

Voltage: The Key to Rebuilding Your Health

“The key to making chronic disease better is making a single cell work. If you give the body the things a single cell needs to work, the body often has the power to heal all of the cells of the body. That means you get well!”

--Dr. Jerry Tennant

In the mid-1990s Dr. Jerry Tennant was one of the top three ophthalmic surgeons in the world. Then, in a matter of months, his career was ended by a mystery ailment that left him disabled and barely clinging to life.

A pioneer in lasik surgery, Dr. Tennant was responsible for most of the research done on the excimer laser for VISX. He also performed over 1,000 lasik operations in the United States and about 2,000 cases abroad. These surgeries actually contributed to his decline in health. In the early days of lasik operations, it was believed that ordinary surgical masks were sufficient to protect doctors from contamination. Nobody suspected that viruses existing in a patient's eyes could possibly harm the surgeon. But each time Dr. Tennant performed a lasik procedure on a patient, the laser would strike the eye and release viruses that drifted upward through his mask and into his nose and brain. In time he developed encephalitis and a bleeding disorder that manifested as spastic movements and an inability to remember even how to write a prescription. Diagnostic tests confirmed he had three viruses in his brain, but no one knew how to treat them. Dr. Tennant's physicians told him there was nothing that could be done to help him. So, on November 30, 1995, he was forced to retire.

He spent almost seven years in a fog that rarely lifted. Too fatigued to function on any level, Dr. Tennant slept about 16 hours each day. During the two to three hours per day when he could think, he read books or newspapers until, like a light switch, his brain would turn off and he would no longer be able to understand what he was reading.

With his waking/thinking time severely limited, Dr. Tennant gradually began to realize that if he was going to get well, it was up to him to find a way since modern American medicine had no answers. So he started reading cellular biology books. As his knowledge grew, so did his belief in the importance of learning how to get a single cell to work correctly. If he could do that, in time, all of his cells would work correctly.

Each of the cellular biology books he read gave passing reference to the fact that cells function in a narrow range of pH, but said little more. Dr. Tennant began to look closely at pH. He came to realize that in addition to acidity and alkalinity, pH measures the voltage in a solution. Voltage. Could this be the key he was searching for? Gradually, Dr. Tennant began to understand that cells must have enough voltage to work and that chronic disease is associated with loss of voltage. His next step was to find out how to

measure the voltage and keep it at optimal levels. Following this path, he was finally able to heal himself.

This booklet outlines some of Dr. Tennant's most important discoveries about rebuilding and maintaining good health.

Dr. Tennant's Principles

- The body doesn't get well by making damaged cells work correctly. It gets well by making *new* cells that work correctly.
- The process of rebuilding a new and healthy *you* is based on the fact that the body is constantly replacing itself. Your body grows new retinal elements every two days, new skin in six weeks, a new liver in eight weeks, new nerve cells in a period of months. As each new cell is built, the body seeks proper building materials from which to construct the cell. If the body cannot find good, healthy materials, it will use whatever is available.
- To make new cells, the body must have raw materials (nutrition) and sufficient cellular energy to use the materials. If any of these are lacking, pharmaceuticals and/or surgeries will not help.
- Human cells are designed to run at about -20 millivolts (or pH of 7.35). The body has the ability to heal itself of many ailments if it is supplied with sound nutrition and proper cellular energy.

How Do Healthy Cells Work?

Our bodies are made up of trillions of cells. While they are all specialized according to the work they do, they all have the same basic structures. On the outside is a flexible membrane that encloses and protects the cell's contents. It also regulates what moves into and out of the cell and maintains the cell's electric potential, which is essential to its ability to do the work required.

Inside the cell are at least one nucleus and some cytoplasm, a jellylike substance that consists mostly of water and dissolved proteins. The nucleus acts as a control center for the cell, while the cytoplasm is home to many different structures called organelles (little organs). Each of the organelles plays a different role. The ones we are most concerned with are the mitochondria, which function as the **power stations** of the cell. The number of mitochondria varies for different types of cells, but under optimal circumstances up to hundreds of mitochondria can exist in a single cell. Because cells need energy for everything they do, the importance of mitochondria cannot be overemphasized.

Cell Membranes, Mitochondria: Capacitors and Rechargeable Batteries

Cell membranes are made up of opposing pairs of phospholipids, a specialized type of fat, and loose proteins. Each phospholipid molecule has a ball on one end that works as an electron conductor and two legs that work as electron insulators. These conductors and

insulators form a capacitor whose purpose is to store electrons. In effect, the membrane functions as a small battery that stores voltage for the cell.

All of the energy generated for the use of a cell occurs within the mitochondria via a type of rechargeable battery system known as ATP/ADP. ATP exists when the battery is charged and ready for work. As energy is spent, the battery becomes ADP. Recharging takes place as electrons are brought in from the cell membrane and mixed with a small amount of phosphorus. This process takes place approximately 70 times per day in every cell in the body. If the ATP/ADP system is not functioning properly, cells cannot generate the power they need to keep the body working. In addition, when the number of mitochondria that are supposed to be functioning in a cell is reduced for any reason, the cell's ability to provide for its own energy needs is diminished.

The body moves electrons into cells 3 ways:

- Ionically through the circulatory system
- Through the fibrous sheath surrounding the nerves
- Through the acupuncture (fascial) system

Energize Your Healing Process

Chronic disease is associated with a lack of cellular energy. This is one of the key reasons why traditional Western medicine has been unsuccessful in finding cures for so many of today's most common health problems. Pharmaceuticals help only in alleviating some of the symptoms, not in providing genuine long-term cures. In fact, bad reactions to pharmaceuticals are the leading cause of death in the U.S. All drugs have side effects that range anywhere from annoying to life-threatening—just listen to some of the drug advertisements on television if you want to confirm this.

