

Natural Heavy Metal Detoxification: A daily strategy for all patients

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In modern society we are constantly exposed to heavy metals such as cadmium, lead and mercury. These heavy metals have no essential biochemical roles in our body, and conversely can cause us a great deal of harm if they build up to toxic levels. These heavy metals bind to our tissues, create damaging free radicals (oxidative stress), disrupt our endocrine (hormonal system) and interfere with the absorption and function of important minerals such as magnesium and zinc.

Cadmium is classified as a possible carcinogen. Lead can damage the nervous system and be particularly harmful to the developing brains of young children. Mercury is also known to damage the brain and nervous system and there is an increasing number of people being affected by its bioaccumulation in the food chain, especially in regard to fish and seafood consumption. (1)

As a result, the FDA and EPA have developed guidelines about eating fish and seafood to help reduce the risk of serious mercury accumulation and nervous system damage in our bodies. (2, 3) Nevertheless, all of us ingest a certain amount of mercury and other heavy metals such as cadmium and lead on a regular basis, to some extent. (1)

In addition to mercury bioaccumulation in fish, we are exposed to toxic metals from many sources, some of which include:

- activities and legacies of mining and toxic waste
- lead in paint and gasoline
- ongoing emissions from industrial and electricity-generating (particularly coal-burning) activities
- chemicals in everyday products
- novel technologies such as nanomaterials containing toxic elements like cadmium.
- lead ingested from old drinking water supply pipes. (1)

The good news is that, in addition to working to reduce our exposure and intake of these toxic metals, there are some natural things we can do to help remove or detoxify and eliminate some of the heavy metals already in our body and block the absorption of some heavy metals in our intestinal tract.

So what natural things can we do to help detoxify these heavy metals and/or block their absorption to some degree?

Certain foods that are high in sulfur have been shown to be useful, as heavy metals have an affinity to bind sulfur. Sulfur also makes this heavy metal complex more soluble enabling the body to more easily eliminate heavy metals in the urine or via the fecal route. Good sources of sulfur-containing foods are garlic and onions (and the allium vegetables as they are known) and also the brassicae family of vegetables, including broccoli, Brussels sprouts, cabbage, cauliflower, bok choy and turnips. These are also known as cruciferous vegetable. These vegetables contain sulfur-containing sulfurophanes as well as indole-3 carbinol, both of which also possess impressive anti-cancer properties, in addition to being good detoxifiers of toxic metals.

Garlic has prevented cadmium-induced kidney damage and decreased free radical damage due to lead in rat experiments.

Fiber ingested from whole grains and fruits has been able to reduce levels of mercury in the brain and in blood. The use of psyllium husk fiber (the active ingredient in Metamucil) has been shown to block the re-absorption of heavy metals back into the body once secreted into the gut via the liver and gallbladder following a meal (enterohepatic circulation).

The ingestion of healthy minerals such as calcium, selenium and iron, at optimal nutritional levels has been shown to block the absorption of heavy metals into the body. Selenium supplementation was also shown to increase mercury excretion from the body and reduce mercury-induced free radical damage in a study of 103 mercury-exposed villagers. Calcium is known to help block the absorption of cadmium and has reduced lead mobilization from the bones of women during their pregnancy and period of lactation. In children, nutritional iron has blunted lead accumulation.

In addition certain dietary supplements can also be helpful as heavy metal detoxifiers. It is well documented that the mini-protein known as glutathione helps to remove heavy metals from body tissues and excrete them from the body. (1) Our bodies naturally make glutathione from the ingestion of three amino acids found in food (glutamic acid, cysteine and glycine). The problem is that much of our glutathione gets used up by acting as an antioxidant in our cells and as a conjugating agent for various substances (including acetaminophen) in the detoxification of a variety of agents. This often leaves an insufficient amount of glutathione available to maximize its heavy metal detoxifying function.

However, studies suggest that we can optimize our glutathione status by taking a supplement that boosts glutathione synthesis. These ingredients include alpha-lipoic acid, N-acetyl cysteine, L-glutamine and milk thistle, which contains a glutathione-raising flavonoid known as silymarin. Taking glutathione in its preformed state has not been shown to be useful as it is poorly absorbed from the gut. But supplementing with these glutathione-boosting agents appears to be a good way to help optimize glutathione status, and thus heavy metal detoxification. In fact, alpha-lipoic acid has its own heavy metal detoxifying properties, over and above its role in raising glutathione. N-acetyl cysteine also has its own unique heavy metal detoxifying properties. So, it may be wise to take these glutathione precursors in a combination daily supplement formulation as a means to boost heavy metal detoxification. (1, 4)

