

## DETOXIFICATION, A VITAL IMPERATIVE

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Detoxification is the second core physiological process in Dr. Jeffrey Bland's, The Disease Delusion. (See previous articles.) It is covered extensively also in Clean, Green, and Lean, by Dr. Walter Crinnion, N.D., who has extensive experience helping patients detoxify and recover from many chronic illnesses.

This essential process is a normal function for the constant removal of by-products of normal (and abnormal) metabolism, fermentation products from gut bacteria, dead cells, dead bacteria, used hormones, substances in the foods we eat but cannot be used, as well as poisons we take in from the outside.

If detoxification is a regular, normal process, why worry about it?

First, if we don't detoxify, we get sick.

Second, we have many genetic variations in our ability to detoxify, and nearly everyone has some deficiency in detoxifying certain substances. These areas can be strengthened with good nutrition and supplementing with natural substances.

Third, the very detoxifying process itself is subject to obstruction and damage by an overload of toxins, from inside the body, from external chemicals, and from drugs. Superhighway vehicular traffic flow is slowed by a change to a single lane from 3, and it can be totally obstructed by a collision resulting from the sudden change. Likewise an overload of poisons can create similar havoc in the body's attempt to clear toxins.

Fourth, we commonly have a major overload of toxins from food, water, and air, and from inside our body, from stress, deficient nutrition, an "inflammatory lifestyle," and imbalances in digestive and other systems.

Fifth, many environmental toxins are hard to remove with the best innate detoxification systems, and they remain stored in fat and bones for decades.

All this has produced a health crisis and a planetary crisis, which is currently enforced by the political clout of transnational corporations. They assert that they have a basic right and a fiduciary responsibility to their shareholders to maximize profits even if it means opposing regulation of pollution. They influence and corrupt governments by utilizing overwhelming financial resources. They insert covert items into international trade agreements that punish governments that regulate pollution, and in the process usurp national sovereignty. There doesn't appear to be a remedy to this situation any time soon, but this demands that people take effective global collective action if we are to ward off a global health catastrophe. This crisis also requires a transition to a more service-based economy with less purchase of manufactured "stuff" that creates pollution as a by-product. Refer to Believing Cassandra, by Alan Atkisson, 1999.

The connection between environmental chemicals and cancer is made clearly by Sandra Steingraber in Living Downstream 1998. Cancer incidence has risen rapidly, especially for rare and unusual types of cancer, and in children, with highest rates near industrial plants and toxic waste sites and in highly industrialized sections of the country. A majority of new chemicals are released without being tested for carcinogenicity. Four billion pounds of industrial chemicals are released onto to the planet every year. Genetically modified plants for food production have been poorly tested, and have been released in spite of studies showing harmful effects.

The regulatory agencies, the FDA, the EPA, and the USDA, have been negligent, and they continue to allow the release of more transgenic plants every year, with more pesticides, influenced by the giant biotech companies. The American Dental Association put a gag rule on dentists, not allowing them to inform their patients that mercury fillings in their teeth is harmful. Meanwhile many people's saliva has a greater level of mercury than what is allowed in lakes and rivers.

Toxic chemicals have been on the rise. Approximately two decades ago the average person had only 100 synthetic chemicals in their blood, but by 2004, the Environmental Working Group studied 287 chemicals in newborns' cord blood, and an average of 200 toxic chemicals were found in each newborn. Of the 287 compounds, 180 were found to cause cancer in animals or humans. This is reported in Dr. Crinnion's book. Winds blow chemicals all over the globe, and pristine arctic ice has toxic chemicals.

Safety testing has been poor. It usually checks single chemicals. Little or no testing is on how chemicals act synergistically, as in the toxic soup we encounter in daily life. A certain low level has been considered insignificant, but evidence now exists that extremely low levels can have definitely harmful effects, especially the endocrine disrupters. In the 1970's and 1980's, levels of BPA (in use since 1957) were undetectable in the environment with methods available then. By the early 21<sup>st</sup> century, improved technologies were able to detect these low levels, and a report in JAMA (Journal of the American Medical Association) Sept 17, 2008, 300:11, p.130, and in the journal Circulation showed elevated urinary levels of BPA in humans were associated with diabetes, heart disease, and childhood obesity. BPA accumulates in body fat and remains there for years. Dr. Crinnion's book makes the case from clearly demonstrated studies that toxins cause obesity, and reducing toxins can result in fat loss. BPA also interferes with the body's natural detoxification systems.

Dr. Bland's and Dr. Crinnion's books each has questionnaires for detecting whether current health problems are especially connected to an excessive build-up of toxins. Even if a person does not have overt symptoms, the importance of supporting good detoxification is essential. The major red flags alerting to potential toxic buildup are, in order of appearance, immune system disorders (allergy, asthma, and autoimmune conditions), nervous system symptoms, and endocrine disorders.

The first priority is to decrease exposure to toxins from the external environment, from the diet, from the home environment, and from internal production of toxins from imbalanced systems, especially the gut.

