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Health Options

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Tuesday June 19, 2012

Sufficient nutrient intake equips body to fight toxins

Although we would like to think that our world should be completely safe, it never has been and likely never will be.

Life is a toxic affair. The natural environment is full of toxic substances. We are constantly exposed to both natural and man-made toxins in our foods and from environmental exposure. Fortunately, a healthy human body is equipped to handle most toxins in the amounts that are commonly encountered. As long as the supply of toxins does not exceed the capacity or our body's detoxification mechanisms, all is well.

QUESTION: What makes a natural or man-made substance toxic to the body?

ANSWER: Toxins have many different ways they affect the body. There is no single mechanism. Toxicologists will tell you, "It's the dose that makes the poison." Essential nutrients, required by the body, can be toxic at excessive doses. Even oxygen, clearly essential for life, can damage the body if its protective mechanisms are compromised.

Q: How does the body handle toxic substances?

A: All cells in the body have some detoxification capacity. For most toxins, however, the cells of the intestinal lining and the liver are the key detox centers in the body. You can think of the cells in the intestinal wall as being the first barrier to toxins, both physically and chemically. The next major detox site is in the liver, which is a complex chemical factory capable of carrying out thousands of chemical reactions. Typically, when toxic compounds (including many drugs, pesticides and natural toxins) are encountered by these cells, the substances are chemically altered in ways that reduce their toxicity and allow them to be eliminated in the urine.

Optimal function of this complex chemistry is dependent on an adequate supply of all essential nutrients. Perhaps the most important nutrient for this detox function is iron. Much of the complex detox chemistry taking place in the intestine and liver depends on the function of a large group of enzymes referred to by a rather nerdy-cool name, the cytochrome P450 superfamily. These enzymes are based on an iron-containing component called heme (also found in the hemoglobin in red blood cells and in red meat). Consequently, an adequate supply of iron is needed to maintain the optimal function of this detox system.

Q: How does iron deficiency affect the body's detoxification capacity?

A: Animal research indicates low iron intake can quickly reduce the levels of intestinal cytochrome P450. This reduces the capacity of intestinal cells to do their detoxification job and puts a greater load on the liver and other cells in the body. As iron deficiency progresses, the cells lining the small intestine can lose their structural integrity. When this happens, both the protective physical and chemical barriers are greatly compromised.

We focused here on iron because it is considered to be the most common nutrient deficiency in the world. However, a deficient intake of many other vitamins and minerals also can compromise aspects of our protective detoxification systems. It takes only one nutrient deficiency to trigger a domino effect that ultimately can cause myriad health problems.

Overall, eating a wide variety of foods increases the odds of meeting all nutrient needs and decreases the odds of getting too much of any single toxin.

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