What is Mercury?

Mercury is a shiny, silvery, liquid metal found naturally in rocks and soils. The biggest man-made emissions of mercury come from the chlor-alkali industry (makes caustic soda, soda ash and chlorine). Other sources include coal and oil burning, mining and related activities, cement production and waste treatment and disposal.

In water, some bacteria convert mercury into a more toxic form, methylmercury. Methylmercury is one of the International Joint Commission's eleven critical pollutants, known to harm both humans and wildlife. Methylmercury makes its way up the aquatic food chain concentrating in higher amounts in larger fish and marine mammals.

How is Mercury Absorbed?

Methylmercury, as found in fish, is one of the most toxic forms of mercury and is very readily absorbed through oral intake. Mercury vapour, coming from dental amalgams, is also easily absorbed when inhaled, but very little liquid mercury is absorbed if taken orally.

Because mercury crosses the placenta, it can adversely affect the development of the brain and nervous system of the fetus.

What are the Health Effects?

Large doses of acute and chronic mercury exposure can be highly toxic to the nervous system and kidneys. Chronic, cumulative, low dose exposure may have subtle effects on mood producing symptoms, such as anxiety and depression and also may affect memory, thinking and nerve function, with possible tremor and reduced coordination. Such effects have been noted more frequently in dentists and dental personnel than in control groups. These effects may depend on the total body burden of toxic chemicals also known as the total toxic load.

Some studies have shown that with higher levels of methylmercury exposure from marine mammals during pregnancy, children have been found to have lower intelligence scores, delayed verbal and motor skills, impaired hearing and poor coordination.

How are You Exposed?

Exposure sources are as follows:

- ***Community***: Fossil fuel combustion (especially coal), waste water, dental offices, waste incineration, crematoriums, mining, ore smelting, pulp and paper mills.
- ***Home and Hobbies***: Batteries, barometers, electrical switches, broken glass thermometers, indoor paint (pre 1991), outdoor paint, damaged fluorescent lights, inks.
- ***Occupation***: Dental office staff, breakage of certain equipment in medical facilities, industrial workers that use mercury for manufacturing, waste management, ore smelting.
- ***Personal***: Dental amalgams (silver fillings), some cosmetics and soaps, used for rituals in some ethnic groups.
- ***Drugs***: Dental amalgams, preservatives in eye drops, ointments, topical antiseptics and nasal sprays.
- ***Diet***: Certain fish and marine mammals.

Special Exposure Risks

- Those in the community most at risk to mercury exposure are developing fetuses, breast fed infants and children. Effects on developing nervous systems can take place even at exposure levels where the mother remains healthy or suffers only minor symptoms. Therefore all women of childbearing age should limit exposure, due to the long persistence of mercury in the body. Any risk from mercury in breast milk does not outweigh the benefit from breastfeeding.
- Certain other groups in the population also have special exposure risks. These include those who have impaired kidney, liver or lung function, neurological disorders, the elderly and those with inadequate nutrition.
- Some studies have shown mercury-based vaccine preservatives cause local cutaneous reactions in 2–3% of the population, and so these have largely been removed.
- Those who subsist on fish and marine mammals need to be aware of the likihood of exposures to mercury and other toxic substances that concentrate up food chain.

Should You and Your Family Worry About Mercury Exposure?

The two questions most commonly asked concerning mercury are:

① **Should I eat fish?**

Fish are highly nutritious and are generally good for people's health. However, fish with high mercury levels should be avoided. In Canada, most commercial fish meet Canada's mercury guideline. The notable exceptions are swordfish, shark, king mackerel, tilefish, char, grouper and fresh or frozen tuna. Health Canada advises the public to limit intake of these fish to one meal per week. For young children and women of childbearing age, the limit is one meal per month. There is no current guideline for canned tuna, as the fish are smaller than fresh or frozen tuna. The United States Food and Drug Administration (FDA) measurements of canned tuna show variations in mercury levels which may lead to a new guideline for canned tuna. The lowest levels are found in salmon, shrimp, cod, haddock, whitefish, perch, sole and tilapia which can be eaten without concern about mercury.

