

# How Toxins Make You Sick by Cynthia Perkins, M.Ed. (2007)

**T**hrough my years of research and as a student at the Academy of Functional Medicine, Dentistry & Psychology, studying under Dr. Charles Gant, here are a few things I have learned about toxicity, detoxification, the autonomic nervous system, and its impact on our health. If you need a good doctor, then Dr. Gant is a great choice and who is exceptionally knowledgeable about detoxification, MCS, CFS, adrenal fatigue, depression, anxiety addictions and more. If you'd like to learn in more depth about some of the things I am presenting on this paper and about functional medicine in general, I highly recommend the Academy of Functional Medicine. Links for Dr. Gant and the Academy can be found at the bottom of this paper.

Toxins of all kinds are able to cross the blood brain barrier. In our brain stem, we have toxin receptors called xenosensors. Xeno refers to xenobiotics, which are chemicals that are foreign to life. Sensor refers to responding to stimuli. Consequently, xenosensors sense foreign chemicals in the body.

When a toxin is detected by the xenosensor, it performs two functions. One, it sets off the fight/flight system warning us that there is threat to our existence; and two, it activates our detoxification system.

The fight or flight system warns us "hey, there's a threat to our being here; and we need to take action" and the detoxification system is called in like the Calvary to eliminate the threat.

When a toxin receptor is stimulated, this triggers our Locus Coeruleus. The Locus Coeruleus resides in the brain stem, and it then releases norepinephrine which is an excitatory neurotransmitter that sets off the fight/flight response. It only takes one neuron in the Locus Coeruleus to instantly ignite all the cells in the

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Additionally, Cynthia has personal experience with Chemical Injury (MCS), Atypical Trigeminal Neuralgia, Chronic Migraines, Adrenal Fatigue and Attention Deficit Hyperactivity Disorder, so she not only has professional expertise, but understands the terrain of dealing with a chronic health condition first-hand.

Cynthia's self-help articles are published widely across the Internet and her works have been in print publications such as, At Issue: Alcohol Abuse, Modern Sage, The Wellness Connection, Our Toxic Times, The Nose, The National Association of Woman Writers, The Australian Woman's Forum, Greenery Press and Bird Watchers Digest.

body; because, when we are faced with a threat. there is no time for delay.

This triggers the amygdala which is connected to the emotions like fear and anger that we often experience when under stress, which then triggers the hypothalamus. The hypothalamus then stimulates the pituitary to release adrenocorticotrophic hormones (ACTH) which then stimulates the adrenal glands to release cortisol; and pre-ganglion sympathetic neurons stimulate the adrenal medulla to release epinephrine.

This system is called the fight/flight system, also known as the stress response system or the sympathetic nervous system, and takes place in the area of the brain called the limbic system. It is designed to protect us from threats like predators. It is a survival mechanism. In our earlier development as a species, it protected us from predators like lions. When we would see the predator, the stress response system would go into action to help us deal with the stress of escaping the predator.

We would escape the predator, the sympathetic nervous system would turn off, and the body would return to its pre-stress state called the parasympathetic state, which is a state of rest, digest and relaxation. The predators we face today come in the form of environmental toxins. Toxins are a threat to our survival in the same, and they are why we have a toxin receptor that triggers the stress response system. It's telling us that they are harmful to our existence and that we should get away from them.

The problem in this day and age is that we are surrounded by predatory toxins everywhere we go and that we can't escape them. Consequently, we never return to the parasympathetic state. For example, pesticides and herbicides are at the store, on your food, at the bank, the park, the highways, and in your neighbor's yard; and you're faced with air pollution, food additives, preservatives, perfume, heavy metals, cologne, dryer exhaust, construction of your home, car, computers, cell phones, cell towers, disinfectants, air fresheners etc., etc., etc.

Every time we are exposed to these toxins, they trigger the toxin receptor and set off the stress response system. The more toxins you are exposed to, the more often you are thrust into fight or flight. The stress response system is essential for our survival; however, it was only intended to be used for brief emergencies, not extended periods of time. When we remain in this state for too long, it becomes degenerative. The body actually prefers to be in the parasympathetic state where it is regenerative.

When the body is in fight/flight, there is a *cascade of physiological and psychological events that take place in the mind and body*. Blood pressure and heart rate go up, digestion is shut down, metabolism and circulation are impaired, blood sugar rises which leads to high levels of insulin, hormones are disrupted, neurotransmitters are drained, detoxification is impaired, sleep is interrupted, memory and cognition may be impaired, immune function is weakened, and there are high levels of anxiety and fear.

Our senses are also heightened, particularly our sense of smell. Thus, partially explaining why individuals with MCS have a heightened sense of smell for chemicals or fragrances. All of this is designed to give us laser targeted focus and lightning fast energy and

stamina to withstand an emergency. We are in a state of high alert, or in other words, hyper vigilance.

If you spend too much time in the sympathetic state, then physical and emotional health deteriorates and we age quickly. All the organs and systems may become affected, and the body begins to break down in many areas. Symptoms, conditions, diseases, and syndromes begin to develop into multiple chemical sensitivities, chronic fatigue, adrenal fatigue, insomnia, high blood pressure, circulation disorders, gastrointestinal disorders, heart disease, headaches, addiction, panic attacks, ulcers, autoimmune disorders, anxiety disorders, depression, and more.

It isn't just external toxins that trigger the sympathetic nervous system into action, its internal toxins as well like candida yeast, lyme, bacterial overgrowth, and parasites. Each of these organisms emits toxins that set off the same stress response. Even naturally occurring toxins like ammonia and by products of estrogen can trigger the stress response if the body is not clearing them adequately.

Basically, toxins = toxic stress.

Additionally, it isn't just toxic stress we are under; there are many other kinds of stress as well. Dr. Charles Gant tells us that there are at least 12 different types of stress. There can be spiritual stress which results from lack of meaning and purpose in life, metabolic stress like hypoglycemia or insulin resistance, oxidative stress like sleep apnea, immune