Physicians have always known that, given time and the right conditions, the body has the ability to cure itself of many—if not, most—diseases. A healthy diet, exercise, and adequate rest go a long way toward curing many problems. But once a chronic disease has established itself, these basic things may not be enough. The body may need to increase the amount of energy in its cells so the cells can do the work they were designed to do. With adequate energy, the effects of a healthy diet, exercise, and rest are magnified throughout the body.

So how do we increase the amount of energy available to our cells? We have already given a brief overview of the way power or energy works in a cell. Now let's take a look at the conditions that enable our "batteries" to work at higher levels of efficiency.

Electrons can be obtained from many sources, including:

- The Tennant Biomodulator®
- Unprocessed foods
- Green leafy vegetables
- Alkaline water
- Dark chocolate
- Sunshine
- Working or standing in soil
- Fresh air, wind, etc.

Taking advantage of these resources helps your body to create a pool of electrons.

Put the Power of pH To Work for You

Because the human body is 75% water, solutions are always in play in our bodies. In fact, much of the transfer of voltage occurs ionically or via fluids. It is important to realize that fluid solutions can either carry additional electrons, making them electron donors, or remove electrons, making them electron stealers.

Remember, electrons are necessary for cells to perform their work. Removing electrons is counterproductive. In fact, free radicals are molecules that are missing electrons and looking to steal them from other molecules. This makes them unstable and dangerous. Free radicals create cellular chaos that can lead to a vast array of problems. On the other hand, antioxidants are electron donors. That's why antioxidant foods are so important for good health. When a mother tells her children to eat their broccoli, she is actually telling them to consume antioxidants or electron donors.

We can learn whether a solution is an electron donor or an electron stealer by measuring its pH. If a solution is alkaline, it is an electron donor. If it is acidic, it is an electron stealer. The pH scale measures how acidic or alkaline a solution is. It ranges from 0 to 14, with 7 being considered neutral. As you move down the scale from 7, you get a solution that is increasingly acidic (6 is acidic, 5 is even more acidic, etc.). Moving up the scale from 8 to 14 represents increasing alkalinity (8 is alkaline, 9 is more alkaline than 8, etc.). Science has long known that healthy people have an alkaline pH and that, in fact, the human body operates best when the pH is approximately 7.2 to 7.35. Chronic disease and pain are almost always associated with an acidic pH.

Oxygen and Voltage

Without oxygen, the body—and all of its cells—can't work. As oxygen levels decrease, so does health. In 1966 Otto Warburg, one of the twentieth century's leading cell biologists, received a Nobel Prize for discovering that cancer cannot grow when normal oxygen levels are present.

The amount of oxygen in cells is determined by voltage. If a cell has adequate voltage, it will also have adequate oxygen. If cellular voltage is low, the amount of oxygen in the tissues will be low. This applies to metabolism as well. When voltage and oxygen are low, metabolism becomes anaerobic, which means that oxygen is unavailable. Anaerobic metabolism is very inefficient.

The Bohr Effect and Hyperbaric Oxygen Treatments

The Bohr Effect states that the amount of oxygen that will dissolve in a solution is dictated by the amount of voltage in the solution. Remember, the human body is 75 percent water, which means this is a key fact for health. As voltage drops, less oxygen can be dissolved into cells. In some cases, hyperbaric oxygen treatments are used to increase oxygen levels in tissues. As oxygen levels rise, so does voltage. When voltage is normal, oxygen can enter cells automatically as needed.

In addition to acidity and alkalinity, pH also refers to voltage, but the scale in this case ranges from -400 to +400 millivolts, with 0 in the middle. Moving down the scale from 0 into the negative range indicates increasing levels of health, while moving up the scale into the positive range indicates increasing dysfunction. Healthy adults normally measure -20 millivolts (mv) of energy, which translates to a pH of 7.35. Children, young adults, and athletes commonly measure -30 mv of energy. Problems occur when a body's voltage drops below the necessary operating level of -20 mv. Thus, at -15 mv, a person is tired. At -10 mv, he/she is sick. At -5 mv organs are no longer able to function properly. Problems resulting from continued drops in voltage include chronic pain, a decrease in oxygen levels, and infections. (*Note: Infections continue to increase damage by feeding on healthy cells.*) Remember, moving up this scale into the positive range increases vulnerability to illness. At +30 mv, the cellular electrical system malfunctions, reversing cellular polarity (the way electricity is conducted through cells). Damage also occurs to DNA, and cancer is able to gain a foothold in the body and grow.

Why Do Cells Lose ATP/ADP Power?

The most common reasons for a loss of ATP/ADP power include the cell membrane losing its ability to store electrons and/or a depletion of the number of functioning mitochondria. These conditions can be brought about by:

1. Consuming trans or "plastic" fats, which destroy the cell membrane
2. Hypothyroidism, which reduces the number of mitochondria in cells
3. Heavy metals such as lead, mercury, and cadmium
4. Dental infections from decay in teeth, root canals, and in jaw bones
5. Toxins

1. Trans Fats: Dangerous Plastics That Destroy Health

Many years ago food manufacturers recognized that they were losing significant profits because their products were spoiling. In response, they did two things: They added chemicals to foods to keep them from spoiling, and they began to cook fats for long periods of time to stabilize them. The chemicals, we now know, are problematic for the health of the person consuming them. The fats are, too, because the very long cooking process changes them from a healthy substance into something that is only one carbon atom away from plastic, and that has a profound influence on the structure of cell membranes.

It works like this. When a cell wears out, your body makes a new one. First it looks around to see what building materials are available to make the new cell. If all you have given your body is "plastic" fat (partially hydrogenated or trans fats), the new cell membrane will be made from plastic. The result is sort of like wrapping individual cells in cellophane. A healthy cell membrane is designed to allow certain things to go into and out of the cell. It can't function properly when the membrane is made of cellophane.

