

Total Toxic Load

Toxins are chemicals that damage bodily tissues, interfering with normal biologic processes in our bodies. Toxic chemicals include medications such as cimetidine, estrogen, and antibiotics, pesticides, food additives, adhesives, and solvents. The origin of toxins can be divided into two groups. Those that are derived from internal bodily processes, and those that come from external sources. Total Toxic Load (TTL) describes the summation of internal and external toxins. The concept of TTL suggests that toxin accumulation can compromise the normal physiologic functioning of the body. Literature suggests an association between impaired detoxification and premature aging, cancer, Parkinson's disease, chronic fatigue syndrome, and fibromyalgia.

High levels of bodily toxins, or toxemia, have synergistic effects, causing a greater degree of damage than a singular toxin alone. This multiplicity of toxin effects has been clearly elucidated in an animal study using mercury and lead. In this study, scientists administered just enough lead to kill one percent of the test subjects. They did likewise with mercury. But when they administered the same amounts of *both* lead and mercury, all of the animals died. With regard to the extent chemicals disrupt human physiology, we know very little. Virtually all testing conducted on man-made chemicals are performed on each individual toxin. They are also only tested in animal models that may have questionable correlation in humans.

It would seem that what governmental health agencies consider safe levels of singular toxins, may not be harmless when determining the safety of the numerous chemicals to which we are exposed.

Internally-Derived Toxins

There are two classes of toxins originating from within our own bodies: those from an imbalanced metabolism, and toxins produced by gastrointestinal organisms.

?? Imbalanced Metabolism

There is substantial diversity in human genetics. As different as each of us is in appearance, so too are we in the genes that control our internal physiology. This characteristic explains why an individual leading a healthy life will develop cancer, while another lives into his/her nineties smoking and drinking for decades.

Genetic research is demonstrating that each of us may have numerous genes that inadequately conduct the body's biologic affairs. One such genetic defect involves the accumulation of homocysteine, a compound that can damage the vascular system and contribute to heart disease.

Homocysteine is involved in the metabolism, or breakdown, of sulfur-containing amino acids. This process requires the proper activity of numerous enzymes that initiate the chemical reactions. Enzymes are produced by specific genes. If you happen to be one of the unlucky individuals with a faulty gene that encodes for these enzymes, you will have preponderance for the accumulation of homocysteine. Vitamin B12, B6, and folate are intimately involved in this reaction as well. This phenomenon will be amplified if your diet is deficient in the dark green leafy vegetables that are high in these vitamins. A change in diet, and the supplementation of B12, B6, and folate will decrease homocysteine levels. This example clearly demonstrates how a combination of weak

genes and poor diet and nutrition can result in the accumulation of toxic compounds within the body.

There are hundreds of such genes that influence the ability of the body to conduct the biologic reactions necessary to sustaining life. Some of the most important are the enzymes produced in the liver for the purpose of breaking down and eliminating toxic compounds in general. The detoxification pathways in the liver have been identified and the enzymes required to complete each set of chemicals reactions are understood. As is the case with the homocysteine scenario, some of us have genetic errors that produce a less than desirable amount of these detoxification enzymes. We are then biologically inclined to have more toxins in our systems, permitting these compounds to have deleterious effects on tissues and organs. The antifungal drug, ketoconazole, is known to inhibit the first phase of liver detoxification. If an individual is lacking in one or more of the enzymes in this system and uses ketoconazole, he/she will experience many more damaging side effects than a person with an intact detoxification system will.

Under normal physiologic circumstances toxic compounds are produced within the body. Most persons have subtle defects in genes that code for biologic reactions. Under certain circumstances, such as with the use of pharmaceutical drugs, the body cannot cope with the amount of harmful chemicals, and an increased Total Toxic Load will result.