### LIST OF INGREDIENTS TO AVOID

12 toxic & carcinogenic compounds found in beauty & skin care products

<b>Benzoyl Peroxide:</b> Used in acne products, the MSDS states: Possible tumor promoter. May act as mutagen; produces DNA damage in human and other mammalian cells. Also, toxic by inhalation. Eye, skin and respiratory irritant.	<b>DEA (Diethanolamine), MEA (Monoethanolamine), &amp; TEA (Triethanolamine):</b> This foam booster is a skin/eye irritant and causes contact dermatitis. Easily absorbed through skin to accumulate in body organs & the brain.	<b>Dioxin:</b> Won't appear in ingredients. Often in antibacterial ingredients like triclosan, emulsifiers, PEGs and ethoxylated cleansers like Sodium Laureth Sulfate. Dioxin causes cancer, reduced immunity, nervous system disorders, miscarriages and birth deformity.	<b>DMDM Hydantoin &amp; Urea (Imidazolidinyl):</b> 2 preservatives that release formaldehyde which may cause joint pain, cancer, skin reactions, allergies, depression, headaches, chest pains, ear infections, chronic fatigue, dizziness, & insomnia.
<b>FD&amp;C Color &amp; Pigments:</b> Synthetic colors from coal tar contain heavy metal salts that deposit toxins in skin, causing skin sensitivity/irritation. Absorption can cause depletion of oxygen and death. Animal studies show almost all are carcinogenic.	<b>Parabens (Methyl, Butyl, Ethyl, Propyl):</b> Used as preservatives. Not always labeled. Used in deodorants & other skin care products, have been found in breast cancer tumors. May contribute to sterility in males, hormone imbalance in females & early puberty.	<b>PEG (Polyethylene glycol):</b> Made by ethoxylating Propylene Glycol. Dangerous levels of dioxin have been found as a by-product of the ethoxylation process. PEGs are in everything including personal care, baby care and sunscreens.	<b>Phthalates:</b> Found in many products, usually not listed on labels. Health effects include damage to liver/kidneys, birth defects, decreased sperm counts and early breast development in girls & boys.
<b>Propylene Glycol (PG) &amp; Butylene Glycol:</b> Petroleum plastics. EPA considers PG so toxic it requires gloves, clothing, goggles & disposal by burying. EPA warns against skin contact to prevent brain, liver, and kidney abnormalities.	<b>Sodium Lauryl Sulfate (SLS) &amp; Sodium Laureth Sulfate (SLES):</b> Used in car washes, garage floor cleaners, engine degreasers and 90% of personal-care products that foam. Eye damage, depression, labored breathing, diarrhea, skin irritation, & death.	<b>Sunscreen chemicals:</b> Avobenzene, benzophenone, ethoxycinnamate, PABA are commonly used ingredients that are known free radical generators and are believed to damage DNA or lead to cancers.	<b>Triclosan:</b> Synthetic antibacterial ingredient. EPA registers it as a pesticide, posing risks to human health and environment. Classified as a chlorophenol, chemicals suspected of causing cancer in humans.

stress like food sensitivities, structural stress like temporomandibular joint disorder (TMJ), sensory stress like loud noises and bright lights, cognitive stress like unrealistic expectations, energetic stress like electromagnetic fields or endocrine stress like neurotransmitter imbalances or menopause, and the one we are most familiar with-- emotional stress with its never ending of list of possibilities like financial worries, interpersonal relationships, career, etc.

Each of these types of stress has the same impact on the mind and body; they trigger the Locus Coeruleus to release norepinephrine and set off the fight/flight, sympathetic stress response system as we discussed above. The more types of stress you are dealing with then the more often you are thrust into sympathetic fight or flight.

All toxins and/or stressors, trigger the Locus Coeruleus to release norepinephrine and set off the stress response system.

Toxic stress is interconnected to all the other types of stress, and many of the other types of stress are interconnected to toxic stress. For example, toxic stress results in oxidative stress and can trigger immune stress, metabolic stress, spiritual stress, endocrine stress or emotional stress. While infectious stress, energetic stress and immune stress can all become toxic stress. To illustrate this point further, pesticides impair the detoxification system, set off the stress response system are endocrine disruptors, and weaken the immune system; while at the same time, setting off oxidative stress as the body fights off the toxin and emotional stress as the individual struggles to cope with the disruption to their life and the disruption to neurotransmitters that regulate emotional health.

Dr. Gant refers to this phenomenon as the Total Stress Load, and Dr. Sherry Rogers refers to it as the Total Toxic Load, which is the sum total of all the different toxins or stressors that apply to your situation. The higher your total stress/toxic load the more degenerative your health will be. This is often generally referred to as chronic stress.

Additionally, once the toxins cross the blood brain barrier, they can also land on receptors for our neurotransmitters and hormones, thus, disrupting the entire nervous system and endocrine system. They may mimic our neurotransmitters or hormones or impair their ability to perform their functions. For example, pesticides and heavy metals gravitate towards our iodine receptors which then inhibit the thyroid from functioning properly. Pesticides and many other toxins are also xenoestrogens, which means they mimic estrogen in our body, thus causing estrogen dominance and a whole host of health conditions that accompany too much estrogen, like breast cancer, fibroids, and PMS.

Hormones and neurotransmitters are the commander of our ship; when they are not working properly, then none of our systems and organs will run efficiently. The sympathetic nervous system will remain dominant, and degradation of mental and physical health will occur.

When the body is under any type of stress, the Locus Coeruleus stimulates the norepinephrine, which stimulates the amygdala, which stimulates the hypothalamus to

stimulate the adrenal glands to release cortisol. The primary role of cortisol is to counteract stress. If the body is under continual stress because of a high stress/toxic load, then, eventually, it cannot keep up with the demands and cortisol burns out, which leads to adrenal fatigue, which is commonly referred to as chronic fatigue syndrome. The same applies to DHEA, another crucial hormone to counteract stress.

You can see the dilemma this creates; if you are under a high level of stress or toxins, and then you have a very great need for cortisol. However, the high levels of stress or toxins deplete your cortisol levels, so it isn't available to assist you in this process. Thus without cortisol, you are really up the river without a paddle.

Some of the other common consequences of hormone disruption include estrogen dominance, feminization of men, early puberty, reduced sperm count, infertility, hyperthyroidism and then hypothyroidism and cancer. Common consequences of neurotransmitter disruption include addiction, alcoholism, depression, anxiety disorders, insomnia, obesity, obsessive compulsive disorders, and many more.

As we mentioned earlier, epinephrine is also triggered when the fight or flight system is activated and epinephrine then tells the liver to dump the sugar it has stored in reserve into the blood stream for energy to deal with the emergency at hand. This high level of sugar in the blood stream then tells the pancreas to release insulin to bring the blood sugar levels back down. When insulin is released, it then tells the glucose receptors to open up; and, if there is more sugar than is needed at the moment, then it gets stored in the cell as fat. Consequently, one can expect chronic stress to be associated with weight gain and obesity.

If this process happens too frequently, then, eventually, the glucose receptors becomes resistant to the messages of insulin and refuse to store anymore sugar. Consequently, the pancreas releases more insulin. This is known as insulin resistance and leads to hyperinsulinism.

Too much insulin in the body disrupts the cells, causes inflammation and results in another cascade of symptoms and conditions like cravings for sugar, mood swings, weight gain, hypoglycemia, high triglycerides, high blood pressure, excessive fatigue and more. Even though blood sugar is high, it is not available to the cell for energy.

If the process continues, as it does in a state of chronic stress/toxins, then eventually the pancreas becomes too weak to perform its duties or it may become damaged by the excessive exposure to insulin and it no longer releases insulin, which results in glucose levels that are consistently high, type 2 diabetes has developed.

Toxins may even get inside the cell and disrupt DNA transcription, thus inducing changes in the way genes express themselves. Although all of us are vulnerable to this scenario, children are even more vulnerable because their immune system and nervous system are not fully developed.

## Types of Toxins or Stressors

There are many different types of toxins that may set off the fight or flight system. Here is an overview and taken from Dr. Charles Gant's 12 Types of Stresses.