② **Should I have my mercury amalgams removed?**

The debate concerning dental amalgams is ongoing, and for most healthy persons amalgams are currently thought to be safe. In some people, mercury vapour exposure from amalgam fillings may have negative effects. The daily exposure to mercury vapour from dental amalgams varies with their number, size and condition.

How much Mercury Exposure is Safe?

There is no established "tolerable daily intake" in Canada for mercury vapour inhalation. The United States Environmental Protection Agency has determined a reference concentration as has the World Health Organization. Their values will likely be adopted by Canadian regulatory agencies.

The Health Canada guideline for total mercury content in commercial fish and sea mammals is 0.5 parts per million. This guideline may not have taken into consideration effects on especially vulnerable subpopulations.

How Can Exposure to Mercury be Tested?

Hair mineral analysis of mercury gives the best measure of methylmercury accumulation from eating fish, but might not be useful for the vapour from amalgams. Blood mercury is reflective of exposures in recent days. 24-hour urine levels are more sensitive indicators of chronic exposure. In most people mercury is well below levels of concern.

What Can You do to Reduce Your Risk?

- Choose low mercury fish and follow the Health Canada guidelines.
- Anglers and those eating recreationally caught fish in Ontario should read the Guide to Eating Ontario Sports Fish (available at Government offices and beer stores) before eating any fish caught in Ontario lakes or rivers. There are restrictions on the consumption of certain fish species in many lakes and rivers.
- Health Canada advises against getting dental amalgams if you are: pregnant, have kidney disease, have amalgam allergic hypersensitivity, are less than 6 years of age or need fillings next to braces. It also advises against removing any tooth filling material in pregnant women, as doing so may expose them and their fetuses to mercury vapour. You have the right to decline mercury dental amalgams.
- Participate in mercury thermometer exchanges at hospitals and community-centres. Do not buy mercury-containing thermometers.
- If you break your mercury thermometer, keep all people and pets away from the spill area. To decrease mercury vapourization, turn off all heat sources in the house and maximize ventilation to the outside for at least two days. Do not use a vacuum or broom to clean up the spill – you will increase the spread. For more detail call the Canadian Coalition for Green Healthcare (416-596-0660).
- Check your private well and inform the public health department if there are concerns.
- Check labels of paints, plasters, joint compounds, adhesives and fungicides as mercury may be labeled under a different name.
- Check labels of personal care products.
- For proper disposal/recycling of fluorescent lamps, batteries, switches and electronic equipment call your local community collection office to deal with toxic waste, or inquire with your local municipal government.
- Teach children not to play with shiny, silver liquid.
- Keep mercury and mercury-containing products away from children.
- If your work involves mercury, ask your Occupational Health and Safety Officer at work whether you need to take special precautions to avoid bringing mercury home from work.

Where Can You Get More Information / Get Involved?

- Environment Canada (1-800-668-6767) www.ec.gc.ca
- Health Canada (613-957-2991) www.hc-sc.gc.ca
- Canadian Coalition for Green Health Care (416-596-0660) www.greenhealthcare.ca
- Centers for Disease Control and Prevention (1-800-311-3935) www.cdc.gov
- Canadian Food Inspection Agency (through Health Canada) www.inspection.gc.ca
- Guide to Eating Ontario Sport Fish (416-327-6816) www.ene.gov.on.ca/envision/guide
- Pollution Probe (416-926-1907) www.pollutionprobe.org
- Canadian Centre for Pollution Prevention (C2P2) (1-800-667-9790) www.c2p2online.com
- Environmental Health Clinic – Sunnybrook and Women's College Health Sciences Centre (416-351-3764) www.sunnybrookandwomens.on.ca
- South Riverdale Community Health Centre (416-461-2493) (Email: srchc@web.net)

Mercury Exposure:
Information for Patients

Environmental Health Committee
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357 Bay Street, Mezzanine, Toronto, Ontario M5H 2T7
Tel: (416) 867-9646 ✦ Fax: (416) 867-9990
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and

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