hospitalization due to the diarrhea or because the Salmonella spread to the blood stream to other organs of the body. The Centers for Disease Control states that Salmonella causes 1.2 million illnesses, 23,000 hospitalizations, and 450 deaths every year. Are you starting to understand inflammation and what it can do to us? Salmonella is a bacteria and doesn't belong in the body. It causes damage and the immune system will attack any and all bacteria with inflammation to protect the body.

The CAFOs discussed previously above use an additive chemical called ractopamine in feed for cattle and swine, so all our beef and pork products are contaminated with it. Ractopamine promotes leanness in these animals and reduces the fat content, increasing the profit per animal. Ractopamine is banned in 160 countries, including all of Europe, China, Taiwan and Russia, but we have been using it since 2003 and continue using it. We don't even test for this drug in the meats sold to us for food. When you have a steak, or some ham or bacon, or a hamburger, any meat from cattle or pigs, you are eating some of this chemical. What can it do to you? The Center for Food Safety (CFS) states that "data from the European Food Safety Authority indicates that ractopamine causes elevated heart rates and heart-pounding sensations in humans." So here is another chemical we are regularly exposed to.

The good news is that there are now a number of companies that sell high quality meats, such as Niman Ranch, Laura' Lean Beef, and others, and their availability is increasing. That is good news!

The important thing to remember in all this about the meats we eat is this: if they are not grass fed and organic, they contain chemicals, hormones and antibiotics. For thousands and thousands of generation, cattle ate grass, not commercially made artificial cattle feed; they were not fed and injected with hormones and antibiotics. Remember, you are what you eat eats, so if you eat grass fed beef that was raised the natural way as they were for all of history until the last 50 years, you won't be swallowing all those chemical products. Chemicals don't belong in the body: the immune system will try to get rid of them with inflammation, which turns into chronic inflammation as we continue to eat these foods. I trust you are starting to get all this about chronic inflammation and where we get it from.

A person might well ask: I am a vegetarian and I don't eat meat, where else do chemicals come from that cause inflammation in me? How are they getting into my body and creating all these problems. Let me show you one way. Remember, prescription drugs are actually man-made synthetic chemicals approved by the Food and Drug Administration for use in humans. They are not natural products. When something foreign is introduced into the body, the immune system is programmed to respond to it, and that response is inflammation. If you are exposed to, eat and drink foods and beverages containing chemicals every day, the immune response of

inflammation will become chronic.

Let's take a trip into how illness or sickness is dealt with today. You go to your doctor, or are admitted to a hospital when you feel sick and unwell. They do what they are trained to do and you are tested, diagnosed, operated on, stitched back together, and given prescription drugs. All of what you just went through is dedicated to a system of health focused on fixing a single disease or illness, or resolving one medical issue or episode, like a heart attack or appendicitis. Sadly, this is not a method that can address the many chronic medical illnesses that are so prevalent today. In this country, we are great at resolving an acute problem, a crisis situation with a person, like a stroke, or a heart attack, or a car accident. However, when it comes to managing chronic illness, there is a vast deficiency in medicine, and because 80% of our health care dollars are spent on chronic problems, we need to find a solution. Unfortunately, we are not geared for that.

How did the above situation develop? It started with a cure for infections. Previous to penicillin, there were very, very few drugs. For example, aspirin just started being used 125 years ago. Doctors used herbs, vegetables, fruits, and mixtures of these. For example, scurvy is a disease caused by a lack of vitamin C; it was very common disease especially among sailors who would be on a ship for weeks or months without eating any fresh fruit or vegetables. In due course, a Scottish doctor wrote about how eating fruit such as oranges or limes would prevent scurvy; they didn't know about vitamins at that time. Up to then, more British sailors died of scurvy than from fighting the enemy. The British navy then gave every sailor one lime daily to eat, and that is how they got the name "limeys" and solved the problem by treating the cause of the disease, not the symptoms.

Medicine was a system where doctors did what they could to help the patient to ease their discomfort with creams using substances found in nature, purging (laxatives), and sometimes deliberate bleeding (called bloodletting). Doctors made house calls, and diagnosed by sense of smell, listening, touching, feeling, palpating, examining. Laboratory testing was basically unknown. Eventually we learned about vaccines, transfusions, X-Rays, and the theory of germs causing diseases. Up until the end of World War II, pneumonia was one of the top 3 killers in the United States. Old and young, rich and poor, a lot of people died of pneumonia. Imagine getting bronchitis, which today is not a serious medical problem; back prior to WWII, anyone who had bronchitis was in a very serious crisis: it could lead to pneumonia and death. Then a Scottish doctor, Sir Alexander Fleming, working in his laboratory, discovered that a mold called Penicillium notatum killed bacteria known as Staphylococcus (usually called Staph). With this, he developed penicillin, and changed medicine forever. Now we could get rid of infections, whether it is was pneumonia or most other types. Penicillin started a whole pharmaceutical industry that began producing all types of synthetic antibiotics, and we got rid of diseases that

had been part of humankind since Adam and Eve: tuberculosis, gangrene, syphilis, and many others. Penicillin was a wonderful discovery, and it has saved hundreds of millions of lives around the world. And this all started after World War II in the mid 1940's.

Pharmaceutical companies then began searching and researching for more medications now that they had the model of penicillin: a single drug that could cure a lot of diseases. And something changed: doctors started relying more and more on a pill to treat the worst symptoms of a disease rather than trying to uncover the cause, then getting rid of that cause, which would get rid of all the symptoms. Do you have headaches? Here a prescription pill for that. Oh, you also feel tired a lot? Here is another pill for that. And you have joint aches and pains too? Here is a pill for that. Few doctors go to the trouble to take time with patients and review their medical problems with them. The average office visit in the United States lasts 15 minutes. Today doctors rely more on prescription drugs. Sitting down with the patient and reviewing with them nutrition, diet, prevention, exercise, lifestyle changes, all have fallen by the wayside. Patients are given a handout sheet or booklet to read, so doctors can go on and treat the next patient, rather than spending time with them and explaining what is best for them. Our system of health care does not promote individual attention. Health insurance companies reimburse doctors the same amount if they spend 15 minutes per patient or take extra time and spend 45 minutes with that same patient.

So you see the problem. Say you see your doctor: you don't feel well, you have no energy, your ability to think clearly and concentrate are going downhill, your sleep is off, and you just feel lousy. Your doctor, sincerely wanting to help you, whips out his or her prescription pad, and having a thriving pharmaceutical industry that sends representatives to visit doctors regularly to leave samples for them to use, and have lunch or dinner meetings to present them with the latest drugs, he or she writes out several prescriptions. This is known as polypharmacy, poly meaning many.

Let's use the example of a woman who is in her early 30's and call her Jackie. Jackie works in an office, is overweight, complains of fatigue, headaches, and joint aches and pains. All her blood tests, including those for her thyroid, are normal. Her doctor will prescribe something for the aches and pains, something else for her headaches, and a third drug for her fatigue. Remember penicillin, the first antibiotic? It was used to get rid of an infection that was causing headaches, fatigue, aches and pains, and fever. But now, Jackie doesn't get something that will cure her, like penicillin curing the infection. Instead, she is getting several medications that treat her symptoms. And let's take it another step. Say Jackie later on develops type 2 diabetes. Now she gets another prescription pill to keep her blood sugar under control. The diseases will continue to get worse over time, and her doctor will have to prescribe more and stronger medications to ease her symptoms. This is polypharmacy. Don't get me wrong, Jackie's doctor

is sincerely trying to help by using prescription drugs he or she believes will help her, but sitting down with Jackie, going over her lifestyle, her habits, how she cooks, what she eats and drinks, how much does she really walk every day, that she should include cinnamon in her food as that helps lower blood sugar, and many other things, these are left by the wayside as they would take more time and the insurance company will not pay for that extra time. That is a big part of the problem. Chronic health problems need that extra time whereas a sore throat from a bacteria or virus does not. And remember, each drug is a chemical, and all drugs have other effects besides treating symptoms.

One of the serious problems of polypharmacy that you read about is called "adverse drug reactions". This is a bad reaction that people may get when they take a medication. For example, you might find out you are allergic to penicillin because you took your tablet and quickly developed an itchy rash, runny nose, and wheezing, and you had to have a shot of epinephrine in the emergency room to reverse the reaction. Or you may start to take a different medication and get diarrhea, or headaches, or a number of other symptoms. Doctors know about these and so does the FDA: it has to approve each and every drug, along with its printed "adverse drug reactions" list. More importantly, what happens if you take several medications? You increase the likelihood of these "adverse drug reactions". But here is another problem: when drug manufacturers send their information to the FDA about a medication they are trying to get approved, there are never any long-term "adverse drug reactions" studied. Of course not: what drug company is going to follow thousands of patients closely for years and years to see what happens to them before they ever launch the drug? The FDA doesn't ask for the pharmaceutical companies to do such long-term studies, so they don't do them.

