

Why Do I Need to Detox My Body?

The liver is one of the hardest working organs in our body. It not only plays a critical role in the breakdown of nutrients, but also in building up body tissues. It is the storage site for several essential vitamins and minerals such as iron, copper, B12, vitamins A, D, E, and K. Red blood cells are produced in the liver, and the immune cells in the liver helps fight off infections.

The liver is the organ in the body that breaks down poisons present in the blood, such as alcohol, and removes toxic compounds such as bio-toxins and heavy metals. The gallbladder then secretes it into the digestive tract with its bile, for removal from the body in the feces. Bile serves a number of functions, but helps to lubricate the digestive tract and acts as a medium to eliminate toxins from the liver. The liver and gallbladder have numerous other functions, including digestion, in the breakdown of fats.

Among its many functions, the most important role of the liver is that of detoxification. The liver detoxifies harmful substances by a complex series of chemical reactions. The role of these various enzyme activities in the liver is to convert fat soluble toxins into water soluble substances that can be excreted in the urine or the bile depending on the particular characteristics of the end product.

Every day our bodies are bombarded with toxins from both outside (exotoxins) – the polluted environment, medications, alcohol, cigarette smoke, car exhaust emissions and toxins from within the body (endotoxins) – the by-products of nutrient breakdown, hormones and bacterial waste products from the intestines. All produce harmful substances. It is the role of the liver to render these potentially harmful products into less harmful compounds.

The effect of exposure to toxins varies from individual to individual. Some people are highly sensitive to different endotoxins and exotoxins. Others, because their bodies are more resilient and their livers can detoxify more efficiently, are not so sensitive.

When optimum nutrition is provided the liver operates efficiently. A great many people however, do not eat the right kinds of foods to provide the liver with everything it needs for the elimination of the extra toxins our bodies are exposed to on a daily basis. If nutrition is compromised through poor dietary and lifestyle habits, this will have implications on detoxification processes, and other organ functions will suffer as the body retains the toxins it cannot eliminate.

The rate at which the liver can eliminate toxins can determine an individual's susceptibility to toxic overload, which in turn can lead to symptoms of ill-health. When the liver becomes so overloaded with harmful toxins that the enzymes that break them down can no longer cope, the toxins build up and this then manifests itself in a specific disease state which, without the intervention of correct nutrition, can become a vicious circle of chronic toxic overload. Many inflammatory conditions, such as arthritis,

cardiovascular problems, headaches, chronic fatigue and premature aging can all be related to a build-up of toxins that the liver is unable to cope with.

What does your liver do?

- Helps metabolize the fats, protein and carbohydrates from your diet.
- Balances blood sugar by releasing glycogen when blood sugar is low.
- Stores nutrients such as Vitamins A,D, E, K, B12 and the minerals iron and copper.
- Filters your blood removing harmful viruses, bacteria, yeasts, and foreign substances.
- Creates proteins needed for blood cells and the immune system.
- Breaks down and detoxifies excess and old hormones to maintain balance.
- Filters and breaks down unwanted compounds produced during metabolism.
- Detoxifies chemical toxins by converting them into substances that the body can eliminate in the bile and urine.
- Produces 1 quart of bile daily which enables you to digest fat, absorb the fat soluble vitamins and detox toxins. Without it, cholesterol levels rise and many digestive disorders can result.

Some of the signs that your liver may need support are:

- A slow digestive system
- Inability to digest fats
- Overweight
- Slow or sluggish metabolism
- Irritable bowel
- Abdominal bloating
- Food and chemical intolerance
- Feeling moody, depressed
- Foggy head
- Fatigue
- Frequent headaches

Studies show that if the detoxification pathways get compromised they can have an adverse impact on the several disorders in the body.

- Fatigue or loss of energy
- Autoimmune disorders
- Neurological disorders
- Hormonal imbalance
- Side effects to Drug reactions
- Chemical Sensitivities
- Allergies

Traditional Chinese medicine (TCM) and other traditional schools of medicine teach the importance of a healthy liver for overall wellness, but conventional medicine has yet to appreciate the ways in which detoxification can set the stage for true healing. In fact, conventional medicine usually treats illness by prescribing drugs, which increase the stress on the liver.