1. Toxic stress - this category refers to substances like pesticides, air fresheners, perfume/cologne, herbicides, heavy metals, industrial and agriculture pollution, electro smog, mold or fungal mycotoxins, solvents, food additives, preservatives and dyes, etc.
2. Infectious stress - refers to viruses, fungus, parasites and bacteria like Candida, lyme, h pylori, worms etc.
3. Cognitive stress - refers to the thinking process and may include things like trying to live up to unrealistic expectations of others or your own, viewing the glass half-empty, a job with a high demand of cognitive functions, setting unrealistic goals for your life.
4. Metabolic stress - may include lack of exercise or too much exercise, hypoglycemia, syndrome x, and pH, blood sugar.
5. Sensory stress - may refer to excessive noise outside, loud noises, repetitive external stimulation, chronic pain, bright lighting.
6. Emotional stress - this is the type of stress that most of us think of when we use the word stress. There are many different types of emotional stress, but some of the most common would include, unemployment, poverty, ending of a relationship, death of a family member or friend, childhood abuse, divorce, relationship difficulties, internal conflict, unhealthy or dysfunctional relationships.
7. Immune stress - might include autoimmune condition, inflammation, food allergies or sensitivities.
8. Endocrine and neurotransmitter stress - imbalance of hormones, depleted adrenal glands, low or high cortisol, low or hyper thyroid, hyperinsulinism, type 2 diabetes, insulin resistance, menopause, andropause, imbalances or disruption of serotonin, dopamine, endorphins and GABA, too much norepinephrine.
9. Purposelessness stress - I refer to this as spiritual stress, which is about the depth of meaning and purpose you have in your, the quality of the relationship you have with yourself, the Universe and others. Your connection to self, others and Universe.
10. Oxidative stress - may include circulation issues, sleep apnea, impaired phase I or phase 2 detoxification, not enough fresh air, breathing or lung conditions.
11. Energetic stress - electro smog that emits from all electronic like cell phone towers, cell phones, computers, etc. , as well as geopathic stress. Structural stress --posture, TMJ, misalignment of the spine, cranio-sacral alignment.
12. Structural stress - posture, TMJ, misalignment of the spine, cranio-sacral alignment.

## Conditions that are Associated with Toxins

Environmental toxins are linked to pretty much every psychiatric and physiological health condition you can think of on one level or another. However, here are some that have the most connection:

- MCS- Multiple Chemical Sensitivity or sometimes called chemical injury.
- Autoimmune disorders
- Cognitive disorders
- Behavioral disorders
- Chronic fatigue also known as adrenal fatigue
- Depression
- All mental health disorders
- Cancer
- Chronic Pain Syndromes
- Anxiety disorders
- Alzheimer's
- Parkinson's
- Autism
- Fibromyalgia
- Hyperactivity
- Multiple Sclerosis - MS
- Lupus
- Arthritis
- Gulf War Syndrome
- Compulsive overeating or other OCD disorder
- Insomnia
- Heart Disease
- High Blood Pressure
- Most neurological disorders
- Obesity
- Post-Traumatic Stress Syndrome
- Alcoholism/Addiction

## Autonomic Nervous System Dysfunction

I also learned through Dr. Charles Gant that this cycle of the Total Toxic/Stress Load sets off what is called dysautonomia, also known as autonomic

**Public Health Warning**  
Chemical fragrances pollute the air, water, ecosystem and cause serious harm to pets, wildlife and humans.

The poster features a central illustration of a family (a man, a woman, and a child) holding hands, with a dog on a leash. Surrounding this central image is a large, dark, starburst-shaped graphic containing various categories of products: Air Freshener, Candles, Incense, Fabric Softener, Dryer Sheets, Detergent, Hairspray, Shampoo, Hairgel, Shaving Foam, Soap, Cologne, Deodoriser, Pet Products, Anti-Bacterials, Diapers, Sunscreen, Baby Products, Nail Polish, Deodorant, and Cosmetics. The text at the bottom of the poster reads: "Scientific research links fragrance ingredients to diabetes, obesity, thyroid disease, low sperm count, early puberty, cancer, neurotoxic effects, asthma, migraines, allergies and mild to life-threatening symptoms in people with chemical injury." Below this, it says "Choose fragrance-free laundry, personal care and cleaning products." and includes the acronym "Raising Awareness of Toxic Chemical Harm to Planet and Life (RATCHPAL)".

Scientific research links fragrance ingredients to diabetes, obesity, thyroid disease, low sperm count, early puberty, cancer, neurotoxic effects, asthma, migraines, allergies and mild to life-threatening symptoms in people with chemical injury.

Choose fragrance-free laundry, personal care and cleaning products.

Raising Awareness of Toxic Chemical Harm to Planet and Life (RATCHPAL)

nervous system dysfunction. The autonomic nervous system is also known as the involuntary nervous system and manages those functions in the body that occur involuntarily like breathing, digestion, circulation, heart rate, blood pressure. It consists of the sympathetic nervous system and the parasympathetic nervous system.

The sympathetic nervous system is your stress response system that we discussed above. It is triggered when you are under stress and provides you with the energy to deal with the situation at hand and is degenerative if we remain in that state for too long.

The parasympathetic nervous system takes over when the stressful event is over and brings us back to a state of relaxation and rest. In the parasympathetic state, breathing is slowed down, blood pressure and heart rate come down, pupils constrict, circulation is increased, digestion runs smoothly, senses return to normal, the bladder contracts, and energy is conserved. It is regenerative and the state that the body actually prefers.

When all is functioning as it should, the sympathetic nervous system turns on when we are under stress, the stress passes, and we return to the parasympathetic state. This process takes place in an area of the brain referred to as the limbic system or sometimes as the old brain or paleomammalian brain. It is believed to be the oldest part of our brain and to have evolved for regulation of the fight or flight system which was needed for survival.

As we discussed above, when we have a high total stress load or toxic load, the sympathetic nervous system is activated all the time; and we are never able to return to the preferred and regenerative parasympathetic state. This is dysautonomia - over activity of the sympathetic nervous system and inactivity of the parasympathetic nervous system.

It is the dysautonomia or the impaired autonomic nervous system that results in all the health conditions listed above. The more often we remain in this state, the more our health deteriorates.

Chronic Stress or Chronic Toxins = High Levels of Norepinephrine

Norepinephrine = Activation of fight/flight system and dominant sympathetic nervous system

The body must get back to the parasympathetic regenerative state for healing to occur, and this is achieved by restoring balance to the autonomic nervous system, which is achieved by reducing the total stress/toxic load. When the toxic/stress load is reduced, time spent in fight or flight is reduced and then healing can begin.

The first step in this process is to identify all the toxins and/or stressors that put us in the sympathetic fight/flight state and remove them. This means you go through the list of all possible stressors/toxins and identify all your stressors and/or toxins and then address each one.