So here is what happens a lot, all over America. Let's take Bob, a 43-year-old manager in a supermarket with high blood pressure who takes his medication every morning. Unfortunately, one of the side effects of this pill is erectile dysfunction. Anyone who watches TV has seen the advertisement: two people watching the sunset sitting in separate bathtubs side by side. Whenever there is a sports event on TV, there is usually an add for a pill for erectile dysfunction for men as the pharmaceutical companies know that most of those who watch these games are males. Bob eventually tells his doctor about this problem that both he and his wife have experienced, and gets a pill to treat…the adverse side effect of the blood pressure medication: erectile dysfunction. Before starting on blood pressure pills, Bob didn't have this problem. Further on, he develops heartburn and his doctor prescribes a medication for it: there are several, and you probably have seen them advertized on TV. He started taking it daily and after a couple of months, when the prescription ran out, he started having heartburn again. So his doctor refilled his prescription and told him to just stay on the medication. A couple of years later, Bob and his wife decided to go spend a relaxing weekend at a motel near

the beach. In the middle of the night, he got up to go to the bathroom and with the room being unfamiliar, accidentally stubbed his big toe on the dresser. The pain was unbearable and the toe quickly turned purple and swelled up. A trip to the emergency room showed why: the big toe was broken, but not only broken, it was shattered. Well, one of the problems of taking a heartburn drug for more that a couple of months is that it can cause you to have brittle bones, like for Bob. What should have been a relaxing time with a minor "ouch" turned into a terrible weekend: no walking around in the sand and no swimming, and he had to wear one of those medical "boots" for several weeks.

Later on, Bob went to his doctor because he developed aches and pains in his joints. Nothing serious, but it was uncomfortable and sometimes woke him in his sleep. The doctor prescribed an anti-inflammatory medication, and it helped. But when Bob quit taking the medication after a couple of weeks, the aches and pains came back, so he had the prescription refilled and ended up taking it regularly. The medication worked great. A some time later, during a routine check-up with his doctor, Bob's blood and urine test were abnormal: he had developed a kidney disease. Thankfully, it was caught early. What caused his kidneys to get damaged? The anti-inflammatory medication, which can cause kidney disease when taken for a longer period of time, so Bob had to quit taking it. Like other prescription drugs, anti-inflammatories can cause a person to have several bad results. The FDA now requires all the prescription and over-the-counter anti-inflammatory drugs such as ibuprofen, naproxen and others to carry a warning that they can cause heart attacks and stroke even with short-term use, and the risk may begin within a few weeks of starting to take these drugs. These are all "adverse side effects" so commonly found in many Americans.

Notice I have told you about what happened to Bob and his adverse reaction to anti-inflammatory drugs. The word I want you to focus on is anti-inflammatory; after all, this is about chronic inflammation and here is an example of what happens to a lot of people who suffer from aches and pains, they grab a bottle of ibuprofen or something similar at the drug store and start taking it. Remember the ads on TV where the person takes 2 tablets every 4 hours of one medication then they switch to a long acting anti-inflammatory and smile. The key here is not to take any drug at all, but to find out what is causing the inflammation. This does not mean that you should not take a specific medication for a chronic illness; it does mean that the fewer medication you take for the shortest time possible, the better.

By the way, we used to think that genetics played an important role, like "such and such disease runs in the family". We thought that if your parents and grandparents were, for example, diabetics, well, there was little you could do about it because eventually you would get it too. WRONG! We now know different. Only 30% of diseases are handed down; the other 70% are not. How did we find this out? There were a number of studies done on twins and these

published studies showed that less than 1/3 developed a medical disorder genetically. Think about this: say your parents and grandparents were obese, but you have been athletic since school, and continue to do sports while being choosy about what you eat: no chips and dip while sipping a coke in the evenings watching TV. What you have done is what your parents and grandparents did not do, and you are not obese. Inherited does not mean unavoidable.

WE ARE EATING ALL WRONG.

What do Americans eat? A study was just published where scientist surveyed the eating habits of over 9,300 Americans, and the results were astonishing! Most of what we eat is bad for us. Two-thirds of Americans eat ultra processed food. What are these foods?

- Breads and breakfast cereals
- Cake, ice cream, and other sweets
- Soft drinks and fruit drinks
- Frozen and packaged meals
- Pizza
- Salty snacks
- Milk based drinks
- Packaged baked goods
- Chicken and fish nuggets
- Instant noodles and soups
- Packaged cheeses
- Bottled dressings and sauces

And all the foods on this list are bad for you. These ultra processed foods are made up of chemical additives. That's why they are called ultra processed. These chemicals are preservatives, sweeteners, colorings, flavorings, emulsifiers, trans fats, etc. These are all put into "fake" foods to make them look and taste real. These foods are also high in salt and sugar to make them taste good, and all together they contribute to obesity, heart diseases, high blood pressure, diabetes, and increased risk for certain cancers. How this happens is what you will read about in this book. What did the doctors and scientist say we should do? Eat more foods that you prepare yourself. Develop the habit of eating a lot of fresh fruits and vegetables, some fish and chicken, and meat about once a week.

SUGAR

During the past 25 years, the average American's intake of sugar and other sweeteners has gone way up: it is now 160 pounds a year! This means about 20 teaspoons of sugar a day! This

is not only the white stuff, but also all the artificial chemicals that are sweeteners, the worst one being high fructose corn syrup, now disguised simply as corn syrup (it contains mercury! More on this later on.) Why have we increased our sugar intake so much? Why is behind the reason from us having developed such a sweet tooth? Well, you can blame it on fat. The government has told us now for years that fat is bad for our health and that we should limit it or remove it from our diet. So companies that produce foods, especially the kind that come in boxes or wrapped in cellophane, stopped using the fatty oils for processed foods and replaced them with sugar so they still taste good. Sugars help make reduced-fat foods tastier. A cup of Kellogg's Frosted Flakes cereal contains more than 4 teaspoons of sugar. Now take a cup of coffee and put 4 teaspoons of sugar in it: it is way too sweet to drink. If you have a soda, a 12-ounce can contains 10 teaspoons of sugar. As you can imagine, I can produce a very long list or foods with sugar: even a slice of bread has sugar in it. The result of all this sugar is inflammation, and if you eat these types of foods and drink sodas and store bought fruit juices, you are fueling inflammation in your body that will become chronic.

Our ancestors got sugar from eating fruit when it was in season, or from honey as a rare treat. Our body can very easily handle small amounts of sugar. However, the refined sugars and processed foods deliver a much higher amount than what we can normally handle. The more processed the food, the faster it turns into sugar in our bodies. How does this actually happen inside our bodies? Carbohydrates include sugar and starchy foods like bread, pasta, and rice. For example, an order of medium fries at McDonald's contains 47 grams of carbohydrate. Once you eat these fries, your body will convert this to sugar (glucose) and 47 grams of sugar is about 10 full teaspoons. When you drink a soda or eat a cupcake or muffin, or have pasta for lunch or dinner, your chewing and the acids in your stomach will make bits and pieces of that food. They then pass from the stomach into the small intestines, where they are broken down to glucose (sugar) molecules by enzymes. Enzymes are proteins that "cut up" or break down into little pieces (molecules) whatever you eat so it can be sent out into different organs via the bloodstream. Now you have glucose flowing through your bloodstream, and the pancreas, a gland that sits behind the stomach, starts pumping out insulin, a hormone. Insulin takes glucose out of the blood and into your cells so it can be used as energy. Some glucose ends up in the liver and muscles for storage for whenever the body needs it, such as when you have to run across the street or when you play tennis or swim: muscles use glucose for energy, just like your car uses gasoline to run the engine. When the muscles run out of stored sugar, the liver steps in and sends it more.

But what if you down food and drink loaded with sugar, like the soda and muffin or cupcake? How does that end up with inflammation? From the previous paragraph we learned that insulin is made in response to sugar (glucose) in our bloodstream. When this sugar is high, more insulin is made, and when insulin reaches a high level, it activates the release of arachidonic acid from body tissues. Arachidonic acid is found throughout the body, and once it

is activated and released because of high levels of insulin, it can quite inflammatory.