The next step is to strengthen the body's natural detoxification systems with certain foods and supplements. Then promote the elimination of toxins through the gut, skin, kidneys, and lungs.

Dr. Crinnion details choosing the best foods, either organic or ones that are not in the "dirty dozen." He has lists of fish that are less and more toxic. He also details household products, furniture, accessories, etc. that have low toxicity. Dr. Bland and Dr. Crinnion list foods and supplements that promote detoxification.

When people commonly talk about detox or cleansing, they often refer to purging or fasting. Many traditions and nearly all religions have some type of fasting recommended, and it may have many benefits besides detoxification. Eating a late breakfast or extending the time between meals can have some health benefits, but extended fasting is not suitable for every person. Fasting without adequate protein support and certain detox-promoting foods can actually cause ill effects from the toxins being released from the fat. A certain amount of protein and sulfur are needed for phase II detoxification.

With fat loss, the toxins in the fat are released into the blood, so that blood levels of toxins rise, and toxicity symptoms occur. The liver sends them through the bile and into the gut, but they get re-absorbed into the blood, around and around again. If the body could eliminate them easily, it would have done so decades ago. That is why they get stored away in the fat where they are less harmful. When a person loses weight without a good detox program, he or she often feels miserable and will feel better gaining back the fat to store the toxins away again.

A hundred years ago or more, it was a traditional method to use natural agents that caused vomiting and diarrhea (purging), and it was very effective in helping the person recover from illness. People then, by natural selection, had genetically stronger constitutions and could better handle these extreme detox methods. People with weaker constitutions had died of various causes and had not passed on their genes to the next generations. In modern times, the weaker human genetic stock has survived due to better sanitation, antibiotics, more availability of food, fewer injuries, fewer maternal deaths in childbirth, etc. Weaker constitutions now do not handle well the more intense cleansing methods like prolonged fasts, purging, etc.

The seven Day Detox Miracle, by Peter Bennet, N.D., and Stephen Barrie, N.D., describes a detox program that appears to be a modified fast but includes vegetables and rice protein. It is mainly "fasting" from problematic foods and substances, eating only very clean, low allergenic, high nutrient-dense foods.

So what is a good plan to support detoxification systems?

For cleaning up the home environment, Dr. Crinnion's book describes that in detail, as well as choosing cleaner foods. The Environmental Working Group (EWG) also has valuable information regarding this.

For strengthening detoxification systems, it is helpful to understand the process in the liver, the body's main detoxifier. The Textbook of Functional Medicine has very detailed explanations of this process.

Phase I transforms fat-soluble or fat-like molecules into water soluble forms, so that the next step, phase II, can follow by attaching other compounds to the toxin to render it less toxic and to ready it for excretion by the kidneys. Phase I has many genetic variants of this Cytochrome p450 system of mitochondrial enzymes, and certain foods and supplements can enhance the action of those enzymes that are weak.

In phase II, several different amino acids and other substances are attached to the molecule, such as glycine, taurine, cysteine, glutathione, glucuronic acid, and others, following different pathways. This also has many genetic variants. If phase I is faster than phase II, the intermediate metabolites can build up while waiting for phase II. These metabolites are sometimes more toxic than the original substance. Death from acetaminophen (Tylenol, etc.) overdose, fairly common these days, comes from toxicity of the intermediate metabolites not being cleared by phase II, not from the acetaminophen itself. Often people with Chronic Fatigue Syndrome and Fibromyalgia are "imbalanced detoxifiers," with phase I going faster than phase II.

One of the major areas of support for detoxification is providing extra nutrients to support both phases, and especially Phase II for imbalanced detoxifiers.

Some foods and supplements that support especially Phase I are whey protein, blackberries and blueberries, Vitamins A and C, grape seed extract, resveratrol, flavinoids, and quercetin. Vitamin C is manufactured by most animals in enormous amounts in response to toxin exposure, except for humans, apes, guinea pigs, and a few others.

Those that support Phase II are many: Cruciferous vegetables like cabbage, broccoli, collards, cauliflower, etc., garlic, onion, eggs, beets, n-acetyl cysteine (NAC), glycine, lecithin, limonene (from citrus peels), fish oils, dandelion, turmeric, globe artichoke leaf, ginkgo, Rooibos tea, cocoa, and licorice.

Green tea, milk thistle, watercress, and rosemary support both phase I and phase II.

Many fat-soluble toxins (called P.O.P.'s or persistent organic pollutants) like DDT, DDE, dioxins, PCB's, chlorinated pesticides, BPA, etc., cannot be transformed by CYP450 enzymes in Phase I, so they stay in the body in fat cells and in the blood for years and decades, being recycled through the gut, as mentioned previously. They can be expelled through the gut (Phase III, elimination) if their re-absorption into the blood is blocked. Chlorophyll, green tea, rice bran, cholestyramine, seaweed, and Olestra can do

this. Dr. Crinnion has had success with many patients using this method, reducing weight, reversing diabetes and metabolic syndrome, etc., and reducing blood levels of these fat-soluble toxins.