The subtle but important differences between one person's body and another's really show up when it comes to liver function. While one person's liver might be able to meet the detoxification demands of a highly polluted environment and a junk-food diet, another person's may be overwhelmed by ordinary everyday exposure to seemingly normal chemicals such as cleaning products. While one person may take a given medication and do just fine, another person may suffer intense side effects from the same drug. These differences can be traced back to the detoxification ability of each person's liver. Whether you find yourself at one end or the other of the detox spectrum, or somewhere in the middle, you can improve your liver's ability to detoxify by ensuring that it has all of the nutrients it needs to do its job.

How do we get so toxic?

- Air
- Water
- Pesticides
- Our Home
- Xenohormones
- Cosmetics, Shampoos, Lotions
- Phthalates
 - The phthalates push out gas from the plastic that leeches into our food and beverages.
 - These are now found in our river lakes oceans, and water supplies.
 - We eat so many plastics the government has established an average daily amount we digest.
 - Intake from everyday plastics on food is 210 mcg per day. Imagine that!!!!

How phthalates affect us:

- Disrupt our hormones in our body by sending wrong signals or blocking the receptor sites on our cells so the proper message cannot get through into the cell.
- They gum up our receptors hormones can't work
- Decrease energy and sex drive
- Affect brain chemistry which can lead to hyperactivity and learning disabilities.
- If they accumulate in organs can trigger cancers of breast, lung, prostate, and thyroid.

Styrene

- Styrene from styrofoam cups is a carcinogen is but there is no mechanism for the body to get rid of it.
- EPA studies of human fat biopsies show styrene residues in 100% of people
- An infant through breast milk can consume 18X more carcinogen dioxin in one year then the maximum "safe" lifetime dose.
- Childhood cancers at an all time high. Did you know that cancer is the #1 cause of death by disease in kids age 1-15.

IF you are planning to get pregnant it is recommended that you Detox before getting pregnant. This will allow many of the toxins to be eliminated so it does not affect your baby's health.

Where do we get all the toxins from?

Air

- Ohio is number 1 in the country for toxic emissions (USA Today).
- Dioxins- also found in foods created in part through manufacturing of plastics, pesticides, and other chemicals.
- Smokestacks release it in air, taken up by the clouds, then rains in to soil, taken up by plants that we use for human and animal feed.

Water

USA Today showed that the average city water contains over 500 different chemicals. Our water is poisoned by pesticide runoff, chemicals in the air, artificial fertilizers (which made from toxic sewage sludge) and man- made chemicals such as chlorine and fluoride.

Chlorine

A household item that is used to kill bugs and also as a home cleanser. Chlorine is a free radical initiator and elevates cholesterol and accelerates aging. Articles have

documented how chlorine in water will increase atherosclerosis and various types of cancer of the rectum and bladder.

Fluoride

- Is an enzyme inhibitor- this means it will cause certain enzymes not to work properly. This can affect our physiology and chemistry at a cellular level.
- Known to cause excessive calcification in arteries, joints, and ligaments. (i.e. hardening of the arteries)
- May contribute to cancer and osteoporosis
- 11 years study 1986-1997. 39,000 U.S. school kids no difference in tooth decay between kids drinking fluoridated and non fluoridated water.
- Instead of building strong bones the study showed fluoride damaged brain enzymes and lowered IQ's.
- Linked to behavioral disorders, flu-like symptoms and arthritis.
- Fluoride may also cause an increase in bone cancers and hip fractures by displacing minerals in the bone replacing it with fluoride.
- Death rates higher in fluoridated communities versus those living on well water.
- U.S.NCI study showed a 70% increase in osteosarcoma (bone cancer) among young men in fluoridated areas of Seattle and Iowa versus 4% lower incidence in young men in non-fluoridated areas in the same states.
- Prozac contains fluoride molecules.