For example, candida overgrowth, nutritional deficiencies, impaired phase I or phase II detoxification, lyme, bacterial overgrowth, cavitation, mold mycotoxins, electro smog, heavy metal toxicity, oxidative stress, hypoglycemia, food sensitivities, poor diet, neurotransmitter and hormone imbalances, TMJ, pH, genetic polymorphisms, destructive relationships, financial struggles, loss of a relationship, loss of self are all potential stressors/toxins that would all need addressed. There are a variety of functional medicine tests that can assist in this process.

First and foremost, the environment in which you live must be free of common everyday environmental toxins like pesticides, air fresheners, disinfectants, perfumes, colognes, and other artificial fragrances and chemicals. Otherwise, you are thrust into the fight/flight sympathetic state continuously.

Many foods and food additives overstimulate the autonomic nervous system and activate the stress response system, like caffeine, chocolate, white flour, sugar, sugar substitutes, whole grains, food dyes, additives, preservatives, and all junk food. They should be avoided. The best diet for health, regardless of what health condition you face, resembles the Paleolithic Diet. [Entered on commonly available modern foods, the "contemporary" Paleolithic diet consists mainly of fish, grass-fed pasture raised meats, vegetables, fruit, fungi, roots, and nuts, and excludes grains, legumes, dairy products, refined salt, refined sugar, and processed oils. There are many different alternatives that are available to replace the foods that have been eliminated. For example, coconut oil can be substituted for butter, almond flour can be substituted for white flour, and honey can be substituted for other sweeteners.]

There are a variety of genetic polymorphisms that can impact the autonomic nervous system as well. For example, you may lack enzymes that allow you to methylate away norepinephrine which keeps you in a state of fight or flight. Methylation is important for metabolizing norepinephrine. If it isn't working properly, then norepinephrine levels become excessive. As we discussed previously, norepinephrine is the neurotransmitter that sets off the fight or flight response. Too much norepinephrine and you are not able to return to the parasympathetic state.

You may lack enzymes in the cytochrome P-450 enzymes known as phase I detoxification or in several of the phase II detoxification pathways like glucoronidation, acetylation and superoxide dismutases (SOD) that impair your ability to detoxify adequately and make you vulnerable to conditions like multiple chemical sensitivity, chronic fatigue or other degenerative health disorders. If these are identified, then steps can be taken to enhance them.

Pesticides can trigger the fight/ flight system not only because they set off xenosensors but also because they block acetylcholine from being recycled, a primary neurotransmitter overseeing regulation of the autonomic nervous system, which results in excessive levels of acetylcholine and constant triggering of the sympathetic nervous system. Pesticides also prevent tryptophan from being converted into serotonin, a neurotransmitter responsible for regulating mood that is needed to help turn off the stress response system.

The total toxin/stress load explains why some people get well and others don't. It also explains why such a wide variety of treatments are helpful. What improves the health of one person is not necessarily what works for another. In general, there isn't just "one" cause of MCS, CFS, FMS, Autism, Multiple Sclerosis, or any health condition. There are many.

The reason that some people get well by correcting their nutritional deficiencies, others get well with candida treatment, others with food sensitivities and others with meditation or biofeedback and while others with acupuncture or neural retraining and the like is because, when you reduce your total stress/toxic load enough, you are able to move out of fight/flight and back into the sympathetic state. Then healing can take place. Whatever moves you out of the sympathetic fight/flight and back into the parasympathetic is the magic key.

Let's say we have a bucket to put all our toxins and stressors into. Some people only have one or two toxins in their bucket, making their road to recovery may be quick and easy once identified or they find some technique that moves them into the parasympathetic zone. Say, for example, your total toxic/stress load consists of nothing but candida.

On the other hand, let's say your bucket is filled to the rim with toxins and stressors, then your road to recovery is likely to be very long and difficult. Some of us have two or three buckets. For the individual who has had numerous assaults like pesticides, mold, candida overgrowth, lyme, bacterial overgrowth, and nutritional deficiencies, the road is quite a bit different.

Some of these toxins/stressors are very resistant to treatment and difficult to overcome. People who have a genetic polymorphism are typically vulnerable for life, and pesticides can cause permanent damage to the phase I detoxification pathway. So some of us are able to turn off the sympathetic nervous system a little more easily than others.

The road to recovery is also greatly impacted by how many new toxic assaults you have along the road to recovery. For example, during the years I've been in recovery, I had non-amalgam dental fillings make me bedridden, skunk spray impair me for three months, mold contamination of my belongings, and pesticides from a neighbor prevented me from sleeping for a year, forced me to move, and destroyed most of my belongings. These instances were not only more damaging to me physically but also emotionally and financially traumatic as well. Anytime I made progress in improving my health, these things set me back significantly.

As anyone who has embarked upon this journey knows, it takes a great deal of persistence, determination, commitment, and will power to live. However, in general, the lower your total/stress load the easier the road will be for your recovery and at least some degree of improvement is seen as each stressor/toxin is addressed.

## The Detoxification System and Toxins

The second primary way toxins make us sick is through a faulty detoxification system.

If your detoxification system is working adequately, it eliminates the toxins you are exposed to (both internal and external) in a timely and effective manner. However, if it isn't working properly, then toxins get back logged in the body.

When toxins get back logged in the body, they get deposited in the brain, fat, tissues, cells, and organs where they can damage other organs and systems and wreak havoc on your mind and body for years to come. They may damage mitochondria, interfere in energy production, and damage the immune, endocrine, and nervous system.

An underperforming detoxification system is another stressor on the body, meaning it contributes to your total stress/toxic load and thrusts you into fight or flight. Yet, on the other hand, when one remains in the fight or flight states on a regular basis, this impairs the detoxification system as the body does not have the resources needed to deal with detoxification.

Thus if you can get your body and mind back into the preferred parasympathetic state with some other techniques, the detoxification system can work more efficiently; or if you improve the functioning of your detoxification system, you'll eliminate the toxins stored in your body that are keeping you in the state of fight or flight and thus restore balance to the autonomic nervous system. It goes both ways.

There are two phases in the detoxification system where problems may arise, phase I or phase II. Phase I prepares the toxin to be excreted, called oxidation; and phase II attaches another substance to the toxin to be excreted through the feces or the urine, called conjugation.

Phase I consists of a group of enzymes called cytochrome P-450. Phase II consists of a variety of conjugation pathways known as acetylation, glutathione, glucuronidation, sulfation, methylation, glycation and taurine.

The detoxification system becomes impaired for three primary reasons: it is overloaded with too many toxins to deal with, and/or it is missing the nutrients it needs to function adequately, or the individual has a genetic polymorphism in phase I or phase II detoxification. It is often a combination of all three.

For example, heavy metals impair phase II methylation, toxins from bacteria can impair phase II glucuronidation and pesticides, inhibit an enzyme called acetyl cholinesterase, which prevents our primary neurotransmitter, acetylcholine, from being broke down. This results in an excessive level of acetylcholine. Acetylcholine is the neurotransmitters that regulate our fight or flight as well as the brain, muscles and nerves. An excess of acetylcholine results in overstimulation of the sympathetic nervous stem, thus keeping one in an ongoing state of fight or flight.