And if you thought this was enough, remember that the immune system considers any chemicals as foreign and will mount an inflammatory attack on them to get rid of them. Well, all the artificial sugars that come in pink, blue, and yellow packets are artificial chemicals. When the immune system runs into these, it will start the inflammation cascade. Aside from inflammation, these chemical sweeteners can cause a lot of other problems. For example, Splenda (in the little yellow packets) can cause leukemia, a cancer of the blood. An article published in the Journal of Biosciences in 2012 showed that aspartame (Equal, NutraSweet in the little blue packets) can damage your brain.

If you think this means you can use "real" sugar all you want, well, you are not going to like this, but you are wrong. Sugar, the white stuff, is man-made; it is not natural, it is a processed food.

WEIGHT GAIN AND OBESITY

Everyone needs some body fat. We need it for heat insulation and other body functions. But the more you have, the more at risk you are for medical diseases and disorders, and this is common knowledge. But what is not common knowledge is that more people are overweight now than any other time in history. In the United States, 70% of the adult population over 20 years old is overweight! These are staggering numbers! And it's not only adults: 17% of children from age 6 to 19 are obese, and in small children aged 2 to 5, it is 10%.

According to the latest statistics released by the Centers of Disease Control, 80 million Americans, over one third of the population suffer from obesity. This is the designation after overweight. The difference between the overweight and obese is defined by the BMI (Body Mass Index). It is calculated by taking your height and weight: multiply your weight in pounds by 704.5. Then divide by your height in inches and divide that result by your height in inches a second time. Sound a little complicated? I agree with you. Use a much easier way: go to this website and it will do it all for you: **www.smartbmicalculator.com**.

A BMI between 25 and 29.9 is considered overweight, and a BMI of 30 or more is considered obese, and you should understand that BMI does not measure your body fat, it estimates it. For example, an athletic muscular person could have a BMI that puts them into the overweight category even though they do not have excess body fat.

CALCULATE YOUR BMI NOW:

GO TO: **www.smartbmicalculator.com**

Obesity is considered the number one health risk in America today, and results in approximately 400,000 deaths each year! It increases your risk for a number of serious medical conditions and diseases, including heart disease, high blood pressure, diabetes, metabolic syndrome, polycystic ovary syndrome, liver disease, and many others.

If you carry your extra weight around your waist, what we call the apple shape, you are at higher risk than if you're extra fat is around your hips, called the pear shape.

What causes a person to be overweight or obese? Well, the obvious answer that we always hear about makes common sense: that person eats more calories every day than they burn up. Poor food choices, poor diet, "supersizing" food portions, little or no exercise add up. A lifestyle spent watching a lot of TV, or playing video games, or working on a computer, or at a desk, with little or no walking, much less sport activities leads to obesity.

But is lifestyle the only answer? Is the familiar story of too many calories in and too few burned the only reason for all this overweight and obesity problem? I am going to make clear to you something you probably don't know. Read on….

We have in our body and more specifically in our intestines, what is called the microbiome. The microbiome lives in our gut, the colon, weighs about 3 pounds, and consists of about 130 trillion bacteria – that's 130 followed by 12 zeros. In medicine, the gut is what we also call the colon. Now get ready for a bunch of real surprises: our body is made up of a total of 37 trillion cells, much less than the microbiome. The total surface area of our gut is about the size of a tennis court. There are more nerve cells in the gut than in the spinal cord. And to top off all of this, our gut processes an average of 1 ton of food each year. Yes, that seems like a lot; after all, we have to satisfy the 9,000 taste buds on our tongue! If you think about it, our gut is exposed continually and on a relentless on a daily basis to massive amounts of foreign materials, either beneficial, like nutritional foods and water, or potentially harmful ones, like the pesticides or chemicals on foods, or artificial additives in foods and beverages. To give you another surprise, we humans are made up of 23,000 genes, and the microbiome in our gut is made up of 3.3 million genes. Impressive, isn't it?

Over the last several years, medicine has discovered how important the microbiome is to health, and the United States government a few years ago funded what is called "The Human Microbiome Project" with $173 million dollars. Everyone has a microbiome and everyone's microbiome is unique. Where do we get all these bacteria? When and where did it start? Why are they important to us and our health? Would you be surprised to read it started at birth?

Here is how it all began...

Inside the womb, the fetus gets nutrients, oxygen, and anything that the mother is exposed to. What this last part means is that if the mother drinks alcohol or takes a pill, the fetus will get some too (medications, over-the-counter antacids, etc.) The fetus passes back to the mother carbon dioxide and fetal waste. Then there is birth: mother's water breaks: this water contains lactobacilli, a bacteria, flooding and covering the vaginal birth canal and the upper thighs, the whole area where the newborn is going to come in contact with, giving it an acidic environment, preventing yeast such as Candida and others from growing. The first fluids entering the baby's mouth are mother's microbes. Some of you who have witness a birth know that the baby at birth is covered with a whitish waxy material known as the vernix: this is a protective covering from harmful bacteria.

Right after birth, the baby suckles mother's breast. Mother's first milk is called colostrum: it is a very special milk that contains protective antibodies to guard the newborn against diseases, and it is also rich in proteins and a bacteria called lactobacilli. Remember reading about them from above? These are the same bacteria that were in mother's water when it broke. These bacteria help break down lactose, the major sugar in milk, to nourish the baby. After 2 or 3 days, colostrum changes to normal breast milk, which is high in carbohydrates. One of these carbohydrates is called oligosaccharides, and the newborn cannot digest these: they are to feed the newly forming microbes in the gut. So this is where it all starts. By the time the baby reaches age 3, the microbiome is formed for the rest of its life.

What about Caesarian sections? What if the baby is born via C-section, as it is commonly know? This is an area of concern because C-sections are increasing in the United States, but not elsewhere. Almost one third of babies born in America are by C-section, whereas in Europe it is 4%. Studies have looked at this and basically it is due to three factors. First, planning a birth for a specific date due to work considerations, or around certain holidays, in order to be able to have uninterrupted festivities. Second, if the birth is around a holiday, mothers are wanting to ensure the availability of their obstetrician, rather that whoever is taking call when labor starts. Third, a C-section takes much less time and the doctors and hospitals make more money. But what are the consequences of a C-section? Does it change anything much? Does it affect the microbiome in an unwanted way? The short answer is yes. There is a lack of lactobacilli getting into the newborn as would be if it were a natural birth. The first bacteria in the newborn's mouth are those from mother's skin and hospital personnel, which are different bacteria. Babies delivered this way are up to 80% more likely to develop asthma; they have double the risk for allergy to cow's milk when the time come to give them that; and they have an increased risk for diarrhea and food sensitivities.

So can this have something to do with obesity and chronic inflammation?

According to the Centers of Disease Control, more than 1/3 of American adults are obese: 80 million people. More and more kids have the same problem: 27% of children and adolescents are obese. Mostly it's about eating and slurping too many calories and burning too few, the familiar story of diet and exercise. But what if I told you there was another factor involved? Can you gain weight and get fat from chronic inflammation? Absolutely YES. How is that? Your body makes a hormone called leptin: it tells your body and brain how much fat you are storing. When your leptin levels are up, you don't have much of an appetite, and when they are low, you are hungry. Chronic inflammation blocks leptin from doing its job, and this contributes to obesity, which then leads to diabetes.

What about other factors?

During 2010, the last year we have figures for this, doctors prescribed 258 million doses of antibiotics to patients outside the hospital, meaning antibiotic prescriptions given in medical offices, clinics, emergency rooms, and urgent care centers. There would be even more antibiotic prescriptions if we added the numbers for hospital given antibiotics. Most of these were given to children under the age of 10 and to adults older than 65. And here's the clincher: it is estimated that about half of these prescriptions were not necessary in the first place! That's an awful lot of antibiotics and they all affect the microbiome, and not in a favorable way.

A study performed by the University of Pennsylvania and published in November 2104, looked at the antibiotic prescriptions given to 65,000 children, and showed that before age 2, they got 4 or more prescriptions of antibiotics. The important factor in this study was that this increased their risk for childhood obesity.

And there is more to this: in the section where you read about C-sections, all mothers about to undergo that surgery are given antibiotics intravenously to prevent an infection that might occur during surgery. What about those mothers who deliver their baby naturally? Well they get an antibiotic as well. Why? To prevent an infection in the newborn known as beta Streptococcus, a bacteria that about 25% of all women carry. However, only 1 baby out of every 200 gets sick from beta streptococcus from the mother, but the other 199 still get the antibiotic. So basically, all babies are getting antibiotics when they are born! You would think that by now some company would have developed a screening method with all the technology we have available. And it can't be good to start off life with antibiotics that kill all bacteria, good and bad. By the way, in Sweden, babies do not get any antibiotics and there are no infections. Part of the problem in America is malpractice lawyers make their living suing doctors, making doctors go overboard with unnecessary tests and medications because they are likely to be sued if

anything goes wrong. The fact is that every doctor in the United States is likely to be sued at least once, and probably more than once, during his or her career.

