

Early Detection – Detoxification

According to the EPA, over seven billion pounds of 650 different industrial compounds are released into the environment each year, and, unavoidably, some ends up in our bodies – with adverse health consequences. There are a few simple tests you can utilize to determine the levels of some of the more common toxins in your body as well as provide an assessment as to how well your liver is performing its job of toxin removal.

Toxic Heavy Metals Analysis

Hundreds of enzymes in the body rely on essential minerals in order to work properly. It is possible for toxic heavy metals to attach to these enzymes instead of the proper minerals, making the enzymes useless. For example, if an enzyme is supposed to bind with magnesium, but instead becomes bound up to arsenic, that enzyme is unable to function properly.

Because of the increasing amounts of pollution present as part of modern-day life, many of us have accumulated significant amounts of toxic heavy metals, which interfere with proper enzyme function and promote processes associated with aging.

Hair mineral analysis is a simple, noninvasive and inexpensive way to measure the levels of toxic metals in the body. These toxins include aluminum, arsenic, lead, mercury and others. Hair testing provides a semi-quantitative method of assessing your exposure to these toxins, particularly over the previous few months. One gram of hair is taken from the nape of the neck and sent to the laboratory to be analyzed by a mass spectrophotometer. The specimen can be collected at Vitallife or you can do it yourself at home. If the results suggest significant accumulations of these toxins, detoxification strategies such as oral *chelation therapy* may be done order to safely remove these toxins from your body. In cases of more severe toxic heavy metal accumulations, intravenous chelation therapy may be needed.

- With hair mineral analysis, about a gram of hair is snipped from the nape of the neck where removal is not visible and the just emerged strands indicate recent exposure. This cost-effective procedure is a good first step, with more rigorous tests called for if significant abnormalities are discovered.
- With a urine provocation test, an agent designed to concentrate heavy metals in the urine is administered orally or intravenously and the urine is collected for analysis.

- Blood tests are useful in cases of substantial toxicity or poisoning but much less effective in determining low-grade chronic accumulations, so in most cases, we prefer hair or urine screening tests.

Fat-Soluble Toxins

Establishing levels of fat-soluble toxins in your body is more expensive and more difficult than testing for heavy metals, and tests have only been developed for a few hundred of the tens of thousands of chemicals that can accumulate in your fatty tissues. However, your liver is the most important organ in the body when it comes to detoxification and tests do exist to assess how good a job it is doing.

To eliminate fat-soluble toxins, the body must first convert them to less-toxic water-soluble metabolites. The liver helps in this process, using specialized enzymes to first convert fat-soluble toxins to water-soluble toxins (Phase I), and to then convert those into even safer water-soluble chemicals that can be removed in the urine and stool (Phase II).

To test the liver's detoxification capacity, a patient ingests caffeine, acetaminophen and aspirin. In Phase I the liver processes most of the caffeine, so testing the saliva a few hours later can determine Phase I capacity. Blood and urine analysis the next day can determine the liver's Phase II capacity as aspirin and acetaminophen must go through both steps to be eliminated.

Genomics detoxification testing is a more sophisticated assessment of the liver's Phase I detoxification capacity. It assesses genetic variations of the enzymes used by the liver in the detoxification process and can help determine such risks as cancer, addiction, and Parkinson's disease.

Environmental Pollutants Panels

Environmental pollutants panels are screening urine tests that measure the levels of several common environmental pollutants in the body. A typical panel used tests for benzene, parabens, phthalates, styrene, toluene and xylene. *Benzene* is an industrial solvent and is used in the manufacture of some plastics. It exerts toxic effects on the brain and bone marrow, and chronic exposure has been associated with anemia and leukemia. *Parabens* are commonly found in foods and cosmetics, skin creams, sunscreen lotions and shampoos, and are known endocrine disruptors, which interfere with hormone function. *Phthalates* are used to soften plastic products

and are also endocrine interrupters that can affect breast tissue in women and prostate tissue in men. *Styrene* is found in fast food ware such as styrofoam cups and bowls. Long term exposure to even small amounts of styrene can cause nervous system problems such as fatigue, nervousness and insomnia. It depresses the bone marrow and has been declared a possible carcinogen. *Toluene* is used in the manufacture of rubber products, oils, resins, adhesives, inks, detergents, dyes, and explosives. It is toxic to the nervous system and long-term low level exposure can result in headaches, fatigue, loss of appetite, disturbances in menstruation, reductions in I.Q. and psychomotor skills. *Xylene* is a solvent used in the manufacture of gasoline and polyester fibers. It is used to make dyes, paints, lacquers. Unlike other pollutants, xylene does not accumulate in the body, but chronic exposure has been associated with disturbances to the nervous system. Symptoms such as headaches, irritability, depression, insomnia, agitation, extreme tiredness, tremors, impaired concentration and memory have been linked to chronic xylene exposure. Specific detoxification strategies can be undertaken if accumulations of the above toxins and pollutants are found. Many of these toxins will come out in the sweat, so vigorous exercise and the use of saunas can help with toxin removal.

Hepatic Detoxification Profile

In addition to measuring the actual levels of toxins, it is useful to see how good a job your body is doing at eliminating these toxins. The liver has the greatest responsibility for toxin decontamination, and it possesses hundreds of specialized detoxification enzymes to assist with this task. This occurs in two steps referred to as Phase I and Phase II detoxification reactions. In Phase I the liver converts mostly fat-soluble toxins into water-soluble compounds that can be more easily excreted in the urine and stool. In Phase II, a water-soluble molecule is attached to the partially processed toxin, which makes it much less toxic and easier for the body to excrete.

The products of the Phase I reactions can still be quite toxic, so it is important that Phase I and Phase II reactions work in harmony or Phase I toxins can accumulate. The *Hepatic Detoxification Profile* is a urine test that shows how well these phases are working and also how well they are synchronized. A common problem is for Phase I to work too quickly and Phase II to be too slow. An easy remedy is to drink a small amount of grapefruit and pomegranate juice each day. Grapefruit juice contains a compound known as *naringinen*, which slows down Phase I, while pomegranate juice is rich in elagic acid, which speeds up Phase II.

Nutrition and Supplement Recommendations

Reducing your exposure to the myriad of pollutants in your world will go a long way toward protecting your health and extending your life. But diet and lifestyle changes can also strengthen your body's ability to remove accumulated toxins. Try the following:

- Make sure your diet includes lots of cruciferous vegetables (broccoli, cauliflower, kale, cabbage, Brussels sprouts, bok choy) for the detoxification properties of their many antioxidants.
- Eat lots of garlic, onions, lemon, rosemary, and green tea to help your liver eliminate heavy metals.
- The flavorful herb, cilantro, is a natural chelator of heavy-metals.
- Strengthen liver function with milk thistle (silymarin) and alpha lipoic acid.
- Vitamin C, magnesium, selenium and many of the B vitamins help optimize detoxification enzyme function.
- N-acetylcysteine (NAC) supplements help boost levels of glutathione, one of the liver's most important Phase II detoxifiers.
- Maintain a regular aerobic exercise routine and treat yourself to the occasional sauna; heavy metals and fat-soluble toxins may be partially excreted in sweat.