Pesticides also cause phase I to be up regulated and phase II to be down regulated, which means that the body can't get rid of the toxin that has been oxidized. The oxidized toxin is actually much more toxic than the original toxin, so it is essential that phase II is able to keep up with phase I.

Not only that, pesticides also inhibits the conversion of tryptophan into serotonin, another primary neurotransmitter needed to keep the autonomic nervous system in check, as well as regulating our mood. Pesticides can also cause permanent damage to the cytochrome P-450 enzymes.

According to Dr. Sherry Rogers, detoxification may also become backlogged because there are some toxins that the body is simply not capable of dealing with, because the detoxification system does not have a mechanism available to handle that type of toxicity.

All toxins put an excessive burden on the detoxification system, because, to excrete the sea of toxins we are all exposed to every day, it uses up all our nutrients in reserve. Additionally, most people are eating a diet that is void of nutritional value; therefore, they don't consume the nutrients needed to have a healthy mind and body in the first place. Nutritional deficiencies are abundant in the general population.

Both phase I and phase II detoxification may be inhibited by diet and nutritional deficiencies as they both need a variety of minerals, amino acids, fatty acids, vitamins and antioxidants to function properly. Therefore, eating a healthy diet and correcting nutritional deficiencies are of major importance in the road to recovery, regardless what health condition you have.

For example, the cytochrome P-450 enzymes require a wide array of nutrients to function properly like copper, zinc, magnesium, manganese, vitamin C and the B vitamin group.

Phase II detoxification also requires an abundance of nutrients to run efficiently. For example, methylation needs an abundance of B12, folic acid, methionine and B6. Glutathione needs glutathione. A deficiency in glycine would impair glycation and a deficiency in sulfur would impair sulfation. A deficiency in B5 or molybdenum and acetylation will not work adequately.

Additionally, there can be a variety of genetic polymorphisms in the cytochrome p-450 enzyme and in acetylation, methylation and glucoronidation where the individual is missing crucial enzymes needed to detoxify. Thus their systems are much more vulnerable to toxicity. People with chemical sensitivities, MCS, often have a genetic polymorphism in CYP2E1 and CYP1A1, but there may be others. People who are intolerant of prescription drugs often have a polymorphism in CYP2D6.

What we see here is that the toxins themselves impair the detoxification system; but a detoxification system that is not working properly for other reasons, can make one vulnerable to toxicity and develop health conditions that would not have developed if

the system were up to par in the first place. To improve the detoxification system, the toxins (both internal and external) must be reduced and the functioning of the system must be improved.

Functional medicine testing can be used to identify the weaknesses in your detoxification system, and then it can be improved with diet, lifestyle changes and nutritional supplements.

Now, granted many people with MCS, CFS, EMF etc. have engaged in detoxification until the cows come home and have not made a complete recovery or seen many results. Obviously, we are missing something here. This method apparently does not have the complete picture either.

However, there are a variety of reasons one doesn't see progress with detoxification and nutritional supplements. Partly, it can be because they didn't have the proper testing to really identify what it is in their unique biochemistry that needs replenished to get the detoxification system working. They may not have had the genetic testing to identify the genetic problems.

They may not have a physician that has the level of expertise that is needed to suggest the appropriate tests or to identify their weaknesses accurately. Testing and supplements are expensive, and many people cannot afford to do all that is really needed to get to the bottom of the issue.

For one reason or another, they have not found all the pieces of the puzzle that will push them out of the sympathetic fight or flight and into the parasympathetic state where healing can take place.

Additionally, when the body is in the degenerative, sympathetic state then the detoxification system also becomes impaired. Once again, we have another catch 22. An impaired detoxification system from an overload of toxins will put the body into the sympathetic state; yet, on the other hand, if we remain in the fight/flight for an extended period of time, our ability to detoxify is reduced. Thus, once again, the goal in recovery must cover both the bases.



We must reduce exposure to toxin so that the autonomic nervous system can return to the parasympathetic state and enhance the detoxification system, and also improve autonomic nervous system function so detoxification can improve. Again, it goes both ways; environmental clean-up, internal cleanup of toxins from organisms, healthy diet, nutritional supplements and exercise on one hand, with deep breathing exercises, mindfulness meditation, yoga, or any alternative method that turns off the sympathetic nervous system are required. One may be able to get into the parasympathetic regenerative mode through any or all of these paths.

### **Toxins Target the Frontal Lobes of the Brain**

When the sympathetic fight/flight system is activated for any reason due to toxins or emotional stress, the frontal lobes of the brain are triggered as well to cope with the stressful event. Serotonin, dopamine, GABA, endorphins/enkephalins, etc. are released to inhibit the Locus Coeruleus, amygdala, thalamus, hypothalamus, and thus balance the fight/flight system. If the frontal lobes aren't working properly, then fight or flight cannot be regulated properly. You stay in fight/flight all the time.

Serotonin, dopamine, GABA, endorphins/enkephalins, endocannabinoids, taurine and histamine are neurotransmitters that all oppose norepinephrine. Thus they turn off the sympathetic fight or flight system. They are released during times of stress to bring us back to the parasympathetic state.

However, the problem is that toxins target the frontal lobes of the brain, thus inhibiting them from doing their job of helping us cope with the total stress load.

For example, heavy metals, pesticides, candida yeast, food sensitivities, cavitations, lyme and psychotropic medication all impair normal function and/or production of dopamine and serotonin, two very important neurotransmitters needed to regulate mood and the sympathetic nervous system. Pesticides inhibit the enzyme acetyl cholinesterase, which causes a buildup of acetylcholine, the neurotransmitter that runs our autonomic nervous system, thus resulting in a constant firing of the sympathetic nervous system.

However, it doesn't matter what the toxin is, be it mold mycotoxins, food sensitivity, lyme, gut, cavitations, heavy metals, pesticides or psychotropic street drugs or prescription medications. Each and every one of them target the frontal lobes of the brain.

Not only does this frontal lobe damage keep the body in the sympathetic state, but it also results in diminished levels of neurotransmitter production and function, which compounds the problem even further. Our inhibitory neurotransmitters like dopamine, serotonin and GABA and hormones like cortisol and DHEA that are used for coping can't keep up, so they begin to diminish and are not available to us when we need them.

Insufficient or out of balance neurotransmitters and hormones result in a long list of disruptive and sometimes debilitating symptoms like anxiety disorders, depression, hyperactivity, insomnia, impaired memory, learning, concentration, and more.

As we mentioned earlier, cortisol is a hormone that the adrenal glands release to help us cope with stress. When the body remains in the sympathetic fight/flight for too long, then cortisol levels can become depleted. This perpetuates the problem even further. Not having enough cortisol then puts even more stress on the body and thrusts you deeper into fight or flight.

If this cycle continues for too long the neurotransmitters and hormones burn out. Cortisol burnout leads to adrenal fatigue which is commonly labeled as chronic fatigue syndrome.