Can you now begin to understand how much antibiotics we are getting starting at birth? All antibiotics affect the microbiome. Remember that antibiotics given to all animals in CAFOs described above? How every time we eat beef or pork we are getting residual antibiotics? And now scientist and doctors are saying this may well be contributing to all the overweight problems and obesity that so many suffer from.

There are a number of investigations and studies pointing a finger at antibiotics. Antibiotics kill bacteria, good and bad.

"It's like a garden—you're less likely to have weeds growing if you have lush vegetation, but without this vegetation the weeds can potentially take over." Studies have shown that when a person takes antibiotics, it can change the stability and diversity of your microbiome, with only partial recovery up to four years later.

Your microbiome is so important that if you suffer from poor gut health, it can lead to leaky gut syndrome, autoimmune diseases, and others, including cancer, heart disease, dementia, and arthritis among others. Not only is our health reliant of the balance of bacteria living in our gut, but also even fertility and longevity can be affected. How does this happen? Remember chronic inflammation? If what we eat, drink, and swallow contains chemicals and toxins, it is going to cause inflammation in our gut as there is where all these end up. These chemicals, antibiotics, and everything else that you have read about change and alter the microbiome, diminishing the good bacteria and allowing bad bacteria to grow instead, causing inflammation. Remember, the good bacteria came from the time of your birth and the first microbes you swallowed were from your mother. This is how your microbiome started. Then you got colostrum for the first 3 or so days of your life, your mother's first milk. Your body accepted these first bacteria from your mother because your mother passed on to you in her womb and through her colostrum her tolerance to these good bacteria. When chemicals or bad bacteria end up in the gut, your immune system will go to work with inflammation. This inflammation then goes through all its steps that were first described above. This includes swelling and dilation of blood vessels. So this swelling makes the colon "leaky", allowing unwanted bacteria to get through into the blood stream, taking inflammation to other organs. And as we continue to eat, drink, and swallow stuff, the inflammation becomes chronic.

What shapes our original microbiome are the foods we eat, what we drink, and our environment. In other words, we help shape our microbiome.

Now that you know the critical importance of the microbiome, let's take a look at what we can do to help it so it doesn't lead to inflammation:

Which foods are inflammatory?

Vegetable oils like corn oil, canola oil, safflower oil, sunflower oil, cottonseed oil, and soybean oil. You have heard about fish oils helping prevent inflammation and heart problems? Those are Omega 3 oils. The vegetable oils above are Omega 6 oils – the exact opposite; these promote inflammation. So don't use any when you cook. Instead, use olive oil or coconut oil. Why? Vegetables oils are gotten from vegetables. These vegetables are GM (genetically modified), and they are sprayed with chemicals, which remain on the crops as residue. Remember, almost 98% of all U.S. crops are GM crops and all are sprayed with Roundup. There is something else as well. Vegetable oils break down into all kinds of nasty chemicals when they are heated. Heat transforms them into the precursors of inflammatory compounds in our bodies called prostaglandins. When you take an over the counter anti-inflammatory drug such as Motrin, or Advil, etc., you are taking a prostaglandin blocker, not allowing prostaglandins to have their inflammatory effect. On the other hand, Omega 3 oils are the opposite of Omega 6 oils: they are anti-inflammatory. These come mainly from cold-water fish, like salmon, and coconuts, which are not sprayed with anything.

Refined carbohydrates such as flour, and grains, including wheat, oats, barley, white bread, pastas, white rice, and biscuits, and sugar. To make matters worse, some of these foods undergo even more processing to make them look and taste good, like cereals in boxes with added sugar, artificial coloring and flavoring. You and your children should put these back on the shelf. There are two main types of refined carbohydrates: sugars, like table sugar, high fructose corn syrup (today mainly labeled as corn syrup and still containing mercury), and refined grains as mentioned in the beginning of this paragraph. These grains have had the fibrous and nutritious parts removed. Refined carbohydrates are turned into sugar by the liver, a normal process. However, as we eat way more refined carbohydrates than we should, this results in increased blood levels of sugars, which in turn raise insulin levels. I go into more detail on this in the section called "SUGAR", and I want to remind you again, that sugar is not a natural product, nor are artificial sweeteners.

Sugar in any form, like those in soft drinks, juices, fruit drinks, pastries, deserts, candies. It is important to note this includes all artificial sweeteners, including corn syrup, and all the pink, blue and yellow packets of artificial sweeteners. Please read a more detailed part in the section "SUGAR".

Trans fats and hydrogenated fats, often used in processed foods and packaged food. According to the FDA, about 95% of all prepared cookies, 80% of frozen vegetables, and 100% of

crackers contain trans fats. These fats don't spoil as easily and can withstand repeated heating without breaking down. This is why McDonald's and Dunkin' Donuts use them from frying French fries and donuts. The way these fats are made is by hydrogenating vegetable oils by a harsh chemical process. You already have read here that vegetable oils are inflammatory, and chemicals cause inflammation, and if you put the two together, well, you have inflammation. Several studies have shown that trans fats and hydrogenated fats are related to heart disease. After many years of sounding the alarm about these fats, the FDA approved having food labels carry a line about the amount of these fats in that food. You can imagine how hard the food lobbyist tried to not have this. New York City became the largest city in the country to require restaurants, cafeterias, and schools to go trans free, and now Boston is following its lead. If this is on the label of some food you picked from a shelf at the supermarket, put it back. This includes margarine, vegetable shortening, and anything that says trans fats or partially hydrogenated oil. You find these also in all fast foods, deep friend foods and commercially baked goods. If you think that by ordering a salad at a fast food joint is preventing anything and not doing any harm, just look at what the salad dressing contains. You should also make your own salad dressings: read what is on the label of most of the dressings on the shelf at your favorite supermarket, unless you shop in grocery stores that sell only organic foods. The U.S. government allows food with less that 0.5 grams of trans fats to say they are trans-fat free, so commercially prepared peanut butter should not be eaten.

Alcohol, especially several drinks.

Milk, even if it is only 2%, is still high in saturated fats.

Meats, if they are raised in feedlots.

Let's flip the coin and let me tell you about foods that lower inflammation and help increase the good bacteria in the gut.

Fresh organic fruits (not juices). These help brain health and prevent cancers by eating 3 or 4 servings a day. I am going to explain why a little later.

Fresh organic vegetables, all kinds. They help lower the risk for heart disease, cancer, Alzheimer's disease, and diabetes. As I have discussed in other parts, we need these as this is what we ate more of ever since the beginning of humankind. You do not want to eat those that are laced with pesticides, herbicides, insecticides and that are genetically modified. You want the real thing, the natural one and you should aim for 4 to 5 servings a day.

Fresh herbs, spices, and teas, including oregano, tumeric, and thyme. Two to three cups of green tea a day keep your brain healthy. Get those that are not from a container, but the kind that are fresh cut in the vegetable section. These will be less likely to have been sprayed with any chemicals, which will trigger inflammation. Tumeric is a natural anti-inflammatory. When you use spices and herbs, you will need less salt for flavor

Wild-caught or line caught fish. Due to the high content of mercury, avoid tuna, swordfish, grouper, orange roughy, tilefish, and marlin. All the rest are fine. You should eat several servings a week. Remember that cold-water fish such as salmon are high in Omega-3s, and so are anti-inflammatory. Mercury, for those of you who may not know it, is highly toxic, especially to the brain, and it will trigger your immune system to do all it can to get rid of it by inflammation. Mercury, along with lead and arsenic, are known as heavy metals. Here is a list of fish that you can eat as you don't have to worry about mercury and they are high in Omega-3s:

- Wild Alaskan Salmon
- Arctic Char
- Sardines
- Sablefish/Black Cod
- Anchovies
- Pacific Halibut

Eggs from cage-free chickens. As you read where I described what happens with animals raised for consumption in CAFOs, chickens were included. The same goes for eggs. Do you want eggs from chickens fed hormones, arsenic, and antibiotics, or do you want eggs from chicken that roam around, pecking and eating naturally? Eggs are an excellent source of protein and are easy to prepare.

