

Facts on mercury and fish consumption

Reason for posting: Fish is a healthy food choice. However, some predatory fish accumulate particularly high levels of mercury that can be toxic, particularly to developing fetuses.¹ Recent case reports of toxic exposure² and research suggesting that groups at risk may be unaware of past advisories³ reinforce the need to highlight Canadian recommendations for limiting the intake of contaminated species.⁴

The toxin: Elemental mercury from rocks and soil exists naturally in background levels in lakes and streams but is concentrated in the environment by emissions from hydroelectric projects, the burning of garbage and fossil fuels, and industrial pulp and paper and mining processes.³ Microorganisms in lake and stream sediments convert elemental mercury to organic methylmercury, which binds tightly to the proteins in fish tissue and is concentrated in fish higher up the food chain. When ingested by humans, methylmercury is easily absorbed and retained by the body; it has a half-life in blood of about 44 days, which makes blood tests useful measures of acute exposure.⁵ It concentrates in new hair, and consecutive hair segments indicate a person's exposure history.⁵ Methylmercury is eliminated fecally as inorganic mercury.⁶

Methylmercury is a potent neurotoxin, causing axonal demyelination.⁷ Adults can experience symptoms months after an acute exposure consisting of ataxia, blurred vision, hearing deficits and paraesthesias.⁷ Fetuses are particularly sensitive to methylmercury, as shown by the more than 1400 infants from the Minimata area of Japan who were acutely exposed in utero when their mothers ate fish contaminated by a factory discharge. The children, often normal at birth, developed abnormal reflexes, problems with suckling and swallowing, gait, speech, and mental retardation.³ The effects of chronic, low-level exposure, typical of many Aboriginal populations in Canada,⁸ is less clear

but is being explored in other countries. There is no effective treatment for methylmercury exposure.

Health Canada judges 0.5 parts per million (ppm) to be the limit for total mercury content in commercial fish.^{1,4} The consumption of mussels, pollock, salmon, scallops, shrimp and sole — the majority of aquatic species consumed in Canada — are not of concern. Fish with a total mercury content between 0.5 and 1.5 ppm include fresh and frozen tuna (but not canned tuna, which consists of smaller, shorter-lived species with lower mercury levels), swordfish and shark.¹ Rather than ban the sale of these species, Health Canada recommends that they be consumed no more than once per week, or once per month by children and women of child-bearing age.⁴ Mercury levels in freshwater fish varies, but in general bass, pike, muskellunge and walleye have high levels and should be eaten in moderation (provincial guidelines for sport fish often mirror federal seafood recommendations).⁹

What to do: Educating patients, especially those at highest risk (children and women of child-bearing age and populations traditionally consuming large amounts of fish), about the Canadian recommendations may be the best approach to preventing methylmercury poisoning. For patients who regularly consume sport fish, additional tips⁹ for

reducing methylmercury exposure include not eating fish organs (in which heavy metals accumulate), eating only the smaller fish of affected species, and relegating trophy fish to the wall, not the table. Although practices such as trimming off fat can reduce the intake of organic pollutants such as polychlorinated biphenyls, pesticides, insecticides and dioxins, mercury intake is unaffected because it is deposited uniformly throughout fish tissue.

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