Excess copper in water

- Copper from copper plumbing pipes can leech in to the acidic water. Copper then may build up in the tissues of the body. This can be determined by doing a hair analysis.
- Alkaline water machine is recommended. Using alkaline water may be a great benefit.

Pesticides

- A catch all term for herbicides fungicides and insecticides
- Found in lawns and gardens, school yards, parks and golf courses.
- In all commercial grown crops that are not organic.
- Roadside spraying and aerial spraying for mosquito's

Indoor Pesticides :Spraying monthly for insect and bug control in:

- Schools
- Businesses
- Restaurants
- Food factories
- Churches

- Home
- Flea collars and shampoos for pets

Research at Tufts University

- Breast cancer cells were growing in flasks. They did not add anything to the flasks and found out the flask contained non-phenol ethoxylates (NPES), which has an estrogenic effect.
- Plastic bottles water bottles, plastic baby food bottles, and all plastic food containers contain these non-phenol ethoxylates.

Xenohormones and Endocrine Disruptors

Xenohormones are substances (pollutants) originating outside the body that have hormone-like and estrogen-like activities. Exposure to these substances can have a profound impact on your natural hormonal balance.

Xenohormone exposure is especially high in today's industrialized countries and results from consumption of feed lot meats and dairy products (full of synthetic hormones), commercially grown fruits and vegetables (grown with pesticides, herbicides, and chemicals) petrochemical compounds (perfume, hair spray, room deodorizers, cooking with plastic, etc...) and prescription synthetic estrogens and progestins (such as the pill and estrogen replacement therapy). These exposures are responsible for reproductive abnormalities that are approaching epidemic proportions such as; cancers of the reproductive tract, infertility, and low sperm counts.

The potential consequences of these exposures are overwhelming, especially since we are passing these reproductive abnormalities on to our children.

Limiting your exposure to these pollutants as much as possible will substantially improve the quality of your health.

Xenobiotic Forms of Estrogen

A xenobiotic "hormone" is a chemical produced outside the body that has the same or similar effect as the hormone it mimics. They may also be referred to as "hormone disrupters". There are numerous forms of xenobiotic chemicals that are believed to mimic estrogen. These are called xenoestrogens.

- These xenohormones are like a virus on a computer
- Alter the sensitivity and number of receptors on the cell membrane jamming signal or scrambling messages.
- Disrupt the balance and interactions of the hormones.
- Affect neurotransmitters (which are brain messenger hormones).

Ingredients of Concern

- Phthalates — these industrial plasticizers are widely added to nail polish and fragrance. Recent studies link them to impaired reproductive development in baby boys exposed in the womb or through breast milk.
- Fragrance — "Fragrance" mixtures, exempt from product labeling laws, can comprise hundreds of individual ingredients, and are common human allergens. A recent survey found that up to one of every 50 people suffers immune system damage from fragrance exposures.

If you want to find out how safe the products are that you use, go to:

www.safe-cosmetics.org

In the past 60 years over 87,000 man-made chemicals have been introduced in to our food and water supply. Can you imagine the combined effect they may have on your body? What about prescription medications and their toxic effect on our liver and our body?

Toxins stockpile in your body!

- 100% of people studied, show dioxins, PCB's, dichlorobenzene, and xylene.
- Dioxins and PCBs are among the most potent causes of cancer.
- Babies in the mother's womb are now showing over 200 toxins. They are loaded with toxins before they are even born!!!

Elimination Organs

- Liver- primary elimination organ
- Kidneys – secondary through urine
- Bowels- constipation can hinder eliminating toxins
- Skin- 2 million sweat glands 18 Sq. feet 6 miles of skin ducts
- Lungs- removes gaseous poisons CO₂

Liver Detox and Purification System

- The liver is the primary filter in our body.
- It is one of our body's self- defense mechanism.
- It is responsible for neutralizing metabolic products, chemicals and toxins so they can be eliminated.
- When not working properly toxins build up in the body.
- This can affect mood, behavior, and overall health.
- Responsible for over 500 separate activities
- Breakdown and excretion
- The liver which is the detox system is over worked by drugs, toxins and chemicals that are found everywhere.
- These toxins can lead to overload on the detoxification pathways of the liver.
- This can lead to free radicals and cause harm to many of our body systems.