Meat: grass-fed, pasture raised, cage-free chicken or turkey, and any wild meat. Yes, wild animals don't eat commercial animal feed. They eat in nature. Grass is what they normally have always eaten. Corn is a crop that in the U.S. is genetically modified and sprayed with Roundup. You don't want that as the feed. Remember that you are what you eat, eats. CAFO's feed these animals all kinds of hormones and antibiotics.

Organic beans and legumes. Two servings daily, especially black beans, black-eyed peas, lentils, chickpeas, amaranth and quinoa. These are high in fiber, help the colon get rid of toxins and help control blood sugar.

Probiotics, either plain Kefir or plain yoghurt. If you get the flavored kind, it will probably have added artificial sweeteners or flavorings, and you don't want those chemicals in any form. Here is a quote from an editorial I wrote for a medical journal this year:

Elie Metchnikoff, winner of the Nobel Prize for Medicine in 1908, was one of the first to realize the benefits of probiotics. In Greek, the word pro means "to promote" and biotic means "life." Metchnikoff 's discoveries brought about the foundations of immunology, especially innate immunity. He observed that Bulgarians living in rural areas in poverty and in harsh climate conditions died at a very old age, attributing that to their consumption of yoghurt. Metchnikoff is credited with having coined the word gerontology and theorized that aging is caused by toxic bacteria in the gut. He concluded that health could be improved and senility delayed by enhancing the microbiome with the bacteria found in sour milk. In the last couple of decades, research has backed this up and has found even more benefits to probiotics.

Red wine. One 5 oz glass daily for women, and 10 oz for men. Why red wine? Red wine, not white, contains resveratrol, and this has been linked to reduced inflammation and prevention of damage to blood vessels. An important fact here is that this is moderate consumption, not a whole bottle or two. Red wine is made by crushing and fermenting dark whole red grapes, and alcohol content ranges from 12-15%. A meta-analysis (remember: this is where they gather all the important studies and publish in a medical journal of what is the ultimate conclusion) was published in 2012 found that resveratrol is a life-extending agent. In another study published in 2013, resveratrol was found to be anti-inflammatory by reducing inflammatory cytokines, in particular tumor necrosis factor alpha and interleukin 6. So, in conclusion, moderate consumption of red wine prolongs your life and reduces inflammation.

Dark chocolate with high cocoa content, a couple of squares a day. The darker the chocolate, the more cocoa it contains. Cocoa is broken down by the bacteria in your gut into anti-inflammatory compounds. Aside from this, it cuts the risk of heart attack because just like aspirin, it prevents the clumping of platelets. Platelets are what cause clots to form: they are necessary in case you get a cut somewhere. Inside arteries, if clumping occurs due to your diet, these clots can cause a heart attack. It can also prevent a stoke for the same reason. This is so important that the National Heart, Lung and Blood Institute has gone into partnership with (are you ready for this?) the Mars company, maker of Mars bars to create a cocoa pill they will study on 18,000 participants over 3 years. We will have the results sometime in 2018. As an interesting fact, in the San Blas Islands of Panama live an indigenous people known as the Kuna Indians. Kuna are unique in that they don't suffer from high blood pressure, diabetes, cancers and heart problems. However, when they move to say, Panama City, Panama, or some other part of the world, they loose this protection against these diseases. Why is this? A study published in 2007 by Harvard researchers showed why: the main beverage of Kuna Indians is cocoa, and they drink it all day long.

HOW TO GET RID OF CHRONIC INFLAMMATION

Chronic inflammation disrupts normal and vital communication between cells. These communicators are known as cytokines, and they have individual names like interleukin-1 and tumor necrosis factor alpha, and others, depending on their function. Cytokines control the communication about inflammation to the rest of the body. Chemicals and microbes activate these cytokines and that starts a cascade of other substances that control inflammation in other parts of the body. This is the reason that chronic inflammation doesn't stay localized in one place but spreads throughout the body. With any imbalance in the immune system, your body overreacts to anything your body sees as foreign, be it microbes or chemical toxins, and that is basically the cause of **chronic inflammation.**

How do you fix this? How do you correct this? Very basically, you reduce the exposure to foreign substances and chemicals. Your great-grandparents and all the generations before them till the beginning of humankind didn't eat what we eat. They ate only organic foods: they had no other choice. The foods they ate were what was growing at that time, in that season, and in the general area they lived in. It was fresh, it had never been frozen, there were no artificial fertilizer used, no pesticides sprayed, nothing: it was all what we today call organic, REAL NATURAL, and there was no colorful label saying "Natural" on it like on some packages at the supermarket. Nowadays organic food is a relatively small section in the supermarket while all the rest is all processed foods, not the real and natural foods that our forbearers ate since time began.

What do you do? How do you go about it? First, you stop eating and drinking inflammatory foods and beverages. What are these? Here are the "dirty dozen":

1. Sugar.
2. Artificial sweeteners.
3. Artificial food colorings.
4. Artificial preservative.
5. Artificial flavorings
6. White flour.
7. White rice.
8. MSG (monosodium glutamate)
9. Gluten
10. Casein
11. Any food or beverage contained in a plastic or can container.
12. High fructose corn

The first 2 are knows inflammatory foods: the packets of artificial sweeteners (saccharin (Sweet' N Low), aspartame (NutraSweet, Equal), sucralose (Splenda) and sugar. These can cause obesity, type 2 diabetes, metabolic syndrome, high blood pressure, cardiovascular disease, migraines, depression, memory loss, and seizures. You don't need a lot of any of theses to start off with chronic inflammation: studies have shown that one soda a day with artificial sweeteners can make you gain weight. This is why the mayor of New York City has banned super sized sodas. What does it have to do with inflammation? Artificial sweeteners are chemicals, and chemicals will trigger the inflammatory mechanism of the immune system. It is much better to use honey instead, and not the kind you buy in the grocery store in the plastic bear, but a natural honey from a beekeeper. Remember when you read about BPA used in plastic containers and that BPA is a hormone disruptor? So no plastic bear filled with honey from a processing plant, just get the kind right from the hive from a beekeeper. Remember how I keep telling you about our ancestors and how they lived and what they ate? Do you think that whoever was your great-great grandma or grandpa, and their parents and grandparents, on back, do you think any of them ate anything out of a plastic container that was made in a food processing plant? Plastics were not developed yet and it is only after World War II that they became part of our lives. Another choice is Stevia, made from a plant, and it has no calories.

Artificial chemical food colorings are made from chemicals, which are foreign to the body, and the immune system will treat them as such with inflammation. At the risk of sounding repetitious, the immune system task is to leave alone all the cells and tissues of our body and attack anything that is foreign to it. Chemicals, including those used to color foods, like yellow number 5 or 6, blue number 1 or 2, red number 3, are foreign to your body. Any artificial chemical, whether it is a food coloring like those used by stores for birthday cakes, or if you were to drink a cup of gasoline, or a glass of paint, these all will cause inflammation as they are foreign to your body. The key is, when we go to a birthday party and eat a piece of cake that has blue, or green, or red, or yellow, this will eventually cause the immune system to mount an attack an get rid of it through your kidneys, sweat, and stools. However, add to this the cola drink along with the cake, and now you have added chemical preservative, chemicals sweeteners, and artificial flavoring to the chemicals in the cake. Now, think of all the foods I have written about up to now, and all the chemicals as well, these are all added cumulatively. Along with all this will be the chronic inflammation, and remember how I mentioned it is silent until something happens, which is when you feel sick, develop diabetes, heart disease, arthritis, etc. This slow and steady environmental exposure to chemicals does it. There are so many chemicals in our foods, unfortunately. Some are worse than others, and there are so many of each, that this book would be thousands of pages long. Other countries require warning labels. For example, in England, McDonald's strawberry sundaes are colored with real strawberries; in America we get a synthetic chemical: Red No. 40. Some supermarkets have banned artificial colorings and chemicals in foods, including Whole Foods Markets and Trader Joe's.

Here are the main culprits in the use of artificial food colorings:

- Kool-aid, Jell-O
- Candies: many: Skittles and M&M candies,
- Gummy bears, lollipops, sprinkles on ice cream, doughnuts, cupcakes, jelly beans, etc.
- Colored drinks (Gatorade for example: blue, red, orange, green)
- Boxed Mac n' cheese
- Pickles
- Cough syrup
- Yoghurts
- Puddings
- Sauces
- Chips
- Soft drinks
- Cereals (for example Fruit Loops, Fruity Cheerios, etc.)