Imagine that one of your cells sends a message to your brain telling it that it is hungry. Your body will respond by sending the cell some glucose and insulin.

What happens when the glucose can't get through the cellophane? The cell keeps on complaining that it's hungry, and your body keeps on sending it more insulin and glucose. Much of the insulin and glucose will be put into fat cells. But the original cell will continue to complain that it is hungry, and your brain will continue to make you want to eat so that you can try to resolve the hunger issues (*see "Beware of MSG" on page 8 for additional information on hunger*). Even so, very little glucose will get through the cellophane into your cells.

In time you will become obese and your pancreas will wear out from making so much insulin. With all that glucose in your bloodstream, you will be diagnosed with type 2 diabetes. Drugs can be prescribed to lower the levels of sugar in your bloodstream, but your cells will still be coping with the effects of being made out of plastic. Eventually they will begin to wear out and you will get symptoms of worn out cells: heart attacks, strokes, liver failure, kidney failure, blindness, chronic fatigue, etc.

Obviously, if you want to get well you must stop consuming plastic fats. In today's world this

Saturated Fats and Omegas

Many people are confused about the best types of fat to eat. As a result, there has been an increase in the numbers of people who are becoming toxic as a result of consuming too many Omega-3 fats (from fish oil, etc.). It might help to think of your cell membranes as if they were your home. They need to be strong enough to be substantial, but they also need doorways and windows to let things in and out. If you build your house out of concrete blocks with no windows or doors, it will be strong, but there won't be any way to get in or out. If you build it mostly with doors and windows, the next storm will blow it down.

In cells, saturated fats are strong and unsaturated fats are porous, which means they have openings. You need saturated fats (i.e., animal fats) to make your cells strong, and unsaturated fats (i.e., fish oil) for doors and windows. ***To make perfect cell membranes, you should eat four times as many saturated fats as Omega-6s and -9s, and four times as many Omega-6s and -9s as Omega-3s.***

Suggested saturated fats (concrete blocks): coconut oil, palm oil, beef, mutton, butter, cocoa, lard, eggs, etc. (*Note: Do not eat or cook with margarine.*)

Suggested Omega-6s and -9s (doors): safflower oil, olive oil, sesame oil, rice, butter, corn, sunflower oil, oats, peanuts, etc.

Suggested Omega-3s (windows): flax and fish oil (fish oil has much more energy than flax oil).

is easier said than done. Even if you change the fats you use at home, most restaurants use plastic fats for frying foods. If you eat out, you must stop eating fried foods or choose a restaurant that you know doesn't use plastic fats. Most cheese is also made from plastic fats, which means that avoiding cheeseburgers and French fries is a must. Overall, it's safe to say that fast food isn't dangerous for your health because it is fast—it's dangerous because it is plastic.

If you continue to feed your body plastic fats, you will never get well. But if you give your body good fats along with the other things it needs, your body will thank you by becoming vibrant and healthy.

Examples of good fats include avocados, raw nuts, safflower oil, sunflower oil, olive oil, borage oil, corn oil, coconut oil, etc. In general, good fats are those that will spoil. Coconut oil is better for cooking than olive oil because it withstands heat better.

The Magic of Raw Milk

One excellent source of healthy fat is raw milk. In fact, it has all the fats you need in exactly the right proportions. Raw milk and cream are total foods. The offspring of mammals thrive on mother's milk, and millions upon millions of children have thrived on raw cow's milk down through the ages. Pasteurizing milk—far from making it safe—actually damages the proteins in it. Homogenization fractures the long fat chains and turns them into toxic little pieces of the original chains. Raw milk is a nearly perfect food, but pasteurized/homogenized milk is toxic.

Lactose intolerance has become a very common condition in our culture. In reality, people who think they are lactose intolerant are actually allergic to the toxic brew called pasteurized/homogenized milk.

What about infections lurking in raw milk? They are extremely rare. In fact, data from the Centers for Disease Control indicates that 90% of the infections that come from milk are found in pasteurized milk, not raw milk.

A simple experiment can help explain why. If you put a glass of raw milk next to a glass of pasteurized milk and then introduce an equal amount of bacteria into each one, the bacteria in the raw milk will die quickly while the bacteria in the pasteurized milk will multiply just as quickly. This happens because raw milk contains bacteria-destroying peroxidases and enzymes, but pasteurized milk does not.

The Truly Incredible Egg

Eggs are another total food. The trick is to get free-range eggs that are also hormone free. Most eggs come from chickens that are fed hormones or hormone promoting, processed foods so that they will lay more eggs. The chicken's necks are held in clamps so they cannot move and lights are kept on day and night to further increase production. Free-range chickens lay eggs that provide more voltage and have fewer toxins. If you can find ways to eat them raw, such as in a healthy shake, so much the better. Cooking eggs destroys some of their food value.

2. The Role of Hypothyroidism in Metabolic Syndrome

The total number of mitochondria in cells, and thus the total number of rechargeable ATP/ADP batteries, is dictated by the amount of functional thyroid hormone present in cells. If normal levels of thyroid hormone are reduced, the body develops hypothyroidism and the number of mitochondria in individual's cells is restricted.

Hypothyroidism is a very common condition that is implicated in what is called metabolic syndrome (formerly known as syndrome X).

Many doctors believe this is the basic problem behind most of the illness in the United States today.

Symptoms of metabolic syndrome include insulin resistance, high blood pressure, central obesity (overweight with fat deposits mainly around the waist), decreased HDL or "good" cholesterol, elevated triglycerides (blood fats), and an increased risk for clotting.

Metabolic syndrome may lead to stress, migraine headaches and even to ADHD. It causes both childhood and adult obesity. Left uncorrected, it can cause heart attacks, strokes, and fibromyalgia. Eventually it will lead to cancer.