There are other sulfur-containing amino acids that can also be helpful, which include taurine and methionine. Your body normally has ample methionine if you eat standard protein foods and ingest sufficient amounts of the B-vitamins folic acid and vitamin B12. Taurine is the most abundant amino acid in the heart muscle and it may play a key role in helping to prevent congestive heart failure, as it serves a multi-purpose function in the heart muscle. Researchers are still looking into its role in heart health, but it certainly has some detoxification ability regarding heavy metals. (1, 5)

For individuals with serious heavy metal toxicities doctors can administer intravenous pharmaceutical chelating agents, such as DMSA (dimercaptosuccinic acid), DMPS (dimercaptopropane sulfonate), EDTA (ethylenediaminetetraacetic acid: Edetic acid), Penicillamine, which are used to remove specific heavy metals from body tissues, and in some cases are used for the removal of excessive copper (Wilson's disease) and other nutritional

metals. But this is not something that is typically done as a standard preventive measure on the everyday patient seen in clinical practice. (1)

Detoxification Strategy

So, what does a heavy metal prevention and detoxification strategy look like for most patients? Well, first and foremost individuals should do their best to reduce exposure to heavy metals in the environment and the food you eat. With regard to fish and mercury consumption the FDA and EPA have made the following recommendations for pregnant and nursing women and young children, but we should all pay heed to this advice in my view:

- Avoid eating shark, swordfish, king mackerel, and tilefish (also known as golden bass or golden snapper)
- Limit consumption of all other types of fish to 12 ounces per week.
- Limit the consumption of canned albacore ("white") tuna or fresh tuna to no more than 6 ounces per week.
- Limit the fish eaten by young children to even smaller portions per week.
- Check local advisories about the safety of fish caught in local lakes, rivers, and coastal areas. If no advice is available, eat no more than 6 ounces per week of locally caught fish, and do not consume any other fish during that week.
- If more than the recommended amount of fish is eaten in one week, eat less in the following weeks. (2, 3)

Additional information about mercury can be found in references 6 and 7 below. I have also included a list of the safe and less safe fish to consume, regarding mercury levels, at the end of this article as a quick reference.

With respect to detoxification of heavy metals, the available research suggests that regular consumption of whole grains and fruits, and at least 3-5 servings per week of a cruciferous vegetable would help to remove some toxic metals from the body on an ongoing basis. Adding garlic and onions to foods being prepared also seems prudent, as well as the possible use of a fiber supplement containing psyllium husk fiber. (1)

As for supplements, individuals may benefit from the use of a high potency multiple vitamin and mineral supplement preparation that is enriched with the antioxidants vitamin C, vitamin E and selenium, which help to preserve and/or raise glutathione levels. With respect to calcium, consider using a multiple vitamin or an additional calcium supplement plus the food you eat each day. Individuals should aim for at least 1000 mg of calcium per day, and in many cases more optimally between 1200 and 1500 mg per day. Regarding selenium, a good multiple vitamin should contain 100-200 mcg of selenium, which is plenty. A multiple vitamin can also help ensure more ideal intake of folic acid and vitamin B12 to help optimize methionine synthesis. There is some preliminary evidence that a probiotic supplement may also be helpful in the heavy metal detoxification process.

Patients may also be advised to take a supplement each day containing glutathione boosters and detoxifiers, including alpha-lipoic acid, N-acetylcysteine, L-glutamate and Milk thistle – standardized to 80% silymarin content. (1,4)

Finally, sweating with exercise or by using a sauna may be a benefit as well, as toxic metals are also excreted in sweat. So, regular exercise is also a natural detoxifier, along with providing a multitude of other health benefits - another reason to keep doing aerobic exercise. (1)

Fish and Mercury Risk

Fish High In Mercury to Avoid:

- Shark
- Swordfish
- King Mackerel
- Tilefish (a.k.a. golden bass, golden snapper)

Lower in mercury but still to be avoided:

- Tuna steak (also used in sushi and sashimi)
- Canned Albacore white tuna

Fish to be eaten in limited quantities by women who are/may be pregnant or nursing, and young children:

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|--------------------------|-------------------|------------------------|
| • Canned light tuna | • Haddock | • Gulf Coast blue crab |
| • Sea bass | • Mahi-mahi | • Pike |
| • Gulf Coast oysters | • Largemouth bass | • Great Lakes salmon |
| • Eastern Oyster | • Blue mussel | • Lake whitefish |
| • Marlin | • Cod | • White croaker |
| • Halibut | • Pollack | • Walleye |
| • Channel catfish (wild) | | |

Fish lowest in methylmercury:

- | | |
|---------------------|-------------------------|
| • Catfish (farmed) | • Trout (farmed) |
| • King crab | • Salmon (wild Pacific) |
| • Scallops | • Shrimp |
| • Fish sticks | • Tilapia |
| • Flounder (summer) | • Sardines |

***For more information on this or other related topics,
please visit: <http://www.meschinohealth.com>***

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