Liver Detoxification

Healthy detoxification is of utmost importance when managing chronically ill patient or patients with metabolic disorders such as diabetes. The management of diabetes, thyroid, adrenal and menopausal patterns will be not as effective if detoxification imbalances are not addressed. The rest of the health care industry is basically looking at lab values to see what hormones a person is deficient with, or even worse, recommending the same hormone therapies for everyone. Many times these hormonal imbalances exist due to a compromised detoxification function. This is especially the case if the patients profile does not match the patient's symptoms or if they have a previous history of toxic overload in the form of chemicals or drug exposure. If the patients have detoxification issues as the cause of their symptoms, the use of other hormones or drugs that employ these pathways has potential to exacerbate the metabolic patterns and make your symptoms worse.

If detoxification pathways are compromised, or are down regulated the potential for metabolic disorders exists. For example numerous studies have demonstrated the adverse impact of compromised detoxification on neurological disorders, chemical sensitivities, adverse drug reactions, fatigue, autoimmune disorders, Defects in optimal detoxification may cause hormones to be partially metabolized. If hormones are partially metabolized that may not be able to send the proper message into the cell. These non-active hormones can compete with active hormones and throw off the proper feedback pathways. The end result may be a patient that has symptoms of hormonal imbalance but their lab results do not correlate with their symptoms. Many factors influence liver detoxification, including physiological patterns and genetics.

There are two stages of liver detoxification: Phase I and Phase II. The goal of liver detoxification is to transform compounds that are fat soluble to water soluble. These include things such as hormones, neurotransmitters, bacteria, drugs, pesticides and environmental toxins.

PHASE I

Phase 1 uses many, many enzymes to break substances down. This phase is the 'SUBTRACTION' phase of metabolism, where the enzymes work to subtract molecules from substances and break them up into smaller more useful units, just like the process of food digestion does so in the gut. Phase 1 is utterly dependent on these ENZYMES, whose speed of metabolism is in turn affected by things like genetics, exercise and the presence or absence of certain substances/supplements in the diet that can either speed them up (induce them) or slow them down (inhibit them). After the enzymes have broken down some of the substances, some very toxic end products (metabolites) remain and they must quickly be shunted to phase 2 pathways in order to make them safer for the body to use. Heavy metals in particular can make these enzymes dysfunctional.

The Phase I activity is carried out by the cytochrome P 450 enzyme system and consists of oxidation and reduction reactions. Phase I enzymes directly neutralize some chemicals but most are converted to intermediate metabolites that are then processed by the phase II pathway. Various nutrients are required in order for the Phase I detoxification system to be carried out efficiently. Cytochrome P450 reactions generate free radicals and this can cause secondary damage to cells. An adequate supply of key antioxidants and free radical quenchers is therefore essential to prevent tissue damage. Reduced glutathione, superoxide dismutase and additional nutrients such as beta carotene, vitamin E, selenium and N-acetyl cysteine will act as antioxidants.

Other nutrient cofactors required for cytochrome P450 reactions include riboflavin, niacin, magnesium, iron and certain phytonutrients such as indoles from cruciferous vegetables and quercetin have been shown to support Phase I detoxification.

The metabolites from this detoxification process are often potentially more harmful than their original toxic compounds and it is important for health that they are not allowed to build up. Therefore it is important that the phase II pathway is working properly.