Traditional Western medicine has not found a solution for metabolic syndrome other than diet and exercise. Unfortunately, diet and exercise alone may not reduce blood pressure, correct diabetes (which starts as insulin resistance), correct blood lipids, or even ensure weight loss. This is why yo-yo dieting is so prevalent, and so discouraging.

Symptoms of hypothyroidism include:

- **Fatigue**—Hypothyroidism makes people tired, so they turn to sugar and caffeine to help them get through the day.

Beware of MSG

In addition to hypothyroidism, MSG has been shown to be a major contributor to obesity. MSG is a flavor enhancer that is added to countless foods found in grocery stores, restaurants, school cafeterias, and more. It is found in processed foods, fast foods, and even in baby formulas.

An excitotoxin, MSG does what its name implies: It overexcites cells to the point of damage. Because it is dangerous, food manufacturers try to hide its presence by listing it under a variety of names including (but not limited to) "other spices," gelatin, hydrolyzed vegetable protein (HVP), yeast extract, malted barley, rice syrup or brown rice syrup. MSG damages the brain so it can't recognize leptin, a hormone that tells you when you are full. With MSG in play, you always feel hungry. In fact, that's why manufacturers add it to their products. MSG is addicting and it makes you want to eat more, which means more profits for the food manufacturers.

- **Weight gain**—The vicious cycle of feeling tired and looking to sugar and caffeine for extra energy leads to increased consumption of soda and other unhealthy snacks.
 - Soda and most processed foods contain high fructose corn syrup (HFCS), which has been shown to increase insulin levels and the amount of fat in tissues. HFCS turns into triglycerides and fat within 60 minutes of ingestion.
 - A recent study found that nearly half of all samples of HFSC tested were contaminated by mercury (due to the methods used to produce it).
 - The 2005 actuarial curve used by insurance companies shows the rise in cardiovascular disease, obesity, hypoglycemia, and diabetes all parallel the increased consumption of HFCS in our society.
 - The other culprit in soda, caffeine, depletes the body of neurochemicals. This leads to brain fog, insomnia, poor memory, anger, confusion, etc. Caffeine also acts as a diuretic and lowers voltage in the body.
- **High cholesterol**—Lack of thyroid hormone reduces the production of all hormones in the body. When hormones are low, the liver increases its production of cholesterol in an effort to normalize hormone levels

Symptoms of metabolic syndrome include:

- Impaired glucose tolerance/insulin resistance
- High blood pressure
- Central obesity (also known as visceral male-pattern or apple-shaped adiposity)
- Decreased HDL cholesterol and elevated triglycerides (blood fats)

Causes of Hypothyroidism: Iodine Deficiency

So what are some causes of hypothyroidism? One of the most important is iodine deficiency. Without iodine, the thyroid gland is unable to produce sufficient amounts of thyroid hormone. This leaves cells unable to function normally. In response, the body develops hypothyroidism. Although adults need 12-15 mg of iodine per day, Americans tend to be iodine deficient because it is not readily available in our foods. The iodine that once existed in our soils has long since been washed away, and fruits and vegetables grown in this soil are lacking in this essential nutrient. Today, while minute amounts are added to some table salts, the total isn't enough to provide adequately for our dietary needs. Moreover, some of the companies producing table salt substitute bromine for iodine because it is cheaper. But bromine, in addition to not being a nutrient our cells need, is toxic.

Every organ in the body that secretes a substance requires large amounts of iodine to carry out this function. These organs include: the thyroid gland (with the highest concentration of iodine), the salivary glands, cerebrospinal fluid and the brain, the substantia nigra of the brain, the choroid plexus, intestinal mucosa or lining, breasts,

ovaries, prostate, the ciliary body of the eye, the nose, sinuses, and the mouth. Interestingly, these are the most common sites in the body for cancer among Americans.

Half a world away, the Japanese have different eating patterns than we do in the U.S. Japanese people consume large amounts of iodine in their foods. Coincidentally, they have the lowest incidence of cancer in the world (except for stomach cancer, which may be related to other aspects of their diet).

Iodine and Lugol's Solution

The importance of iodine to our body's health cannot be overestimated. In addition to expediting normal thyroid function, iodine works as the immune system's bug killer, both inside and outside the body. The parts of the body that are exposed to the outside world have iodine levels .30 times that found in the blood. Years ago parents routinely put tincture of iodine on their children's wounds. Today we know that having optimal levels of iodine in their systems can help people avoid infections and prevent chronic conditions.

What is the best way to ensure this, since people in the U.S. tends to be iodine deficient? Taking iodine in pill form can kill all of the good bacteria in the gut. That means that if you take iodine pills you will solve one set of problems but, in the process, create another (good bacteria should be protected, not eliminated). A far better means of increasing your iodine level is by dosing it through the skin. This can be done by spraying Lugol's solution (also known as Lugol's iodine) on the skin each morning after showering. Be sure to dry this water-based solution before dressing as it will stain clothing. (Use a hairdryer on the application site.)

Lugol's solution was first made in 1829 by a French physician named J.G.A. Lugol. It consists of elemental iodine and potassium iodide dissolved in water. It is safe to drink. In fact, it is used for emergency disinfection of drinking water. Be sure to use only Lugol's in this manner, not a tincture of iodine because the tincture is made with alcohol and is toxic if taken internally. Lugol's is absorbed into the body according to need. If a person is iodine deficient, his or her body will absorb the Lugol's gradually. Within 24 hours the stain from the solution will disappear. Lugol's should be applied daily until it is no longer absorbed into the body. At that point your body is telling you that you have enough in your system, and you only need to apply it once per week thereafter for maintenance.

Iodine: Vital for Health

Iodine plays a critical role in the health of people of all ages—even before they are born. Fetal iodine levels are five times that of an expectant mother. If the expectant mother's levels of iodine are too low, miscarriage, birth defects, failure to thrive once the baby is born, and mental retardation can result. It is very important for women who will become pregnant to protect their levels of iodine.

