

The Pathways of Detoxification

“One of the basic tenets of naturopathic medicine is that many diseases can be treated by enhancing liver function” - 7-Day Detox Miracle

The pathways for detoxing one's body include all the organs of the digestive system:

- Liver / Gallbladder
- Pancreas
- Lymph system
- Small intestine
- Large intestine

The **liver** performs approximately 500 distinct functions, more than any other organ in the body. Some of its main duties include:

- 1) **Carbohydrate metabolism** - Stores sugars converts different types of sugars into glucose, and maintains blood sugar levels.
- 2) **Fat Metabolism** - Produces bile, which makes dietary fats digestible, manufactures triglycerides, lipoproteins, and cholesterol. It also converts carbohydrates and proteins into useable energy forms.
- 3) **Storage of nutrients** - Stores vitamins A, D, B12 and the mineral Iron.
- 4) **Immune defense center** - Filters the blood, removing harmful bacteria, viruses, toxins, yeast, and other foreign substances.
- 5) **Conversion of hormones, metabolic waste products, toxins, and other destructive substances** - Dismantles and alters the molecular structure of unwanted and unhealthy materials so that they can be eliminated.

For vibrant health it's essential that liver pathways of detoxification are clear to conjugate hormones. **Hormone overload** looks like PMS, hot flashes, and all around crazy behavior. This overload is where estrogen and prostate-related cancers begin.

Hormones must be disassembled and reconstructed to prepare them to be recycled or eliminated. This happens with thousands of different enzymes, each with a different role.

Phase 1 - The enzymes act as 'soap' that liberates grease into little droplets. EFAs are essential for this process. Some toxins, like black

coffee are ready to be released, but others require a second enzyme 'soaping.'

Phase 2 - These intermediate compounds are routed along one of six chemically driven detoxification pathways, where they are further broken down and bound to specific types of protein molecules that guide them out of the body via the kidneys or bile. This process is called **conjugation**. There are six specific pathways. Three warrant special mention.

1) The glutathione conjugation pathway activity accounts for up to 60% of the toxins excreted in the bile. It also circulates through the bloodstream combating free radicals. No other conjugating substance is as versatile as glutathione, and the body's supply of it, most of which is produced in the liver, is easily depleted. Chronic disease, cirrhosis, excessive exercise, (which increases oxidative stress), and alcohol consumption blocks glutathione production. Cultured Vegetables and green drinks replenish Glutathione stores.

2) Sulfation pathway is the weakest pathway from a dietary perspective. Sulfation is responsible for the transformation of neurotransmitters, steroid hormones, drugs, industrial chemicals, phenolics, and toxins from intestinal bacteria. Too little sulfur, a molecule that must come from our diets, is a cause of ineffective detoxification. Alzheimer's, Parkinson's, and motor neuron disease have a strong association between the function of the sulfation pathway. High quality protein and Whey cultured daikon radish are two nourishing examples of replenishing the sulfation pathway.

3) Glycine, taurine, glutamine, arginine, and ornithine are the five amino acids that form the third detoxification pathway. Glycine is the most important for the neutralization of toxins. Benzoates, found in soft drinks, bind with glycine and rob the body's store of it. Aspirin competes for available glycine in the liver, which slows down this detoxification pathway. Glycine is not considered an essential amino acid because the body can make it, however it depends on an adequate intake of dietary protein. Organic eggs, meat, fish, whey, raw cheese, legumes, properly prepared grain, and grass fed gelatin are superb examples of high quality proteins.

It's important to follow the recommended diet protocol while cleansing so that these pathways remain unblocked by chemically treated foods and by pharmaceutical drugs, NASIAD, (non steroidal anti-inflammatory drugs) pesticides, and hormones.

If the idea of going 'cold turkey' from your morning cup-a-joe is a deal breaker, by all means have a shot of espresso. Coffee is detoxified in the

first phase of the liver. One shot will alleviate the headache and perceived tension of missing your coffee.

However, sugar--high fructose corn syrup--and alcohol can't be tolerated in any cleanse. The interference in the detoxification pathways are too great.

And FYI: A daily intake of **refined sugars** makes the liver expand like a balloon. When the liver is filled to its maximum capacity, the excess glycogen is returned to the blood in the form of fatty acids. These are taken to every part of the body and stored in the most inactive areas: the belly, the buttocks, the breast, and the thighs.