Phase II

Phase II - this typically involves the binding or joining together the Phase I intermediates, however some toxins may be directly acted upon by the Phase II enzymes. This binding or conjugation reaction either neutralizes the toxin or makes the toxin more easily excreted through the urine sweat or feces. There are six main Phase II pathways:

- Glutathione conjugation
- Glycine conjugation
- Methylation,
- Sulfation
- Acetylation
- Glucuronidation

In order to understand Phase II detoxification a brief description of these individual phase II processes, the types of toxins they are used to eliminate, and the nutrients required for them to be carried out properly:

Glutathione Pathway

In Phase II glutathione conjugation is the primary pathway for these intermediate metabolites. Glutathione is made up of three amino acids, glycine, cysteine and glutamic acid. In order for the body to make glutathione it is dependent on magnesium and potassium (along with B6, folic acid, riboflavin, choline, methionine, cysteine, vitamin C, betaine, glycine, copper, zinc, and selenium). A lot of patients who are on diuretics for blood pressure may be deficient in magnesium and potassium and this will affect the body in producing glutathione. Numerous studies have shown that taking these essential nutrients will enhance glutathione levels. Glutathione is the main reducing agent in Phase II conjugation. As a Phase II detoxifier glutathione binds with the Phase I chemicals to produce water soluble substances that are excreted in the urine. Glutathione is available only through two routes: diet and synthesis (your body making it).

Increased exposure to toxins as well as a poor dietary supply of glutathione can soon lead to glutathione depletion and increased damage from these highly reactive intermediates. Glutathione is found in a variety of foods that include fresh fruits, vegetables, fish and meats. There are numerous defects that cause the glutathione binding process to not work properly. These include lack of essential nutrients to make glutathione and toxic loads of diseases (to many toxins in your body) that deplete glutathione faster than it can be produced. For example smoking depletes glutathione levels. It does this because of free radicals it produces as well as the oxidative stress that glutathione must quench as a result of smoking. Glutathione levels may also be depleted in conditions in which the body is placed in oxidative stress such as infections, cancer, gastrointestinal or pulmonary inflammatory disorders, etc.

Methylation Pathway

Methylation involves binding with methyl groups from the Phase I end products. Methylation helps to detoxify many of the steroid hormones, including estrogen. The methylation pathway begins with the amino acid methionine, and needs betaine, ascorbic acid, alpha tocopherol, choline, pyridoxal-5-phosphate, trimethylglycine, magnesium, methylcobalamin and folic acid to function properly. Methylation eventually yields usable sulfate with the help of the trace mineral molybdenum.

Sulfation Pathway

The Sulfation pathway needs sulfur containing compounds so they can bind with the Phase I end products. It is the Phase II pathway for breaking down neurotransmitters (dopamine, serotonin, etc.) steroid and protein based hormones. Sulfur amino acid metabolism and its co-factors such as methyl donors, B6 and magnesium are important for optimal function. Diets low in methionine and cysteine have been shown to decrease sulfate conjugation. Explained simply, if you do not get enough of these co-factors or nutrients in your diet this pathway will not work as efficiently and can cause hormonal imbalance. Sulfur containing foods include eggs, cheese, meat poultry, nuts, and legumes. In some individuals they may be sensitive to sulfite containing foods (garlic), drugs, or food additives (dried fruit and preservatives). They may also have an abnormally strong urine odor after eating asparagus. Molybdenum is an important nutrient for sulfation.

Acetylation Pathway

Acetylation is a phase II liver detoxification pathway that attaches acetyl co-A to toxins to make them far less harmful and easy to excrete. This process requires thiamin, pantothenic acid, and vitamin C to function properly.

Glucuronidation Pathway

This pathway requires glucuronic acid to be able to bind to the toxins from the Phase I end products. This pathway is supported by B- vitamins; magnesium and glycine which helps the body make glucuronic acid.

Glucuronidation pathways in Phase II can be reversed by Beta glucuronidase enzymes produced by pathological bacteria and cause toxins to be reabsorbed increasing toxicity. Studies have shown that calcium d-glucurate, a natural ingredient found in certain vegetables and fruits can inhibit beta glucuronidase activity resulting in increased elimination of toxins.

In some people the detoxification pathways (Phases I and II) are out of balance. For example, if Phase I is more active than Phase II, a build-up of reactive intermediate metabolites can occur which in turn can lead to tissue damage and disease. These people are referred to as Pathological Detoxifiers.

