



# Mercury in Fish: Information for Health Professionals

Susan Donaldson, Water Quality Education Specialist

Kerry Seymour, Nutrition Specialist

Many reports about mercury contamination of fish and potential health effects have been published in recent years. This fact sheet and the accompanying publication for pregnant and nursing mothers, "Eating Fish: Making Healthy Choices" (FS-09-07), attempt to help you and your patients make good choices about eating fish.

Mercury is a naturally occurring substance found in the soil and atmosphere. Industrial processes such as the burning of coal, waste incineration and metal processing release mercury to the environment. Historic mining activities have released mercury into waterbodies. Mercury is also an important component of compact fluorescent bulbs and thermostats.

In water, mercury may be transformed by bacteria into methylmercury. When fish eat smaller organisms that contain methylmercury, the mercury accumulates in their muscle tissue. Fish that are long-lived, larger, and feed on other fish accumulate the most methylmercury and pose the greatest risk to people who eat them regularly. Fish living in water bodies with known mercury contamination are also likely to be higher in methylmercury.

Human exposure to methylmercury occurs primarily by way of fish consumption. Methylmercury is a neurotoxin. Because methylmercury is absorbed readily and excreted slowly compared to other forms of mercury, consumption results in accumulation in organisms.

In most cases, the risk of negative impacts from eating fish containing mercury is low for the general population of the United States. However, methylmercury exposure is specifically of concern for women who are pregnant, women who are trying to become pregnant or are breastfeeding, and small children. Methylmercury passes from the mother to the baby across the placenta, and to a lesser extent through breast milk. Some studies conducted in other parts of the world have shown nervous system effects associated with methylmercury exposure during fetal development.

To understand exposure, scientists focus on the mercury content of the fish species eaten, how often each species is eaten, and how much is eaten. Some fish species are known to be high in mercury and should be avoided. Others are low in mercury and pose less risk to humans.

In 2004, the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) issued a joint consumer advisory on methylmercury in fish. The advisory seeks to reduce the risk of mercury exposure in women who may become pregnant, pregnant women, nursing mothers and young children. At the same time, the advisory notes that fish are an important part of a healthy and balanced diet, and omega-3 fatty acids are important for brain development.

Additional benefits of eating fish include improvement of blood lipid profiles, decreased risk of heart disease, lowered blood pressure, improvement of conditions associated with rheumatoid arthritis, enhanced eye and brain development in early life, prevention of macular degeneration, lowered risk of type 2 diabetes and certain types of colitis, and improvement in neurologic and psychological disorders such as depression, schizophrenia and Parkinson's Disease (Ginsberg and Toal, 2008). Fish oils, especially docosahexaenoic acid (DHA), are associated with a number of beneficial effects in early life in particular (Ginsberg and Toal, 2008). Benefits include increased visual acuity in newborns and better scores on neurodevelopmental test batteries.

To manage risks associated with mercury consumption, the joint advisory recommends that women who may become pregnant, pregnant women, nursing mothers and young children avoid eating shark, swordfish, king mackerel or tilefish because they contain high levels of mercury. Fish from local waters that are known to be high

## Women who are pregnant, may become pregnant or are breastfeeding

- Eat two fish meals a week, each about 3 ounces cooked weight, or up to a safe total of 12 ounces a week.
- This can include up to 6 ounces of white albacore tuna or tuna steak each week
- Do not eat shark, swordfish, tilefish, king mackerel and any raw fish.
- Check and follow local advisories about the safety of locally caught fish, or limit to one fish meal a week total.

Omega-3 Fatty Acids and Methylmercury Levels in Commonly Eaten Fish (Ginsberg and Toal, 2008)		
Fish Species	Omega-3 <sup>a</sup> (mg/6 oz)	MeHg <sup>b</sup> (ug/g)
Cod, Atlantic	269	0.11
Flounder/sole	852	0.05
Halibut	1398	0.26
Herring, Atlantic	3424	0.04
Lobster	1129	0.24
Pollack	922	0.06
Salmon, Atlantic, farmed	3658	0.014
Sea bass	1295	0.27
Shark	1170	0.99
Shrimp	536	0.01
Swordfish	1392	0.97
Tilapia	240	0.01
Trout	1744	0.03
Tuna, canned, light	425	0.12
Tuna, canned, white	1462	0.35
Tuna, fresh, yellowfin	474	0.325

<sup>a</sup>Omega-3 fatty acid represents the sum of EPA and DHA. Source is USDA 2005 except shark data from Mozaffarian and Rimm, 2006.

<sup>b</sup>MeHg data from USFDA 2006; data for salmon reported as fresh/frozen and not distinguished according to source.

in mercury should also not be eaten. The advisory also recommends that women who may become pregnant, pregnant women, nursing mothers and small children eat up to two meals per week (of about 3 ounces each, or safely up to 12 ounces total) of fish that are low in mercury. Because mercury accumulates in muscle tissue, it cannot be removed by preparation techniques.

Individuals who consume fish that they have caught should be aware of health advisories associated with source waters. Mercury is present above detection limits in all fish tissue throughout the western U.S., and concentrations are higher in piscivores than nonpiscivores (Peterson and VanSickle, 2007). Many western streams and rivers have large piscivorous fish containing mercury at levels that are potentially risky to sensitive consumers such as children and pregnant women.

While the issue remains controversial, analysis of the benefits gained by eating fish, particularly by pregnant women and nursing mothers, indicates an overall positive effect when compared to the risks associated with methylmercury (Mozaffarian and Rimm, 2006). Health professionals can help patients select fish that are high in omega-3 fatty acids and low in mercury to maximize the benefits of eating fish.

Water Body	Species of Fish	Recommended Fish Meals/Month (1 meal = 6 ounces cooked weight)
Lahontan Reservoir	All	DO NOT EAT ANY
Carson River, Dayton downstream to Lahontan	All	DO NOT EAT ANY
Big and Little Washoe Lakes	White bass Carp	DO NOT EAT ANY 1 meal/month*
Rye Patch Reservoir	Walleye Wiper White crappie, carp, yellow perch, green sunfish, brown bullhead	DO NOT EAT ANY DO NOT EAT ANY 4 meals/month*
Chimney Dam Reservoir	Walleye Carp, white crappie Yellow perch	DO NOT EAT ANY 1 meal/month* 2 meals/month*
Comins Lake	Northern pike Largemouth bass Rainbow trout	DO NOT EAT ANY DO NOT EAT ANY 1 meal/month*

\* If patient eats any one of these, they should not eat any others in the same month.  
Recommendations from Nevada State Health Division; samples taken by Nevada Dept. of Wildlife. See [www.ndow.org/fish/health/index.shtm](http://www.ndow.org/fish/health/index.shtm) for more information.

## References

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