Toxic metals, such as cadmium, lead, and mercury can also build up and can be stored in bone and kidneys. Urine tests with provocation by a chelating substance, such as EDTA, DMSA, or DMPS can help to evaluate toxic load, and using these chelators and vitamin C can reduce the load, along with support for Phase I, II, and III.

Blood tests mentioned before are available by some labs, to check levels of P.O.P's, as well as solvents and organophosphate pesticides. Probably the most useful blood tests are the ones that check for the long-lasting pollutants, giving an indication of toxic load and need for special measures to support detoxification. These are the pollutants that may be partly driving the obesity and diabetes epidemic. Other short-acting toxins can be removed from the body simply by stopping the exposure and by providing nutritional support. Genomic tests can detect weaknesses in Phase I and Phase II and would indicate special support for these pathways.

For Phase III, elimination through the gut may include colonic irrigation, coffee enemas, consuming extra fiber, probiotics, green tea, and rice bran. For kidney excretion, drinking plenty water and alkalinizing the urine helps. An alkalinizing diet, green powders, mineral water, alkaline water, potassium citrate, and sodium bicarbonate all help to alkalinize the urine. Through the skin, sweating, saunas, and dry brushing help. Exercise, massage, and dry brushing all increase circulation of blood and lymph to allow elimination through all outlets.

What do we do with this information?

For someone who is healthy, has no symptoms, has no family history of cancer, does not live in an agricultural or industrial area, has had no known major toxic exposures, takes no prescription or non-prescription drugs, drinks no alcohol, and is not planning pregnancy, a prudent clean lifestyle would be recommended to avoid future toxic exposures: Eat organic, locally grown food as much as practical, filter drinking water, keep the home environment free of chemicals as possible, including personal care products, cleaning agents, and building materials. Keep physiologic systems in balance with healthful lifestyle to limit production of internal toxins. If these conditions do not apply, then more extensive actions are needed. Before getting pregnant, it may be advisable do some testing and special detoxification methods in preparation. For children with ADHD or Autistic Spectrum Disorder, testing and special methods are relevant. For urban, industrial, and agricultural areas, air purifiers are important. For problems with immune, nervous, or endocrine systems, a known major toxic exposure, multiple chemical sensitivities, or a personal or family history of cancer, an evaluation for toxic load is appropriate.

Toxic buildup often hits the immune system first: allergies, asthma, autoimmune conditions, frequent or severe infections, or cancer. Next neurological symptoms or

illnesses occur, and then the endocrine system gets imbalanced. Anyone with these systems disordered, especially in that order, would be strongly advised to have evaluation and testing. Anyone with multiple chemical sensitivities most certainly has a heavy load of toxins, a significant genetic defect in detoxification, or both. Also after doing Dr. Bland's questionnaire at the beginning of the chapter on detoxification, several "yes" answers trigger a need to do further evaluation.

What does an evaluation involve?

A genetic test for detoxification deficiencies would be a good start. Nutritional support can help to strengthen these weakened areas.

If current exposure is uncertain, blood or urine tests for the short-lived chemicals such as solvents, parabens, organophosphate pesticides, exhaust combustion products, etc. Many of these have hidden exposures in the home. Dr. Crinnion's book has an excellent survey of the sources of exposure to chemicals in the home, especially household products, building materials, and personal care products. If current exposure to high levels of chemicals is determined by these tests, then the sources need to be identified and eliminated.

Blood tests for the long half-life, fat-soluble pollutants would be helpful, because of their difficulty in exiting the body. These include dioxins, P.C.P.'s, chlorinated pesticides, and others. If buildup of these pollutants is present, then a concerted effort to aid in the removal of these toxins is needed, with the methods presented here previously.

Re-testing to see if the current exposure has stopped and to detect reduction in the blood levels of the long-term pollutants is recommended.

Testing for heavy metals such as lead, mercury, cadmium, aluminum, etc. can start with a hair analysis, and if appropriate, a urine test challenged with a chelator, requiring a prescription drug from a qualified health professional.

Long-term chelation of the heavy metals with a drug would only be appropriate if there was evidence of a large body burden of the metals that had a clear connection with health problems. There is some risk for adverse effects from any drug, including a chelator, to be taken long term. A lesser degree of body burden of heavy metals could be treated with food substances, botanical (herbal) medicines and other natural detoxifying methods.

In the toxic soup the average person encounters, to ignore the warnings and to do "business as usual," to wait until some debilitating autoimmune or neurological illness or cancer occurs would be foolish and a little late. Unfortunately that is the way the average person lives. If we want to stop these toxic processes before they cause insurmountable damage, we need to act now to have personally as clean a lifestyle as possible, to take special measures to clear out toxins when their buildup is in excess, and to collectively mobilize the political and financial will to clean up our home planet.