Iodine deficiency is the leading cause of intellectual impairment in the world. (What does this say about the increasing rates of ADD and ADHD in our society?) Hypothyroidism is also the leading cause of violent behavior in the world.

Drinking Lugol's is an excellent treatment for food poisoning because it kills bacteria. It will even inactivate snake venoms and help prevent allergies. (Iodine inactivates large foreign proteins that are ingested, thus preventing them from becoming allergens.)

Another Cause of Hypothyroidism: Fluoride

According to Mark Starr, M.D., author of *Hypothyroidism Type 2: The Epidemic*, up to 90% of Americans have undiagnosed hypothyroidism. He says this is the reason for our widespread and growing problems with mental and physical health. Starr believes the primary cause for this epidemic is the presence of fluoride in our water and dental products. He maintains the problem can be treated easily and inexpensively. The first step is to stop exposure to fluoride. Of course, most doctors will not give this advice to patients. Why do they overlook such a dangerous link? To find out, let's take a look at the way the thyroid gland works.

The Thyroid Gland and Metabolism

Located in the front part of the neck, tucked around the windpipe, the thyroid gland's job is to convert iodine into hormones that control the cell's mechanism for changing raw materials into useable energy. This process is called metabolism. The thyroid gland works by combining iodine (thyroid cells are the only cells in the body that can absorb iodine) with an amino acid to produce hormones. The thyroid hormones are then released into the bloodstream and transported throughout the body. When the level of thyroid hormones drops too low, the pituitary gland steps in by producing thyroid stimulating hormone (TSH), which in turn pushes the thyroid gland to start producing more thyroid hormones.

The most active form of thyroid hormone is known as T3. It is responsible for signaling all the cells in the body that they need to get busy and do their work. If T3 is not produced, the signals aren't transmitted and the cells don't function as they should. In the brain, for example, a lack of T3 decreases the level of serotonin, the "feel good hormone" we rely upon for emotional well being. If T3 is not available, serotonin levels drop and we become depressed and anxious.

Testing For Thyroid Deficiency

When a doctor decides to check the function of the thyroid gland, he or she begins by ordering blood tests that measure levels of TSH, T3, and another thyroid hormone called T4. While T4 is less active in the metabolism process than T3, it nonetheless plays an important role. Frequently the results of these tests fall within a normal range. So patients are told they are fine and sent on their way.

But the tests may not be accurate because iodine is a halogen, a class of non-metal elements that include fluoride, chlorine, bromine, and astatine. The problem in this scenario is that fluoride is a bully. Whenever an atom of fluoride is present along with an atom of any other halogen, the fluoride will push the other halogen aside and take its place. Normal thyroid hormone is made up of an atom of tyrosine surrounded by four atoms of iodine. When fluoride is present, it displaces the iodine. The result is a

substance that looks normal in lab tests, but doesn't work properly in the body. And thanks to the widespread fluoridation of our water and its inclusion in so many dental products and treatments, most Americans are exposed to fluoride on a continuing basis. This is why hypothyroidism is such a problem in our culture.

The seriousness of this situation is compounded by the fact that once fluoride has been introduced into the body, simply eliminating it and adding more iodine won't be enough to make things right. Researchers have discovered that even low doses of sodium fluoride permanently destroy the thyroid gland. Most people who have been exposed to fluoride will require permanent supplemental thyroid hormone. In the U.S., this means seeing a doctor and getting a prescription.

Additional Causes of Hypothyroidism:

- Estrogen dominance caused by soy products, petrochemicals, fuel exhaust we breathe, estrogenic hormones in meat and chickens, plastics, propylene glycol (an ingredient in deodorants), sodium laurel sulphate in toothpaste and ointments, herbicides, and pesticides. These potent estrogenic substances block the production of thyroid hormone and greatly magnify the incidence of estrogen-dependent cancers. Researchers have found that virtually all males and females in developed nations have estrogen dominance, which occurs when there is more estrogen in a person's system than progesterone.
- Antibiotics, chlorine from our water purification systems, fluoride, and NSAID drugs used for arthritis kill healthy bacteria in the intestinal tract. This results in an overgrowth in the intestines of *Candida*, fungus, mycoplasma, and anaerobic bacteria (yeast syndrome). These dangerous organisms release

Beyond Blood Tests: Diagnosing Hypothyroidism at Home

Blood tests have repeatedly proven to be unreliable in diagnosing hypothyroidism. But there are other ways of finding out about the efficiency of your thyroid gland. One of the best is measuring the basal body temperature, which is the body's temperature while it is at rest, before any activity has started. You do this by putting a thermometer at your bedside and taking your temperature first thing in the morning. Continue for several days to make sure of accuracy.

One caution: Many thermometers are not sensitive enough to provide an accurate diagnosis. That's why many doctors and hospitals rely upon temporal artery thermometers. These thermometers work by placing a sensor in the center of the forehead and gently sliding it on a line over the top of the eyebrow to the hairline. If you find that your temperature is below 97.6 degrees, you have type 2 hypothyroidism. If your temperature is below 96 degrees, you will need to take thyroid hormone, which is only available by prescription from a doctor.

powerful neurotoxic substances into the bloodstream that damage the hypothalamus, often resulting in multiple endocrine disorders including underactivity of the thyroid gland.

- Mercury that is released from dental amalgams is toxic to the thyroid gland.
- Selenium deficiency is related to lack of trace minerals in our soil. Proper conversion of precursors into thyroid hormone depends on a selenium-containing enzyme that is, unfortunately, lacking for most of us.
- Diagnostic x-rays of teeth, neck, and spine injure the thyroid gland.
- Perchlorates widely found in drinking water slow the production of thyroid hormone by blocking the re-uptake of iodine. Perchlorates are salts derived from perchloric acid. They occur both naturally and through manufacturing and have been used as a medicine for over 50 years to treat hyperthyroidism, which occurs when the thyroid gland is too active. Levels above 0.007 milligrams per kilogram per day (mg/kg-d) can temporarily and reversibly inhibit the thyroid gland's ability to absorb iodine from the bloodstream. Thus, perchlorates are a known cause of goiter. As of April of 2007, the EPA has not been able to determine whether or not perchlorates are present in sufficient levels in our environment to require a nationwide regulation on how much should be allowed in drinking water.