Toxins not only trigger your sympathetic nervous system thrusting you into fight or flight, but they also impair your built-in, back-up system that is supposed to help you cope with the stress process and thus prevents you from returning to the parasympathetic state.

Additionally, the frontal lobes will also not work adequately if they are not receiving the proper nutrients needed for production, function and transmission. Neurotransmitters and hormones cannot be formed or function properly if the body is missing crucial nutrients like amino acids, fatty acids, B vitamins, and minerals. Once again we see the importance of assessing and replenishing nutrient status. The more dominant the sympathetic nervous system is likely to become the more deficient you are likely to become.

The goal in recovery of the frontal lobes is two-pronged. On one hand, you must reduce the toxins you are exposed to so that the frontal lobes can begin working properly again. You must also engage in therapies that help increase frontal lobe activity like deep breathing exercises, mindfulness meditation, yoga, art, music, humor, spending time with nature, meaningful relationships, biofeedback, nurturing movies, and writing; anything that is nurturing and soothing. Neural retraining or limbic system retraining is proving to be helpful in this process as well.

We must reduce the toxins we are exposed to, while simultaneously trying to increase frontal lobe activity that will help us return to the parasympathetic state. Frontal lobe health must be supported with a diet high in protein for amino acids as amino acids are the building blocks for neurotransmitters, a healthy diet, nutritional support, and activities like mindfulness meditation, deep breathing exercises, and time with nature.

The ability to inhibit the sympathetic nervous system (Locus Coeruleus, excessive norepinephrine, and amygdala) and thus reduce chronic stress burnout from excessive fight or flight is dependent on the health of your brain. To create a healthy brain, it needs nutrition, good diet, detoxification, and exercise. Yes, just like your body, your mind needs exercise; but brain exercise is achieved through mindfulness, meditation, deep breathing, visualizations, neural retraining, etc.

## **Inflammation and Oxidative Stress**

If you are exposed to a lot of toxins, then there is increased oxidative stress from phase I detoxification to detox these toxins. Oxidation of the toxins burns. Therefore, high levels of oxidation lead to inflammation (pain, swelling, redness). High levels of oxidation tear up your tissues. This is similar to the oxidative stress that we experience when our immune system protects us from threats like viruses, bacteria, etc. It also increases inflammation.

Both instances cause an increased level of oxidative stress and increased levels of inflammation. It is the oxidation that is at the root of many generalized systemic inflammatory disorders like Fibromyalgia, arthritis etc. An ironic side-effect of what the body must do for itself is to survive.

The more toxins you are exposed to the higher the level of oxidation and the higher level of inflammation are likely to be. The more infections you have to fight off, the higher your oxidation will be and the more inflammation there is likely to be.

When you have both a high level of infections and high levels of toxin exposure, then double the oxidation and inflammation.

Say, for example, you have h pylori, candida overgrowth, lyme, or parasites, each of these emits toxins that the body must detox. Additionally, they trigger the immune system to protect it. Therefore, with these kinds of infections, you are getting oxidation from the toxins and the immune reaction--another double whammy resulting in inflammation.

The moral of this part of the story is that--

Toxins = oxidative stress

Toxins = inflammation

So healing from toxicity involves not only healing from the toxin itself but also from the oxidation as well.

High levels of antioxidants, like C, E, and Coq10 are needed to contain the burn and to reduce the inflammation. Antioxidants are also anti-inflammatories because they reduce both the oxidation and the inflammation as a result.

## **Immune System and Toxins**

One of the ways toxins impact the immune system is through the development of haptens. A hapten is a small molecule that can illicit an immune response only when attached to a large carrier such as protein, similar to an antigen. Typically, only large



molecules, infectious agents, or insoluble foreign matter can elicit an immune response in the body. However, when the hapten attaches itself to the larger protein, it is then enabled to do the same. Haptens then make proteins of self-look-like foreign invaders, causing the immune system to attack itself. Thus we have autoimmune disorders.

After the body has produced antibodies to fight off the hapten, the hapten may also attach itself to the antibody. Alternatively, it may block an immune response to the carrier of the hapten, called hapten inhibition.

Many toxins, bacteria, viruses, etc. can have a hapten effect. When haptens occur, it takes very little of the toxin to set off the immune response or the sympathetic nervous system. For example, lyme, heavy metals, candida yeast, mold, bacteria in a cavitation or the gut, halides, pertussis vaccine, babesia, malaria and pesticides are all known to have a hapten effect. The toxin that is oxidized in phase I detoxification becomes the hapten.

This immune stress then triggers the sympathetic nervous system, and the body is in fight or flight.

One of the most common conditions associated with haptens is autism. It is believed that autism is often triggered by the hapten effect of mercury, and not the toxicity of the mercury itself. There are many other contributing factors to autism as well, like candida, nutritional deficiencies, impaired detoxification, etc. People with autism and people with MCS have striking similarities.

The thyroid and other glands are particularly vulnerable to haptens, and they often play a role in hashimotos. Then after the immune system attacks the thyroid for an extended period of time it leads to hypothyroidism.

This means that heavy metals, candida, or mold cause problems not only in their toxicity but also in their hapten effect, giving two different assaults from one toxin. For example, heavy metals can bind with iodine receptors, can impair neurotransmitters, can disrupt the endocrine system, impair methylation, and trigger an immune response with haptens. The same applies to halides like bromine, fluoride, and chlorine.

Toxins also weaken the immune system by the free radicals that are produced by oxidizing of the toxins. If there is a high level of toxins to be oxidized all the time, this will degrade the immune system.

The hapten effect explains why very small amounts of a toxin can trigger an immune response and the sympathetic nervous system. Many researchers get perplexed, saying that the amount of toxin is not enough to produce poor health; they are not taking the hapten effect into account. Sometimes it isn't the toxicity of the toxin that produces the symptoms, it's the haptens that disrupt the immune system and trigger the autonomic nervous system.

Sometimes, the hapten effect is not experienced until several exposures. For example, a child in a mother's womb gets exposed to mercury because the mother eats mercury laden fish all the time. Then a couple months later, they get a vaccine with mercury. The first exposure sensitized them, and the second exposure is a stronger hit to their system and sets off the hapten effect. Or sometimes it isn't until the third or fourth vaccination.

## **Psychotropic Toxins**

One of the most common and confusing toxins in our society and one that is often overlooked are psychotropic toxins. Psychotropic toxins are substances that alter the brain or, in other words, mind-altering or mood-altering substances. This would include both street drugs like marijuana, alcohol, cocaine, heroin, benzodiazepines, etc., and prescription drugs like Xanax, Prozac, Ativan, as well as sugar, caffeine, nicotine, chocolate, and carbohydrates, even complex carbohydrates like whole grains.(grains are just as addictive as drugs). Most of our society is dependent on at least one of these substances to get through the day because of the toxins in our environment that impair the autonomic nervous system.

Addiction is a both a symptom of toxicity and a toxin itself.