?? Gastrointestinal Bacterial Metabolism

There are over 400 species of bacteria that reside in our intestines. Bacterial colonization occurs at birth with the inoculation of the child by the mother's vaginal and fecal organisms. During the first several years of life the organisms in the intestine achieve a balance whereby healthy or beneficial bacteria outnumber the pathogenic or disease-causing bacteria. Healthy bacteria produce vitamins, lower pH to inhibit parasite growth, and produce short chain fatty acids, compounds that are important in nourishing the lining of the intestine. Unhealthy bacteria produce toxins that can damage the intestine, and are absorbed into the bloodstream thereby increasing Total Toxic Load. Damage to the lining of the intestine is known as Leaky Gut Syndrome, and has been associated with numerous diseases. Over the course of a lifetime, the intestinal tract processes more than 25 tons of food, which represents the largest load of potential toxins confronting the human body.() Achieving bacterial balance is critical for health, and if it is not maintained chronic diseases can result.

A dysbiosis is an imbalance in the intestinal flora (bacterial organisms). Antibiotics, impaired immunity, a poor diet, and exposure to pathogenic bacteria can result in a dysbiosis. Yeasts (candida), parasites, and unhealthy bacteria capitalize on the altered intestinal environment resulting from imbalance. All of these opportunistic organisms produce toxic compounds that are absorbed into the bloodstream. Dr. William Shaw, at the Children's Mercy Hospital in Kansas City, Missouri, has discovered metabolites of fungi (yeast) and bacteria in the urine of patients with various neurological conditions such as depression, multiple sclerosis, psychosis, and autism.

Toxic compounds that are produced by unhealthy bacteria, fungi, and other parasites add to the body's Total Toxic Load, burdening the liver with an increased detoxification workload.

Externally-Derived Toxins

Chemicals that are derived from outside of the body are termed *xenobiotics*. Xenobiotics can have profound, adverse effects on bodily tissues and organs. A study in the December 5, 1998 issue of *The Lancet*, found a dose-dependent relationship between dieldrin and breast cancer. Dieldrin is a pesticide that was used in the US for many years, and continues to be used throughout the world. The results of the study clearly demonstrate that the more dieldrin within your body, the higher your risk for getting breast cancer. Many xenobiotics mimic estrogen and are termed *xeno-estrogens*. The significance of xenoestrogens is that they have a high affinity for estrogen receptors that are located on breast cells, and they are fat-soluble. In other words, once these compounds are in your body, they do not like to leave and preferentially attach to breast tissue, where they exert cancer-causing effects. These toxins also affect men by elevating overall estrogen levels, relatively diminishing testosterone levels. Many xenobiotic compounds are stored in fat tissue, and can reside there for decades. Due to the ubiquitous nature of these compounds, most persons have over forty synthetic chemicals in their bodies at any given moment.

Sources of externally derived toxins include:

- ?? Herbicides
- ?? Illegal drugs
- ?? Prescription drugs
- ?? Food additives including coloring agents
- ?? Pesticides
- ?? Fungicides
- ?? Alcohol in beverages and solvents
- ?? Volatile organic compounds such as formaldehyde, trichloromethane, and vinyl chloride
- ?? Heavy metals including mercury, arsenic, cadmium, lead, and aluminum

Heavy Metals

Special attention must be given to heavy metals due to the significant effects these toxins have on human function. Evidence demonstrates the ability of metals to impair brain function, and they are likely culprits for impairing the cardiovascular, neurological, gastrointestinal, and urological systems. Even small amounts of these toxins can have deleterious effects. A study in 1999 found that patients with cardiomyopathy (a type of heart disease) had blood mercury levels 22,000 times greater than that of normal test subjects. Blood levels of antimony were 12,000 times, and gold 11 times higher than control subjects. Other studies have made correlations between mercury fillings, a source of mercury accumulation in other bodily tissues, and autoimmune diseases and heart attacks. Levels of hair mercury levels were significantly higher in multiple sclerosis patients than in persons without the disease.

Lead accumulation is another example of chronic heavy metal exposure. Hair analysis, an effective means to identify chronic metal exposure, has made a connection between lead levels and reduced intelligence scores and achievement scores in children. Lead has also been associated with hyperactivity, delayed learning, fatigue, behavioral problems, headaches, insomnia, and loss of appetite.