Mucin

As hypothyroidism develops, the body starts making mucin. A substance that resembles clear corn syrup, mucin is deposited throughout the tissues along with fat molecules. As hypothyroidism continues on its course, people start gaining weight in a pattern typical of metabolic syndrome—overweight with fat concentrated in the middle of the body. A simple way to check for mucin in your tissues is to pinch the skin over your deltoid muscle between your shoulder and arm. Under normal circumstances your fingers should nearly touch. Any bulk you feel in that area is caused by an accumulation of mucin.

Results of having mucin in your tissues:

- Mucin makes it difficult for blood to flow through tissues. The body responds by increasing blood pressure to force blood through the tissues. This is called hypertension or high blood pressure.
- Mucin surrounds cell membranes, making it difficult for insulin to access the membrane. Insulin resistance develops, leading to type 2 diabetes.
- Mucin is deposited in the organs of the abdomen, resulting in “beer belly” obesity.

Traditional Medical Therapy for Metabolic Syndrome

- Hypertension medications are prescribed to lower blood pressure. These medications make circulation through the mucin even more difficult, which results in less nutrition and oxygen getting into the cells.
- Diabetes medications are prescribed to lower blood sugar. This results in even lower levels of sugar getting INSIDE the cells, where it matters.
- Surgeries correct obesity by removing part of the intestines or installing a band around the stomach. This results in the body getting very little nutrition.

- High cholesterol/triglyceride medications are prescribed to lower cholesterol. This makes it even harder for the body to make hormones and repair the brain, which is 50 percent cholesterol by weight.

3. Heavy Metals

Heavy metals such as lead, mercury, and cadmium destroy mitochondria.

Lead may cause irreversible neurological damage, renal disease, cardiovascular problems, and reproductive problems.

Symptoms of chronic lead poisoning include:

- Reduced cognitive abilities
- Nausea
- Abdominal pain
- Irritability
- Insomnia
- A metallic taste in the oral cavity
- Excessive lethargy or hyperactivity
- Headaches
- Seizures
- Coma
- Anemia (which is often mistaken as iron deficiency anemia)
- Kidney problems
- Reproductive problems
- Gastrointestinal problems, i.e. constipation, diarrhea, vomiting, poor appetite, weight loss

Note: Acute lead poisoning is the only type of lead poisoning that can be detected through blood tests. Chronic poisoning will go undetected in blood tests. Lead does not remain in the blood, but rather moves deep into the tissues where a blood test cannot detect it. A blood film examination may reveal basophilic stippling of red blood cells as well as changes that are normally associated with iron deficiency anemia. For this reason, lead poisoning can sometimes be confused with iron deficiency anemia. If a patient doesn't respond to treatment for anemia, lead poisoning should be considered.

Lead and the Nervous System

Lead affects the peripheral and central nervous systems. The most common sign of peripheral neuropathy due to chronic lead poisoning is painless wrist drop (weakness of the extensor muscles in the hand), which usually develops after many weeks of exposure.

Multiple researchers and child advocacy groups have confirmed there is a direct link between early lead exposure and extreme learning disabilities.

A May 2000 study by Rick Nevin, an economic consultant, theorizes that lead exposure explains 65-90 percent of variation in violent crime rates in the United States and other countries.

Lead inactivates enzymes by replacing calcium, iron, and zinc. It has no known biological role in the body. Toxicity comes from its ability to mimic other biologically important metals, most notably calcium, iron, and zinc. Lead is able to bind to and

interact with the same proteins and molecules that occur in these metals, but after the other metals are displaced the molecules function differently and fail to carry out some reactions such as producing enzymes necessary for certain biological processes.

Traditional medicine believes that the majority of lead poisoning incidents occur in children under the age of 12. However, recent examinations show that many adults suffer from lead poisoning as well.

Main sources of lead poisoning include:

- Ingesting lead-contaminated soil.
- Ingesting lead dust or chips from deteriorating lead-based paints. Small children also tend to teethe and suck on painted windowsills as they look outside.
- Drinking water that has been contaminated through plumbing fixtures that are either made of lead or have trace amounts of lead in them.
- Exposure to metallic lead through small metallic objects. Although rare, this can lead to an increase in blood levels when the lead is retained in the gastrointestinal tract or appendix.
- Some imported cosmetics such as kohl and surma. Kohl is made from soot and other ingredients and used by mainly women but also by some men to darken eyelids and eyelashes. It originates in the Middle East, India, Pakistan, and some parts of Africa. Surma comes from India.
- Imported toys, including many made in China, have become a major concern in the U.S. Many items imported from China contain lead.
- Folk remedies such as azarcon, which contains 95 percent lead and is used to “cure” empacho (an impacted stomach).
- Direct contact with lead occurring through the mouth, nose, eyes, and breaks in the skin.

Some facts about lead:

- Most people born before 1950 were exposed to lead through gasoline and paint.
- It only takes a piece of lead the size of a grain of salt to poison you.
- Lead tends to be suppressed in bones by hormones. As your hormone levels decrease, lead leaches out of bones and often affects the heart when a person is in his/her 40s-50s—which is the prime age for heart attacks!

Burton’s Line

In humans, lead toxicity sometimes causes the formation of a bluish line along the gums that is known as Burton’s line. It is very uncommon in young children.