Pathological detoxifiers can be identified as those individuals who are highly sensitive to fumes e.g. paints and perfumes, react adversely to various pharmaceutical drugs and may have a reaction to drinking caffeine.

Bile Excretion

- Once the liver has detoxified these chemicals they are delivered to bile for secretion into the intestines to be excreted.
- If not enough bile is being made we must improve its function.
- Gall Bladder problems such as difficulty digesting fats, flatulence, inability to tolerate fried foods, burping after meals. Unable to tolerate fish oils.

There is now an extensive body of evidence indicating that diet plays a crucial role in modifying the body's detoxification pathways. Even in allopathic medicine grapefruit juice is utilized for transplant patients as grapefruit contains naringenin which slows down Phase I enzyme activity. This enables such drugs as cyclosporine – which is given to prevent organ rejection – to stay in the system for longer prior to the drug being detoxified. Pathological detoxifiers may also find it useful to include grapefruit juice in their diet.

Vitamins and minerals – particularly the B vitamins – play a major role, acting as cofactors for many enzyme systems including those of liver detoxification, therefore ensuring a plentiful supply of the B complex group of vitamins is of prime importance for optimum detoxification. Therefore, including a diet which contain B vitamins as well as taking a good B complex supplement will aid the liver in this crucial role.

Depletion of vitamin C may also impair the detoxification process; vitamin C also prevents free radical formation. Vitamin C is found in citrus fruits and green leafy vegetables. However, in order to obtain optimum amounts supplementation may be required.

Vitamin E and selenium are cofactors for glutathione peroxidase activity as well as being powerful antioxidants. (Vitamin E also works synergistically with vitamin C.) Today, our diets are very low in selenium due to the depletion of the soil of this vital mineral. Supplementation is therefore imperative.

Cruciferous vegetables such as broccoli, cauliflower, brussel sprouts and cabbage in the diet have been shown to enhance Phase I activities. It is thought that the indoles which are the active ingredients in these foods are the major contributors to this activity.

Zinc is another essential nutrient and acts as a cofactor for many enzyme systems. Zinc deficiency can cause a whole range of consequences. One important role that zinc plays is in the functioning of an enzyme alcohol dehydrogenase involved in the conversion of alcohols to aldehydes in Phase I detoxification. Therefore anyone who drinks alcohol should ensure they have optimum amounts of zinc in their diet.

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These statements have not been evaluated by the Food and Drug Administration.
These products are not intended to diagnose cure or prevent disease.

In Summary

- The goal or job of Phase I pathway is to prepare or breakdown these products into smaller subunits for Phase II pathway.
- The CYP450 enzymes neutralize or breakdown metabolites to an intermediate compound.
- These compounds are then processed by the Phase II pathway.
- The end result of Phase I is to neutralize the compound or break it down for Phase II processing.
- It is important to know that the compounds broken down for Phase II is more active and more toxic
- So if Phase I is too fast and Phase II cannot keep up they can have severe reactions to this toxin overload and suffer from chronic illnesses.



Phase II Pathway

- Phase II pathway has to breakdown or bond with the intermediates from Phase I to make them more easily to excrete through the kidneys via the urine.
- In Phase II the intermediate chemicals get bound to certain amino acids and peptides. (Glutathione)
- Upon binding it carries them in to the gut so they can be excreted.
- Remember: for every molecule of chemical that is detoxified, we use up, deplete or lose forever a molecule of glutathione, plus a molecule of ATP or energy.

Gall Bladder

- If Gall Bladder is removed the cystic duct acts as a reservoir for the bile.
- Synthesis and elimination of bile is necessary for optimal removal of toxins and hormones.
- Bile Min or Cholacol II is recommended if your Gall Bladder has been removed. This is something that you should take for the rest of your life.

What can I do?

- Detoxify your body by doing a well balanced detoxification and purification program.
- Schedule a Detoxification Phone Consultation by clicking here: livingproof.cliniko.com/bookings or by calling our office.