Artificial chemical preservatives are chemicals added to foods or sprayed on them to keep them from discoloration, retard spoiling or to keep bacteria or molds from growing in them. For example, these chemicals prevent fats from going rancid, and give them a longer shelf life, so that these foods can stay on store shelves for months and months and then for weeks in your kitchen cabinets. The government calls these chemicals "food additives". They can be found in many foods, including cereals and fruit juices (the kind kids like to drink). Processed meats, including ham, sausage and bacon, contain preservatives so their color doesn't turn gray. Nearly every food that comes in a can, box, or pouch contains artificial preservatives. According to the FDA, trying to eat foods that don't contain artificial preservatives is almost impossible for the average American, unless you know about them.

Artificial chemical flavorings are chemicals that give a certain flavor to foods; you may have seen the large plastic bottles at the snow cone stand from which orange, grape, raspberry flavors are added to the shaved ice; another example of artificial chemical flavorings are buttered popcorn and Folgers Flavors for coffee. These chemicals also give foods flavor that their processing has removed. You will see labels with "natural" or "artificial" flavors, the difference being that natural flavors come from animals or plants before being chemically processed, and artificial coming from a only a chemical like petroleum and others.

White flour, also known as enriched flour, is really not enriched. All the good in it has been removed by refining it, so it is a refined carbohydrate. This means that instead of being absorbed by the body as wheat or grain, it is a starch, which the body turns into sugar! Also, why do think it's white? It's because it is bleached using chlorine, bromates, and peroxides. White flour is banned in Europe. It is better to use any gluten-free type of flour.

The story with **white rice** is the same: white rice has been refined, so it is a refined carbohydrate, whereas brown rice is a whole grain, and much better for you. White rice has most of the vitamins in it destroyed by refining. Some may say that since white rice is eaten in Japan and people in that country are slender and live long, why can't we eat pizza and Doritos? Japanese use a different type of rice than the hybrid rice we use here, and they don't spray rice paddies with chemicals. First, they wash to remove excess starch, then they soak it for an hour or two in water, and they steam the rice.

MSG: monosodium glutamate is a **chemical** used as a flavor enhancer, and the FDA says it is generally safe, although in Europe it is classified as a chemical food additive and limits its use and amounts in food. Not here in the U.S. though. You can find MSG in Doritos, KFC fried chicken, Chick-Fil-A chicken sandwiches, potato chips, cold cuts (including the pepperoni on your pizza), salad dressings, many salty snacks, in a lot of Asian foods, chicken broth, frozen dinners, bacon bits, and so on.

What is **gluten?** It is a protein found in wheat, rye, barley and triticale. There are people who cannot tolerate any gluten in their diet as they have celiac disease. There is a specific blood test to know if you do or do not have celiac disease, and it applies to children as well. Any food or beverage with gluten will damage the intestinal tract of any person with celiac disease, cause abdominal pain, and when untreated, it can lead to autoimmune disorders like type I diabetes and multiple sclerosis, anemia, migraines, intestinal cancers, and other serious problems. A lot of other people are gluten sensitive, for which there is no test, but these folks develop "foggy brain", depression, abdominal pain, bloating, diarrhea, headaches, joint and muscle aches and pains, chronic fatigue, and vitamin deficiencies. Both celiac disease and gluten sensitivity people cannot tolerate gluten. Gluten is inflammatory, mainly because of the wheat we now

grow in America has been genetically modified (GM) and is a hybrid of normal wheat, meaning it is no longer natural. Remember that all our crops, including wheat, are sprayed copiously with Roundup, the commercial name for the chemical glyphosate, and as I have explained to you, chemicals cause inflammation. However, if you travel to other countries, and say you have a cup of coffee with a baguette in Paris, there is nothing to worry about, and they don't have GM foods and Roundup is banned. Remember what you read about GM foods from above? Foods that contain **gluten** include:

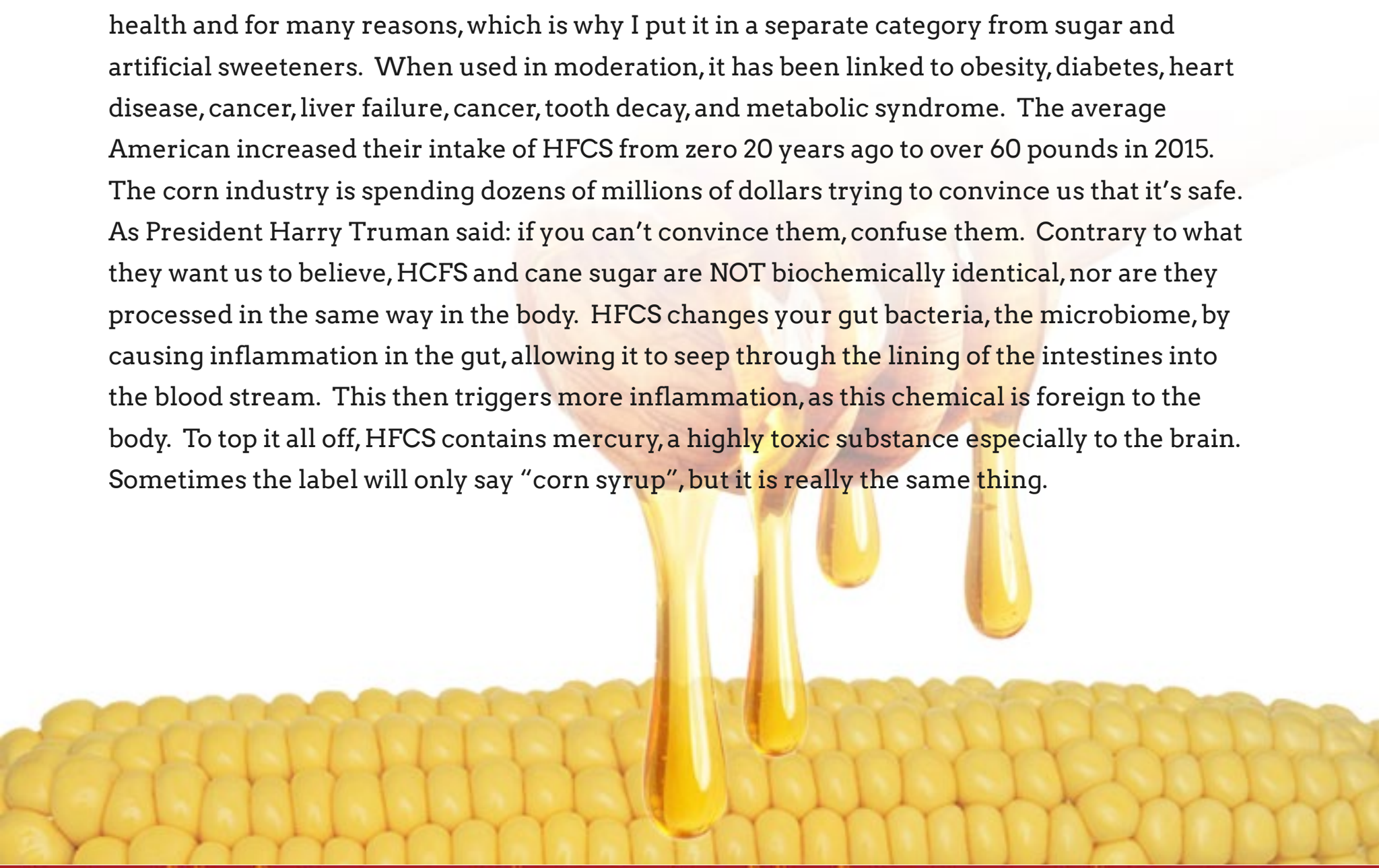
- Pastas
- Noodles
- Breads
- Pastries
- Crackers
- Baked foods, including cookies, piecrusts, brownies
- Cereals
- Granola
- Pancakes, waffles, French toast, crepes
- Breading (breadcrumbs)
- Flour tortillas
- Croutons, including stuffings
- Sauces and gravies
- Soy sauce
- Beer, ale, lager
- Malt, including malt vinegar
- Brewer's yeast

Casein is a protein found in milk, yoghurt, kefir, sour cream, butter, cream, ice cream, and cheeses. Dr. Colin T. Campbell (no relationship) who wrote the famous book "The China Study" found casein to be a cancer promoter. Symptoms include swelling of the lips, wheezing, vomiting, and hives. Some people develop diarrhea, bloating, abdominal pains, joint pain, fatigue, and mood changes. This is not related to lactose intolerance, which is when a person lacks a specific enzyme to digest dairy products. Dr. Kelly Brogan, a brilliant psychiatrist (I am honored to call her a friend) found that by removing gluten (described previously) and casein from their diet, patients who are schizophrenic, bipolar and who suffer from depressive symptoms improve. The reason is that these disorders are due to inflammation. The immune activating and inflammatory proteins found in wheat and dairy products, mainly because wheat is one of the most processed foods in our diet, almost always used as flour, prepared with sugar (read the label of store bought bread and you will see they all contain sugar) and with genetically modified vegetable oils which I went over in a previous section. Dairy, is

homogenized and pasteurized, contains hormones, creating distorted fats, a denatured protein called casein and completely destroyed vitamins.