As we discussed throughout this paper, the autonomic nervous system and neurotransmitters in the brain are impaired from toxins and results in the vast amount of psychological and physiological symptoms like MCS, chronic fatigue, chronic pain, anxiety, depression, hyperactivity, headaches etc. This often pushes the individuals to reach for psychotropic toxins to feel better. The most dangerous aspect of psychotropic toxins is that they temporarily relieve your symptoms, thus tricking you into believe they are making you better.

Psychotropic toxins of all kinds mimic your natural neurotransmitters, serotonin, dopamine, endorphins/enkaphlins, endocannabinoids, GABA and acetylcholine, thus what provides the temporary relief in pain, depression, anxiety, energy, etc. For example, nicotine mimics dopamine and acetylcholine, marijuana mimics dopamine and endocannabinoids, alcohol affects serotonin, dopamine, endorphins and GABA, opioids mimic endorphins and dopamine, while benzodiazapines mimic dopamine and GABA.

They temporarily boost your neurotransmitters and turn off your sympathetic nervous system. However, the brain then responds by making less neurotransmitter because it thinks it has enough. Remember neurotransmitters are needed to cope with the total stress/toxic load. When they aren't present, they can't counteract norepinephrine and turn off your sympathetic nervous system.

Thus a vicious cycle ensues. When neurotransmitter levels drop lower, then you become dependent on the psychotropic substance to bring them back up. The more you turn to the psychotropic toxins, the more your neurotransmitters become depleted and the more dominant your sympathetic nervous system becomes. More and more symptoms

develop and mental and physical health continues to decline. Psychotropic drugs become a way of anesthetizing the autonomic nervous system.

Addicts of all kinds are unconsciously trying to restore balance to their brain chemistry, soothe their autonomic nervous system and find inner peace, which has been disrupted from toxins or stress, by using psychotropic chemicals to artificially stimulate their neurotransmitters.

Like all other toxins, the psychotropic toxins must be removed in order to return to the parasympathetic state. There cannot be improvement in psychiatric or physiological health if one remains dependent on psychotropic. Psychotropic take the brain, which is the captain of the ship for the autonomic nervous system, out of the ball game.

As we discussed in the frontal lobe section of this page, the frontal lobes and the associated neurotransmitters, serotonin, dopamine, GABA, taurine, acetylcholine, endorphins/enkephalins are needed to deal with stress, inhibit the Locus Coeruleus, excessive norepinephrine, the amygdala and regulate the sympathetic nervous system. Psychotropic impair this process. Without these neurotransmitters, we cannot turn off fight or flight.

However, one's ability to give up the psychotropic toxins is highly dependent on the diet they eat, their nutritional status and the amount of toxins, both internal and external they are exposed to as each of these issues disrupts neurotransmitters and triggers the autonomic nervous system. Once again, we see how recovery requires that the toxins be eliminated, the diet improved, and the nutrients replenished.

### **Spiritual Health and Toxins**

Nothing is unscathed by toxins; even our spiritual health is impacted. By spiritual I am referring to the level of meaning and purpose we have in life, our level of inner peace, and our relationship or connection with self, others and the Universe.

It is very difficult to feel spiritually connected and maintain inner peace when you have depleted neurotransmitters and are continually in a state of fight or flight. Thus your level of spiritual health can be greatly influenced by the state of your autonomic nervous system and frontal lobes. Many of the common spiritual practices, like meditation, that can enhance our health and life, may be difficult to embrace in this debilitating state.

This too is very much connected to toxicity and detoxification. For example, individuals who have a genetic polymorphism in their methylation gene, called catechol-O-methyltransferase, which would result in a reduced capacity to eliminate norepinephrine and toxins that results in an overstimulated sympathetic nervous system, often have difficulty with meditation.

On the other hand, like most aspects we have discussed in this paper, inner peace and spirituality is a two way street. If you can increase your meaning, purpose, inner peace

and connections to self, others and the Universe, this boosts neurotransmitters and has a soothing effect on the autonomic nervous system. Thus will help move you into the parasympathetic zone and promote healing.

Once again, we see the two prongs of recovery. On one hand, toxins must be reduced, nutrients replenished, the detoxification system improved while, at the same time, engaging in practices like meditation, deep breathing exercise, time with nature, music, yoga, etc. to improve frontal lobes and reduce sympathetic dominance.

### **Childhood Abuse or Other Emotional Traumas**

Childhood abuse and neglect or other strong emotional traumas like war, domestic violence, living in poverty, a car accident, witnessing a murder, death of a love one or surviving a natural disaster, living with a chronic and degenerative health condition, impair the brain and the autonomic nervous system in the same manner as toxins and thrust the individual into fight or flight response and deplete neurotransmitters.

These are intensely stressful situations that trigger the Locus Coeruleus to release norepinephrine that triggers the amygdala that triggers the hypothalamus and so on and so forth as described in the opening paragraphs of this discussion. The impact of childhood abuse on the brain, the endocrine system, and the limbic system has been studied extensively by Dr. Martin Teicher, Dr. Bruce Perry, and others. I've written about this topic in more depth below, "Effects of Child Abuse."

However, my point in bringing it up in this discussion is to make you aware that, if any of these situations apply to you, they may be the root of what made your autonomic nervous system vulnerable to dysfunction in the first place.

For example, I lived with severe emotional, sexual and physical abuse as a child. I believe that was my original trauma that damaged my autonomic nervous system, thrusting me into fight or flight and set me up for all the chronic health conditions that followed. My MCS began when I was 17.

### **New on the Scene**

There are some new and controversial approaches on the scene called brain training to heal MCS, CFS, FMS, EHS and other similar conditions associated with toxicity. They are also referred to as neural retraining, limbic retraining or amygdala training that are proving to be helpful for many people in returning the mind and body to the parasympathetic state.

The point you want to keep in mind is that both the Amygdala Retraining™ and the Dynamic Neural Retraining System™ are effective for the same reason that any other treatment method for MCS, CFS or EHS works; because they enable the individual to return to the parasympathetic state, which in turn enables the detoxification system to function properly. They are stimulating your frontal lobes, helping you make more of

your coping and healing neurotransmitters and hormones and turning off the fight or flight response.

These programs use a variety of techniques like neuro-linguistic programming, visualizations, meditation, positive affirmations, self-hypnosis, yoga, and others to achieve that goal.

This does not mean that toxins are not harmful to us or that all the other contributing aspects that have been well researched and documented, like genetic polymorphisms in the cytochrome P-450, impairment in phase II detoxification, nutritional deficiencies, eating a healthy diet, addressing candida, living an environmentally friendly lifestyle etc., should be thrown out the window.

Both of these brain retraining programs mentioned above are basically saying that people with MCS, CFS, EHS and other similar conditions have trauma in the limbic system area. In a nutshell, trauma from chemicals or other forms of stress have resulted in pathways in the brain that keep us in a state of over activity of the sympathetic nervous system. It's a little more complicated than that, but that's the basic idea.

Additionally, limbic system rewiring or retraining the amygdala works by using your neurotransmitters to form new pathways in your brain and turn off the overactive sympathetic nervous system. As mentioned previously, neurotransmitters and the autonomic nervous system are depleted and disrupted by all the factors we've just discussed.