Mercury acts as a poison to the brain and nervous system. In adults, mercury poisoning has been linked to fertility problems, memory and vision loss, and trouble with blood pressure regulation. It can also cause extreme fatigue and neuro-muscular dysfunction.

Pregnant women and small children, whose brains are still developing, are especially at risk. Fetuses and infants who are exposed to mercury may develop:

- Mental retardation
- Cerebral palsy
- Deafness
- Blindness.

Even in low doses, mercury can interfere with a child's development, leading to shortened attention span and learning disabilities.

And the problems don't end there. Studies show that mercury in the central nervous system causes psychological, neurological, and immunological problems including:

- Arrhythmias and cardiomyopathies
- Tremors
- Insomnia
- Personality changes and irritability
- Headaches
- Weakness
- Blurred vision
- Slowed mental response
- Unsteady gait

After entering the body, mercury migrates to fatty tissues like those in the brain, liver, kidneys, and endocrine glands. It bonds very firmly to the brain and spinal chord and, unless actively removed, has an extremely long half-life of between 15 and 30 years (half life is a number used to describe how long it takes for a given substance to decay).

Main sources of mercury poisoning include:

- According to the World Health Organization, 80 percent of the danger we face from mercury comes from the mercury in amalgam dental fillings.
- Another unexpected source is through high fructose corn syrup (HFCS). A recent study found that almost half of tested samples of HFCS contained mercury. This occurs because of the way HFCS is manufactured. Mercury was also found in nearly a third of 55 popular brand-name food and beverage products in which HFCS is listed as the first or second ingredient. It is thought that damage from consuming mercury-contaminated HFCS may be cumulative, with levels increasing over time.
- In 1998 the U.S. Environmental Protection Agency (EPA) issued a report citing mercury emissions from electric utility facilities as another large anthropogenic source of mercury that is released into the air. EPA officials estimated that about 50 tons of elemental mercury is emitted each year from U.S. coal-burning power plants. Lesser amounts come from oil and gas burning units. According to EPA estimates, emissions from coal-fired utilities account for 13-26 percent of total (natural and anthropogenic) airborne emissions of mercury in the U.S

Some facts about mercury:

- One-quarter of the adults recently tested in New York City had elevated levels of mercury in their blood. A study by the city's Department of Health and Mental Hygiene found that mercury was highest in Asians, women, and those with higher incomes.
- Most of the cancer patients seen in Dr. Tennant's clinic up to this point have had elevated levels of mercury and lead in their systems.

Detecting Heavy Metal Poisoning

- Heavy metals don't remain in the blood but rather move quickly into the tissues. If you find heavy metals in a blood test, it means you have current and ongoing exposure.
- The most accurate way to test for heavy metals is with a chelation-urine provocative test in which a chelating agent is given IV and then a six-hour urine sample is collected and tested for heavy metals.
- Hair tests are not a reliable means of testing for heavy metals.

Removing Heavy Metals

- Materials like zeolite, chlorophyll, cilantro, etc., are not reliable ways of removing heavy metals from the body. These products remain in the gut and are not absorbed into the system. Heavy metals are generally embedded deep within the tissues, which means zeolite, etc., cannot access them.
- The most reliable way to remove metals is with chelation.
- Sweating (induced by infrared saunas), raw garlic, glutathione, etc., are also helpful.

4. Dental Infections Related to Tooth Decay, Root Canals, and Jaw Bones

Dental infections destroy mitochondria through thioethers (unstable chemical compounds) and gliotoxins (fungal toxins), which are found in cavities, root canals, and jaw infections. Unfortunately, our current solutions to these dental woes don't offer much hope in terms of promoting healthy mitochondria. In addition, the mercury in amalgam fillings destroys many of the rechargeable ATP/ADP batteries in cells.

All mercury fillings continually leak substantial amounts of mercury gas into the body, which is why mercury from fillings is responsible for most of the mercury exposure that occurs. Mercury comes off of fillings every time the fillings are stimulated through rubbing, temperature changes (occurring with consumption of hot beverages like coffee), teeth grinding, or chewing gum.

In 1985 the International Academy of Oral Medicine Toxicology decided to determine the amount of mercury that comes off fillings through a series of tests performed on sheep. They found that a substantial quantity of mercury spread to every organ in the sheep in just 30 days. The sheep's kidneys lost some of their ability to function. When the

tests were performed on monkeys, whole body imaging discovered the same thing. The mercury released from “silver” fillings provoked and increased both mercury and antibiotic resistant bacteria in the primates’ oral and intestinal flora within two weeks of acquiring the fillings. Further studies showed damage to brain neuron proteins.

In 1991 The World Health Organization acknowledged that the predominant source of mercury exposure in our culture comes from dental fillings. There is no such thing as a safe mercury filling—they all leak. If mercury and lead both happen to be present in the system, the combination is many times more toxic than mercury alone.

The manufacturers of amalgam filling material state that mercury is contraindicated for:

- Expectant mothers
- Children aged 6 and under
- Proximal or occlusal contact to dissimilar metal restorations
- Patients with severe renal (kidney) deficiency
- Patients with known allergies to amalgams
- When used as retrograde or in endodontic fillings
- When used as a filling material for cast crowns

Unfortunately, dentists don’t always follow manufacturer’s directions. Most gold and porcelain crowns cover the mercury amalgam fillings that have caused a problem tooth to fracture. This means that the mercury is still there. And x-rays will not show what is occurring with a tooth after a crown is in place.

Is there a way to discover if you have a problem?

You can measure the voltage leaking from dental fillings made of metal with a common voltmeter purchased from a hardware store. Simply put the voltmeter’s black probe on the inside of your cheek and the red probe on the filling. Any measurement above 20mv is abnormal. You shouldn’t have more than 30 mv coming from a tooth that simply has a filling.