Why avoid ***plastic containers***, the kind most soft drinks are bottled in, water bottles, and a whole long list of liquids, such as cooking oils, salad dressings, mustard and ketchup, etc. come in? It's because the plastic contains BPA, or bisphenol-A, which makes the plastic clear and tough. The problem with BPA is that it is toxic to the brain (neurotoxic), and it is a hormone disruptor, meaning it interferes and derails hormones, causing developmental disorders in children, obesity, reproductive problems, including infertility, thyroid diseases, diabetes, and others. More that 2 million American women are infertile, and 7 million see infertility specialists; 20 million Americans are suffering from thyroid diseases, and 29 million have diabetes, and BPA could triggering part of this vast problem. The lining in canned foods contain BPA so that the food doesn't stick to the inside of the can. A study done at Harvard and published in 2011 took a two groups of people: one group got one 12 ounce portion of canned vegetable soup a day for 5 days while the other group got the same amount of fresh vegetable soup made without any canned ingredients. After only 5 days, the group eating canned soup had a 1,200% increase in BPA in their urine! Do everything you can to avoid plastic containers and canned foods!

High fructose corn syrup (HFCS) is an artificial sweetener that really goes against your health and for many reasons, which is why I put it in a separate category from sugar and artificial sweeteners. When used in moderation, it has been linked to obesity, diabetes, heart disease, cancer, liver failure, cancer, tooth decay, and metabolic syndrome. The average American increased their intake of HFCS from zero 20 years ago to over 60 pounds in 2015. The corn industry is spending dozens of millions of dollars trying to convince us that it's safe. As President Harry Truman said: if you can't convince them, confuse them. Contrary to what they want us to believe, HCFS and cane sugar are NOT biochemically identical, nor are they processed in the same way in the body. HFCS changes your gut bacteria, the microbiome, by causing inflammation in the gut, allowing it to seep through the lining of the intestines into the blood stream. This then triggers more inflammation, as this chemical is foreign to the body. To top it all off, HFCS contains mercury, a highly toxic substance especially to the brain. Sometimes the label will only say "corn syrup", but it is really the same thing.



A lot of foods contain this harmful chemical:

- A&W Root Beer
- Capri Sun juices
- Soft drinks
- Snapples
- Breads
- Most Kellogg's breakfast cereals
- Lifesavers
- Ketchup
- Mayonnaise
- Pop-tarts
- Many Nabisco snacks
- Nutri-Grain cereals
- Cough syrups
- Cool Whip
- Yoplait yoghurts
- Ice creams (Ben & Jerry's, Dreyer's)
- Jellies and Jams
- Salad dressings
- Steak and BBQ sauces
- Most Lunchables

A special mention: ***Propylene Glycol***

You will see this on the label of many foods, but is a synthetic chemical, used to make polyester compounds, to make antifreeze for cars and trucks, and is used in the plastic and paint industries. It is also used in most cosmetics. Propylene glycol has been linked to cancer, fertility problems, allergies, brain toxicity, and disrupts your hormones. However, the FDA says it is "generally accepted as safe" for all of us to eat, and this includes children. Again, this is a chemical and will trigger the immune system to bring in inflammation.

So please read the label on any foods you eat, and if it contains any of the above, put it back, don't buy it, and please don't eat it, drink it, or swallow it.

For all the reasons I have explained above, avoid all of these as much as you can. Yes, you may not be eating your favorite dishes anymore, or drinking your favorite soft drink, but you will be much healthier, and more importantly, you will feel much better after a few weeks. Just as important, you will be preventing chronic diseases. This is not something you start one day and feel well the next. This is for the rest of your life. If you want to follow a particular diet, the best

one by far as discussed in numerous studies by prestigious medical and scientific institutions is the Mediterranean Diet. Your other choice is a low carbohydrate diet. Buy organic and forget the quick meals in the microwave. It may not be practical, but then neither are illness, disease, and sickness. How practical is taking pills, going to the doctor, and not feeling as well as you could feel? And I recommend you take supplements, as described further on.

Eat a Mediterranean-style diet. These are inflammation-fighting foods that include fruits, green leafy vegetables, olive oil, tomatoes, and fish: a very simple diet. These are all part of the Mediterranean diet. However, eating one—or even all—of these foods may not help if you're also eating sugar, refined carbohydrates such as product made with flour, and red meats.

THE MEDITERRANEAN DIET

The Mayo Clinic has done research into the Mediterranean Diet and in an analysis of more than 1.5 million adult Americans; this diet demonstrated a reduced risk of death from heart disease and cancer, as well as a reduction of Parkinson's disease and Alzheimer's disease. Well, that is quite an accomplishment, no one can argue with that.

A few years ago, I read an article in a medical journal about a 45 year-old man in Chicago who went to see his doctor for some nagging symptoms. After a number of tests the results were not good: cancer. The patient, who had emigrated from Greece as a child, consulted a cancer specialist. He was told that the cancer was very aggressive, and that he would be dead in under a year. The man started checking into funeral costs, and decided to return to his home island in Greece as the funeral expenses there were much, much lower, and at least he could see his relatives and family friends one last time. He was interviewed 40 years later, when he was in his 80's. His cancer was gone, and he was, in his own words, "doing well"; both his regular doctor and cancer specialists were deceased. It was decided to study this patient and what had changed in his life to erase the cancer and make him healthy. His life was put under a microscope: what time did he wake up, go to bed, what did he eat for breakfast, lunch and dinner, what did he snack on, what did he drink, what did he do during his waking hours, what were his bowel habits, and so on.

The results were quite revealing. There were 4 important points made. First, he visited or had friends visit him every day, sometimes for a meal, or sometimes just for coffee. Second, he walked wherever he had to go, as he had no other form of transportation. He lived on a hill, and went down into town every other day to buy food, and walked back up the hill: the distance was about ¾ of a mile each way. Third, he had one glass of wine every evening, either white or red, but when he ate with others for an evening meal, he would have two (Greeks have been making wine for 6,500 years!). Lastly was his diet: it consisted mainly of a variety of fresh vegetables,

lentils, beans, and fresh fruits, which is why he went to the marketplace in town every other day; he used olive oil for salad dressings and cooking – no butter; he used fresh herbs from his yard for flavoring foods; he ate an egg every morning for breakfast and had coffee – no cream or sugar; during the week he would eat either chicken or fish; he also would munch on nuts whenever he was a little hungry or have a yoghurt; he ate bread from the local bakery which he bought fresh every other day; he had goat or lamb only on special occasions, and a few times a year he would eat beef when invited to the home of friends. He went to bed around 9 in the evening and woke up at about 5 every morning.

The message here is clear: do things with friends (a TV show or video games are not a replacement for having friends); walk more; have a glass of wine while you watch the sun set; and eat less meat and no processed foods. I invite you to learn from what you read here about what you eat. This may surprise some of you, but sugar is not a natural food; it is processed food. Milk products, in the United States, including yoghurt, have hormones and other chemicals added into them. The wheat, corn, soy, and other crops used for food in America is not the wheat, corn, soy, etc., your parents, grandparents, and on down your ancestry ate: it is a hybrid of that wheat and it is genetically modified so it can be sprayed over and over with America's most popular herbicide: Roundup. Artificial sweeteners are very low calorie, but are known to cause obesity and diabetes. There was no supermarket with frozen foods, packaged baked goods, foods laced with chemicals to make them taste yummy on this Greek island. This man ate like all his ancestors ate, got rid of his cancer, and was still hale and hearty in his 80's. The message here is: don't you want the same for yourself?

Practice good hygiene. You don't have to be squeaky clean or use antimicrobial soap or that gel you see on counter everywhere and at the entrance of supermarkets. Overusing antibacterial soaps and gels can upset the delicate bacterial balance on your skin and then you end up with antibiotic-resistant bacteria. Do wash your hands before you prepare meals and after you use the toilet. Brushing and flossing your teeth after meals is also a good way to keep decay-causing bacteria that damage your teeth and gums.

