



ALIVE!

DETOX

IT IS ESTIMATED THAT the average American woman is exposed to some 200 chemicals before she even leaves her home in the morning. While men do not use the lotions and potions that women do, they are still exposed to potentially thousands of other chemicals in our environment, as are unborn babies, infants, and children. The food we eat, water we drink, and air we breathe are all contaminated to some degree or other. Consider the sad reality that the Environmental Protection Agency (EPA) estimates that 4.7 billion pounds of toxic chemicals were released into the environment in the United States alone in 2002.¹ In this day and age, exposure to toxic chemicals cannot be avoided.

Xenobiotics is the term used for substances that are foreign to biological systems. They come from solvents, cleaning chemicals, pesticides, herbicides, propellants, plastics, detergents, pharmaceuticals, building material, transportation, and industrial pollutants, just to name a few. Overexposure to heavy metals is another source of toxic contamination. These substances are from without, and are therefore, exogenous toxins. There are also endogenous toxins, which are produced within the human body. In some cases these are more toxic than what we are exposed to in the environment. Even elements of food and drink, such as alcohol and caffeine, must be dealt with by the human body. How does the body deal with the assault? Detoxification.

Detoxification is a marvelous and complex process that science is still unraveling. It occurs primarily in the liver and secondarily in the intestinal mucosal wall, though it does occur throughout the body. Different methods are utilized depending on the toxin. One common method is to transform the xenobiotic, from a fat-soluble molecule to a water-soluble one that can be excreted in the urine. The body also seeks to inactivate toxins, making them less harmful.

Detoxification is often a series of interdependent steps reliant on the next step to achieve the desired results. For example, a very important detoxification pathway involves a phase I reaction that up-regulates enzyme activity to transform the unwanted toxin. In some cases, this first step results in producing nasty molecules that are much more potent than the molecules they came from. Phase II reaction follows after, saving the day, by joining the nasty molecule to another substance, inactivating it. If phase II is inhibited, or if phase I is increased without a simultaneous increase in phase II, this results in more harm than good.

Detoxification takes place within us 24/7. With the consistent barrage of exogenous and endogenous toxins, we can be thankful for this. Detoxification is a way of life that our daily lives either support or work against. Living the detoxification lifestyle begins with doing our best to avoid exposure to known sources of toxicity. "Chemical dependencies, smoking, excessive alcohol, unnecessary prescription drugs, toxic work environments, homes with leaded paint, severe air pollution, polluted drinking water, and standard North American diets—

particularly sugary drinks, junk foods, processed meats, fast foods, and deep fried foods—should be avoided.”² Avoiding herbicide and pesticide use and residue, choosing natural cleaning products, and wearing an appropriate breathing mask when exposed to fumes are other suggestions.

Various enzymes, antioxidants, and nutrients are needed to facilitate detoxification. Phytochemicals are naturally occurring plant chemicals that have been found to protect the body in numerous ways. One way is the role they play in xenobiotic detoxification, minimizing their potential carcinogenic activity.

Detoxification is dependent upon adequate amounts of protein.

The phytochemicals found in onions, garlic, cruciferous vegetables, chlorophyll, citrus, and grape seed “act in a complex highly beneficial manner to improve balanced detoxification capability.”³ Research has found that garden cress enhances detoxification by increasing phase II activity. Cruciferous vegetables upregulate phase II enzyme activity as well, thus preventing the imbalance previously mentioned. Protective antioxidants, also found in plant foods, play a highly supportive role in liver detoxification. Antioxidants are extremely important in dealing with the nasty intermediate compounds that are produced by phase I. Other plant constituents, such as carotenoids, flavonoids, minerals, B vitamins, and vitamins C and E, are other powerful detox players.

Detoxification is dependent upon adequate amounts of protein. Amino acids are needed in phase II of detoxification. Glutathione, a protein composed of three amino acids, powerfully neutralizes free radicals and combats many environmental carcinogens and toxic substances. Selenium deficiency drastically diminishes glutathione activity. Lipoic acid supplementation (R-form) has been found to markedly enhance glutathione. Glutathione concentrations decline with poor protein intake as well as during inflammation and disease. Low glutathione levels leave the liver vulnerable.

Dietary fiber enhances both phase I and phase II. It aids in the removal of toxins by decreasing stool transit time and serves as an exit vehicle. The balance of microbes in the gut has been found to factor into how well the body detoxifies. Supplementation with probiotics has proven to be beneficial

in some situations. Exercise stimulates detoxification systems and actually increases antioxidant enzymes. Sweating aids liver detoxification and provides a valuable route of elimination for both organic and metallic toxicants. Sauna therapy aids in the removal of fat-stored toxins.

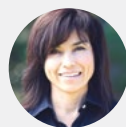
I have at times heard of individuals going on “a cleanse” for the purpose of aiding the body in detoxifying itself. The common recourse is fasting. While a day or two of fasting can be quite beneficial and has been found to stimulate important detoxifying enzymes, prolonged fasting can deplete glutathione stores and result in an imbalance between phase I and phase II activity. More preferable would be following a short fast with caloric restriction for a period of time while consuming copious amounts of organic green leafy vegetables, cruciferous vegetables, adequate protein, and providing the other necessary nutrients mentioned to support the detoxification process.

We live in a polluted world in more ways than one. Sin has resulted in spiritual toxins that arise from within and without. We stand in need of a lifestyle equipped with the resources God has provided to be able to live as Jesus did, in contact with a contaminated world without becoming toxic. A knowledge of the Savior, the presence of the Holy Spirit, holding fast the word of life, prayer, faith, confession, forgiveness, hope, love, joy, fellowship, are all-powerful detoxifying agents when experienced within (2 Peter 2:20, Philippians 2:15). These resources lead us to the One who, though pure, took our pollution, bore its devastation, and we are detoxed.

1. DeAnn Liska, PhD, Michael Lyon, MD, David Jones, MD, “Detoxification and Biotransformational Imbalances,” *Textbook of Functional Medicine, The Institute for Functional Medicine*, 2010, p. 275.

2. Michael Lyon, MD, Jeffrey Bland, PhD, David Jones, MD, “Clinical Approaches to detoxification and Biotransformation,” *Textbook of Functional Medicine, The Institute for Functional Medicine*, 2010, p. 552.

3. *Ibid.*, p. 549.



RISË RAFFERTY, RDN

Risë is a registered dietitian nutritionist. Her understanding of how significantly diet and lifestyle impact one's health and happiness fuels her passion to help, educate, and inspire others.