Crowns can present special problems. Porcelain crowns are usually placed over a metal cap. You can see the metal caps at the gumline and can put a voltmeter there and see what is going on underneath the porcelain crown. If as much as 100 mv comes from a tooth with a crown, a visit to the dentist will confirm that there is a problem. When the dentist lifts off the crown, there will always be decay beneath it.

When mercury fillings are removed they should be replaced with composite fillings. As this procedure is undertaken patients should be sure to use an auxiliary air supply mask so they won’t breathe in their own air, which will include mercury vapors. A rubber dam should also be fitted inside the mouth to keep the mercury from being swallowed.

Root Canals

A tooth that has a root canal is by definition dead. All dead tissues in the body carry infection, and this can cause problems that use up the body’s voltage. If you pull out a tooth that has had a root canal, put it in a glass of saline water for a day, and then take a

single drop of the saline solution and inject it into a mouse, the mouse will die in less than a minute due to the toxins. These toxins are released into the body through infections in the teeth. The toxins are called gliotoxins and thioethers. Teeth that have root canals always become infected. That is why root canals must be removed and replaced with a bridge. Any dead tissue in the body must be removed, whether it is a tooth, an appendix, or a big toe. The dentist who originally invented the root canal procedure, George E Meinig, D.D.S., later came to realize the problems created by root canals. He spent the last years of his career trying to get dentists to stop doing this type of surgery. In the process, he wrote the book *Root Canal Cover-Up*.

Infections in Jaw Bones

Dental cavitations are infections that occur in jawbones. The problem often originates when an infected root canal tooth spreads toxins into the jawbone. It can also happen when a tooth is pulled but the ligament that holds the tooth to the jaw is not removed by the dentist. The ligament rots and the area under the bone becomes a small abscess in the jaw. This condition usually doesn't cause any pain or at most minimal pain. That's why most patients don't even know they have it. However, the toxins that escape from cavitations are severe and can cause damage to other organs in the body. It is estimated that one root canal tooth can put out enough toxins to inactivate 80 percent of your immune system; toxins from cavitations are worse than those from root canals.

6. Toxins

Excessive toxins are hazardous and must be removed from the body. Most of the toxins that cause problems are fat soluble, so they end up being embedded in a globule of fat. They are sent in this form to the liver, which works like an air conditioning filter to remove them from the blood. It is then the liver's job to change the toxins from their fat soluble form into a water soluble form that can be excreted from the body through the kidneys.

Liver Facts

- In an attempt to keep toxins out of the heart and brain, the body puts many of the toxins into fat cells, joints, and skin.
- Like any other filter, the liver gets dirty. Because the liver consists of 4.6 lbs. of fat and the toxins that go through it come in the form of fat globules, water alone won't clean it. It's like having grease on your hands. You can't clean grease off your hands with water—you need soap. So the liver uses a type of soap—cholesterol—to clean itself.
- It's a good idea to augment this process with periodic liver cleanses.
- Sweating, infra-red lights, garlic, glutathione, etc., can be helpful in getting these toxins out of your system.
- The large intestine and gall bladder are often dirty as well and need to be cleaned. When these organs are dirty, parasites may also be present.

What Should You Do Now If You Are Sick and Need Help?

First Steps

- Stop consuming partially hydrogenated fats and canola oil.
- Correct your iodine levels with Lugol's iodine.
- Check your morning temperature. If it is less than 97.6, you are hypothyroid and will need to take thyroid hormone under the supervision of a doctor. (It needs to be Amour thyroid, not a synthetic version.)
- Have a urine provocative test for heavy metals. Remove all mercury fillings.
- Remove all root canal teeth and replace with a bridge.
- Drink a total nutrition shake daily to provide the raw materials your body needs to make new cells. It can include:

Phytoplankton

- Raw milk
- Raw eggs
- Chia seeds
- Vitamin C
- Raw nuts
- Raw fruit including wolfberries
- Take probiotics (good bacteria every day)
- Eat 90 percent of the rest of your diet as raw, unprocessed foods (the literature is confusing about cooking, but cooking removes electrons)
- If you smoke, quit. You may not be successful with this until you correct the dopamine in your brain.
- Avoid all artificial sweeteners and MSG
- Avoid sodas, coffee, tea (except herbal and green), alcohol (fermented means it contains fungus and also chlorinated water)
- Avoid fluoride in all forms including toothpaste. If you go to the dentist and he wants to slather your teeth with fluoride, don't let him do it.
- Eat only wild or free-range meat and keep consumption to less than 10 percent of your diet.
- Do not take antibiotics unless your life depends upon it because they create their own set of problems.
- Avoid processed sugar like high fructose corn syrup.

Steps You Can Take To Increase Your Cellular Energy

1. Since the body is 75 percent water, drink water that has significant voltage in it (donates electrons). It will help charge your cells and thus keep them healthy.
2. Use a water ionizer (e.g., Jupiter Neptune) to get water that donates electrons. You can use a dial in the device to choose the amount of voltage you want in your drinking water.
3. If you have pain, consider using a Biomodulator.

- Use honey for sweetener (honey is anti-fungal). You can also use stevia.
- Corn and peanuts always contain fungus and must be used in moderation or avoided.
- Granny Smith apples and carrots are anti-fungal. Use them when you crave sweets. Juice 1 apple and 2 carrots for a very invigorating, healthful drink. Use this drink when you crave sweets.

The Cost of Getting/Staying Healthy

Taking control of your own health is critical. You cannot depend on your physician to keep you well and healthy.

Many people say they cannot afford to implement the plan outlined in this booklet because much of it won't be covered by their insurance. However, depending upon your dental needs, you will find that it costs less to get healthy than it does to buy a car.

In our culture people have a 50 percent chance of dying from cancer and, before that happens, suffering from migraines, obesity, diabetes, hypertension, fatigue, etc. If you don't implement the suggestions outlined in this booklet, you won't need a car.

Compiled by Laura Jones
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Tennant Institute for Integrative Medicine