Prescription Drugs

For many, the use of medications can be a significant source of externally derived toxins. Increasing the Total Toxic Load with these drugs can be especially frustrating, because the dominant healthcare system in the West is so reliant on pharmaceutical therapies. Most medical doctors downplay the hazards inherent with these chemicals, because in medical schools it is what they are taught. The use of such powerful drugs is tempting. Much of the time they provide quick relief from numerous ailments, but at a cost. The majority of pharmaceutical medications provide symptomatic relief, allowing a person to ignore their body's plea for help. After all, symptoms that are experienced by a person are the initial signs that something is not quite right in the body, and when this communication is ignored, health will only deteriorate. And all drugs have to be broken down by the liver, thereby increasing this organ's burden. If your liver is busy detoxifying medications, it cannot effectively remove other toxins, and the Total Toxic Load will increase. This is the cost for dependence on drugs. The substantial growth of alternative medicine is due largely to the dissatisfaction with these therapies that do not support health.

Decreasing Total Toxic Load

At this point in your reading you may feel frustration and hopelessness, believing that toxins are unavoidable. Although in man's arrogance and ignorance we have ultimately poisoned the very home in which we live, there are numerous methods to effectively diminish our toxic load. If we are to live healthy and vital lives, it is critical that we limit toxins and maximize the ability of our bodies to perform normal physiologic functions. Performance is what the body is designed for. Within each body are the mechanisms to sustain life, and all that is required is a level playing field. The 10 recommendations below are techniques to assist your body in maintaining optimum performance.

1. Avoid chemicals used in food processing by eating a whole foods diet.
2. Increase your intake of diverse vegetables. Dr. Nick's Vegetable Mix is a practical way to achieve this. Many vegetables are natural blood purifiers, aiding in toxin elimination. Research suggests that the chemicals in plants can increase the detoxifying ability of the liver. They also contain an abundance of vitamins, minerals, and plant chemicals that are known to diminish numerous diseases.
3. Practice periodic fasting. Fasting, especially water-only fasts, is the best way to detoxify the body. Digestion is one of the most labor-intensive processes the body undergoes on a regular basis, and the ingestion of food allows a variety of substances to gain entry into the bloodstream. Many of these substances are not used by the body and have to be eliminated by the liver, the skin, and the lymphatic system.
4. Use blood-purifying herbs to cleanse the blood. Many of these herbs actually allow the liver to detoxify the blood more effectively, as well as protect the liver from damage. Some of the herbs proficient in this ability are milk thistle, green tea extract, curcumin, bromelain, ginkgo biloba, gingerroot, and grapeseed extract. Most of these herbs are also potent antioxidants. Dynamic Wellness' Herbal Antioxidant Support contains all of these herbs.

5. Drink at least 10 glasses of water each day. Water flushes toxins out of the body by way of the kidneys. Steam distilled water is recommended.
6. Eliminate coffee, soda, tobacco, and alcohol. These substances only serve to increase the toxic burden to the body.
7. Treat Leaky Gut Syndrome if suspected. This is accomplished primarily through diet, L-glutamine, butyric acid, and by maintaining healthy intestinal organisms with the supplementation of *Lactobacillus acidophilus*.
8. Minimize exposure to pharmaceutical drugs. Many medications we take are to mask the symptoms of an unhealthy body. If we focus on cleaning up our diets, most medications can be minimized, or eliminated altogether. Remember that changing the way in which our body functions is a slow process. It can take many months before being rewarded with perceived health.
9. A well-balanced multivitamin/multimineral formula supports the body's chemical processes, including liver detoxification. These nutrients cannot be easily obtained with the average diet.
10. Regular exercise helps optimize internal physiology. The perspiration resulting from vigorous exercise also is a useful way to eliminate toxins through the skin. Dry sauna use can also facilitate this process.