Therefore, if one does not have adequate neurotransmitters because of nutritional deficiencies, heavy metal toxicity, candida, parasites, bacterial overgrowth, lyme, frequent exposure to environmental toxins, genetic polymorphisms etc., they may not have enough neurotransmitters to form new neuronal pathways and their ability to rewire the brain and turn off the sympathetic nervous system can be impacted.

Each of these factors is perceived by the body as stress. Stress depletes your neurotransmitters. For those who are not seeing very good results with retraining the amygdala or neural retraining, this is probably the reason why. People who are able to get well quickly with these programs are likely to have fewer stressors, while those who take a long time have more stressors. If it doesn't work at all for you, then you likely have a bucket that is too full of stressors.

Furthermore, as illustrated in my discussion above, the brain and the autonomic nervous system are impaired because of the toxins. Not only that, environmental toxins impact our health in many other profound ways besides MCS, CFS, etc. They lead to other conditions like Parkinson's, Alzheimer's, autism, cancer, heart disease, depression, anxiety disorders, and many others. A poor diet and nutritional deficiencies also lead to a host of other health conditions like cancer, insulin resistance, type 2 diabetes, obesity, and heart disease and addiction to name only a few.

At least some degree of environmental clean-up and healthy eating should always be practiced. The castle you come home to should always remain as chemical free as possible, and the food you put in your temple should be as wholesome as possible if you want to maintain long-term health. However, what we want to accomplish in healing is to achieve balance so that we may interact with the world once again and live a more full, productive and satisfying life. We don't need "extreme" avoidance of chemicals to live.

I know without a doubt that all the aspects I have discussed play a role in MCS, CFS and FMS as I have experienced these conditions personally. For example, when my candida overgrowth levels were high or if I have a flare, then my level of chemical sensitivity goes through the roof. I am a completely different person if I don't eat a healthy diet.

Improving my acetylation detoxification pathway helped me immensely be able to tolerate terpenes in the desert and perfumes when I go out and about. Improving my glucuronidation pathway helped immensely with lowering my estrogen dominance and lowered my level of chemical sensitivity. Addressing a deficiency in Vitamin B6 and magnesium helped reduce stress significantly, alleviate muscle pain and spasms and heightened my overall sense of well-being.

Changing my diet, clean-up of the major environmental toxins in the household, and exercise completely eliminates my Fibromyalgia pain and eliminated my child's ADHD by 90%. I overcame drug addiction, alcoholism, sugar addiction, food binging, anxiety attacks and clinical depression more than 20 years ago by simply making changes in diet and living a green lifestyle.

My son improved his MCS and CFS by about 60% simply by making changes in diet, altering his exercise routine, getting more sleep, replenishing some nutritional deficiencies and living environmentally friendly.

No, I did not find the "magic key" with any of those methods that pushed me up over the fence and into the winners circle as far as MCS and CFS go, but I made progress in the race.

On the other hand, over the years I have also found that mindfulness meditation, deep breathing exercise, nurturing movies, relaxation music, and time with nature, gratitude and humor are all very helpful for turning off my sympathetic nervous system. So I have experienced both sides of this spectrum.

I have personally been using the Dynamic Neural Retraining program myself for about 6 months and just bought the Gupta program a couple weeks ago and as of July 1, 2012, I have achieved about 25 percent improvement in my MCS and CFS. I have come to believe that both of these programs are powerful tools for healing that should be explored by everyone with these conditions. You can read my review of these programs and get a better understanding of what it means to rewire the brain on my limbic system retraining page.

I believe that Annie Hopper and Ashok Gupta's limbic system retraining programs have a great deal of merit and potential for healing. I feel very excited about all that they are bringing to the table. However, I think it is dangerous and irresponsible on many levels to ignore the toxicity factor, the healthy eating factor, the nutritional deficiencies factor and all the other aspects I have presented on this page. I believe that limbic system retraining is indeed a very important missing piece of the puzzle, but I don't believe it is the whole kit and caboodle, in and of itself.

Also keep in mind, that most of the participants in both of these programs have had MCS and CFS for a very long time and therefore they have already engaged in years of detoxification, living an environmentally clean lifestyle, eating a healthier diet, and addressed their nutritional deficiencies, thus their autonomic nervous system is primed for healing. It is my opinion that is the combination of all these factors that helps make us so responsive to limbic system retraining.

In my opinion it is not an either or situation. As I see it, MCS, CFS and other similar conditions definitely involve limbic system impairment, but it is also a matter of detoxification, nutritional status and genes etc. They are interconnected and really one cannot be separated from the other.

Limbic system retraining and detoxification methods do not oppose one another. One approach does not cancel out the other; they are just coming at it from different angles. As I see it, they fit together like a glove. For example, I have used my limbic system retraining to enable me to take a variety of nutritional supplements I wasn't able to take previously and correct some long-standing deficiencies.

It is my opinion that if you use one of the limbic retraining programs, it should be one component of a comprehensive healing plan, not the "sole" plan.

### **How to Protect Yourself from Toxins**

When we look at all the factors that we have discussed in this paper, we see that toxins weave a very complex and multi-faceted web that must be unraveled in order to restore balance to autonomic nervous system and improve health. Dr. Charles Gant brilliantly calls this the "web of distress." Although we all share common strands, the web is not necessarily the same for each individual.

We also see how toxins impact our life on every level. The total stress/toxic load is toxic, emotional, oxidative, spiritual, neural, inflammatory and cognitive. It may impair us socially, physically, emotionally, academically, athletically, occupationally, sexually, spiritually and interpersonally.

Recovery requires that we move out of the sympathetic fight or flight mode and into the parasympathetic which is accomplished with a holistic and comprehensive plan that reduces environmental exposures, provides a clean and healthy diet, replenishes nutrients, improves the detoxification system and a variety of other practices to assist the autonomic nervous system like mindfulness, mindfulness meditation, deep

breathing, biofeedback, neural retraining or any practice that turns off the sympathetic nervous system.

If you only address the detoxification system and ignore the autonomic nervous system, you are missing an important component and vice versa.

Then, because we live in a toxic world, to maintain any improvement in health that is achieved, it requires a commitment to lifelong changes in diet and lifestyle in order to keep your total toxic/stress load from getting too high gain.

If you return to bathing yourself in toxins and eating a poor diet, then degradation of health is inevitable.

## **Links**

### **Dr. Gant, M.D.**

<http://www.nihadc.com/practitioners/dr-charles-gant-md-ph-d.html>

### **Academy of Functional Medicine**

<http://www.academyoffunctionalmedicine.com/>

### **Gupta Amygdala Retraining**

<http://guptaprogramme.com/>

<http://guptaprogramme.com/html/explainMCS.asp>

<http://www.chronicfatiguetreatments.com/wordpress/treatments/amygdala-retraining-gupta-program-interview/>

<http://www.het-abc-van-mcs.nl/mcs-recovery.htm>