Ladies: Don't douche. Douching gets rid of colonies of Lactobacillus bacteria in the vagina, making it vulnerable to infection by yeast or other bacteria.

Take antibiotics but only when needed. Antibiotics can't tell helpful bacteria from harmful bacteria—they attack all bacteria. In the process, you loose a lot of good bacteria

WHAT YOU SHOULD DO DAILY:

Water

You have to drink water, and a lot more than you now normally do: 3 quarts a day. You need water to maintain your body temperature, lubricate your joints, and keep your stools from getting hard and to keep healthy. You lose water every time you use the bathroom, when you sweat (and we all sweat, in winter too), and even when you breathe. It's critical for heart health, making it easier to pump blood and helps your muscles work efficiently.

Oil

For cooking use either extra virgin olive oil or coconut oil. For making salad dressing, etc. either one is fine, as I have described in another section.

Yoghurt Of Kefir

Don't buy the one with fruit at the bottom, as they contain artificial chemical colorings, artificial chemical flavorings and artificial chemical sweeteners. Use plain yoghurt with real live cultures. Kefir is even better: ½ cup of either one is all you really need. You should also eat either a couple of tablespoons of kimchi or sauerkraut a few times a week: this will help your microbiome as well.

Fruit Juices

Don't drink these. They are loaded with sugar, some artificial like High Fructose Corn Syrup, although the label may read Corn Syrup. It is much better to eat fresh fruit. A 12-ounce serving of apple juice contains 10 teaspoons of sugar. Think about it. When you drink a large glass of orange juice, it is the same as eating several oranges one after the other without the benefit of all the fiber. What you got in the juice is 8 teaspoons of sugar, and if it is grape juice, you are drinking down 15 teaspoons of sugar.

Soft Drinks

These are not good for you. They contain chemicals: artificial flavorings, artificial colorings, artificial preservatives (so they can sit on a shelf for a long time) and artificial sweeteners. And they are sugar bombs.

Let's just look at the sugar content:

12 ounce can of Coke: 10 teaspoons of sugar
20-ounce bottle of Coke: 17 teaspoons of sugar
1 liter bottle of Coke: 28 teaspoons of sugar
20-ounce bottle of Mountain Dew: 20 teaspoons of sugar
1 liter bottle of Mountain Dew: 31 teaspoons of sugar
20-ounce bottle of Vitamin Water, B-Relaxed Jackfruit and Guava Flavor: 8 teaspoons of sugar
20 ounce Sobe Mango Melon: 18 teaspoons of sugar
24 ounce can of Arizona Lemon Ice Tea: 18 teaspoons of sugar
16-ounce Snapple Lemon Iced Tea: 15 teaspoons of sugar
20-ounce Minute Maid Lemonade: 17 teaspoons of sugar
16-ounce bottle of Minute Maid Orange Juice: 12 teaspoons of sugar
16-ounce bottle of Nesquik Chocolate Milk: 15 teaspoons of sugar

Do you think you need that much sugar? Do you understand why there is obesity, diabetes, and all the rest of the problems we have been discussing?

SUPPLEMENTS

There is a lot of confusion in the general public about supplements. For optimum health, you really absolutely need supplements, as most of our diet does not provide all the nutrients and vitamins that we need. Up to 90% percent of Americans are deficient in one or more essential nutrients. Vitamins and minerals are essential for our bodies and help us function well. Without them, we go on, but not at our best level. Remember, supplements work over a period of time; they are not a quick fix. It takes about two months for them to reach the levels they need in your body to be able to benefit you. Some people will quit because they don't feel any better, but that is the wrong attitude. Remember, you need to implement all of the above as well as take supplements: one is not a substitute for the other. And your health will improve, and your doctor will be surprised the next time he does an routine blood test on you, and you will be healthier, and you will be preventing chronic diseases.

Here are the **10 vitamins and supplements** I recommend you take daily. You can skip the last 2 if you drink a glass of red wine daily and eat fish 3-4 times a week from the list I gave you.

Acetyl-L-Carnitine, 400 mg per day.
This amino acid is a cell energizer. It also helps all your nerves and your brain, including memory.

Magnesium: 500-1,000mg/day.
This is essential for the normal function of your body. Over 300 enzyme reactions need magnesium, including the main source of energy for all cells. It promotes normal nerve and muscle cell function, normal blood pressure, normal heart rhythm, and normal function of the immune system.

Vitamin D3: 5,000 IU/day.
Vitamin D helps cell growth, nerves and muscles, the immune system, and helps reduce inflammation. It keeps bones from becoming brittle.

Vitamin C: 1,000 to 2,000mg/day.
This reduces uric acid, which causes gout, lowers the bad kind of cholesterol, helps with heart failure, and helps children and adolescents with depression.

Coenzyme Q10: 100 to 150mg/day.
This is the energizer for all the cells in your body, and especially your muscles, in particular your heart muscle. It also helps people with cancers.

Zinc: 25mg/day.
Zinc is essential for the immune system and for skin health. It is part of over 200 enzyme reactions in the body, and is necessary for wound healing.

Curcumin: 1,000 mg per day (don't take this if you have gallstones).
Tumeric is a spice from which curcumin is derived from. Curcumin is a very powerful anti-inflammatory, helps prevent cancers, reduces plaques in arteries, reduces the risk for diabetes, and is heart healthy.

Vitamin B complex: one daily.
This is your brain vitamin, helps you stay sharp, prevents cardiovascular disease, vision loss, and boosts your energy.

Omega-3 (fish oil): 3,000mg/day at least.
Omega-3 is essential for reducing inflammation, helping with cholesterol and triglycerides, your brain, including those suffering from memory loss or Parkinson, autoimmune diseases, and depression. Omega-6 is inflammatory, so stick to Omega-3. If you eat the fish I recommended to you before 3 or 4 times a week, you don't need to take this.

Resveratrol: 200 mg per day of trans-resveratrol.
Resveratrol helps protect against heart disease and cancer. It also helps in diabetes and Alzheimer's disease. Instead of a pill you can have a glass of red wine a day.

EATING OUT

Most of us eat out at times, some of us at least a couple of times a week, others less regularly. What I mean here is grabbing a sandwich at the deli counter for lunch, having a sit-down dinner at a restaurant, or picking up take-out. These meals make it more difficult to watch portions, what ingredients are used, and calories, especially if you are doing what you can to reduce chronic inflammation in your life. Here are my recommendations for how to be able to enjoy your food from deli counters and restaurants without giving up you're the goals you have set for yourself.

If you are seated in a restaurant, ask the waiter how what you are ordering is prepared and what ingredients are included. Make sure you let him or her know you don't want any MSG in your food. If you are going to eat meat, skip anything that is fried, and that goes for potatoes and anything else that's fried. Instead, choose a meat that has be baked, grilled, or broiled, and tell the waiter you don't want any heavy sauces; it is better to skip them as this is where chemical food additives and calories are hidden. You can order an extra side of non-starchy vegetables like green beans, asparagus, summer squash or broccoli. These will help fill you up and are low in calories.

When you get your meal, use your eyes to measure what you will eat now and what you are going to take home. You can easily get two meals, one to eat right then at the restaurant, then one for lunch the next day with what is left over. Here is a great way to reckon what is on your plate:

Your palm: 3 ounces of meat, poultry, or fish.

A handful: one ounce.

Your fist: one cup of pasta or vegetables.

Your finger: one ounce of cheese.

Your thumb tip: one teaspoon.

EXERCISE: HOW TO DO IT SO YOU WILL ACTUALLY DO IT.

This is not the intense, several hours a day, join a gym, and jog in any kind of weather type. It is the kind that will lower your risk for chronic inflammation, and reducing your risk for chronic problems like high blood pressure, stroke, heart attack, diabetes, arthritis, and many others. Not only that, it will lower your cholesterol, especially the bad kind (LDL), it will raise it will help you relax and manage stress better.

The most important part is that this be done regularly. In a full day there are 24 hours; surely you can do some form of exercise for 30 minutes a day. It can be taking the dog for a 15 minute walk twice a day, it can be bicycling, swimming, dancing, paddling, rowing, tennis, raking leaves, and many such activities. The key is to do that every day, to make it a habit. Make this part of your life.

CONCLUSION

You probably know people who have heart issues, or diabetes, or pain problems. And now you know what can cause all these chronic problems and what steps you can take to improve your health and get rid of this terrible factor called chronic inflammation. I wish the best of health for you, as I am here to help you not only get rid of diseases and health problems, but also to help prevent them.

May you be happy,
May your body be strong,
May your life unfold with ease.

Andrew W. Campbell, M.D.

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