Environmental Mercury Tied to Increasing Songbird Losses

By Dr. Mercola

By now you're probably well aware that environmental mercury has contaminated so much seafood that the US Food and Drug Administration (FDA) maintains an ongoing "do not eat" list for at-risk populations.

The mercury, which is a potent neurotoxin, among a plenitude of other adverse bodily effects, doesn't stop at seafood, however. Mercury is extremely persistent once in the air, water, and soil; levels gradually increase over time, as it accumulates.

In addition to seafood, mercury is now found at alarming levels in many other species. It's traveling up the food chain quickly and, even at sub-lethal doses, is threatening the future of songbirds, shorebirds, bats, and more.

Songbirds at Risk from Mercury Pollution

Biologists have been studying the effects of mercury exposure on fish-eating birds for decades, but it's become apparent that even songbirds are at severe risk.

Forest birds may eat insects that come from rivers (such as mayflies) or insects that eat river insects (such as spiders). As a result, some songbirds, including Caroline wrens and red-eyed vireos, have higher levels of mercury than shorebirds like kingfishers.[1]

Among songbirds living at the South River in Virginia, which was contaminated with mercury by DuPont from 1929 to 1950, the problem is particularly pronounced. Researchers from the College of William and Mary explained:[2]

"They had 20 percent fewer babies… Their songs are sung at the wrong pitch. Their hormone levels are altered. Their immune systems are suppressed."

In order to determine if it was, indeed, the mercury leading to these adverse effects (as opposed to another toxicant), the researchers measured the effects of sub-lethal doses of mercury on zebra finches… and found similarly devastating results.

The mercury-exposed birds had reduced reproductive success, with a 16 percent reduction in offspring produced in one year at the lowest dose of mercury (the equivalent of less than the amount found in a can of tuna).[3] At higher doses, a 50 percent reduction in offspring occurred, and all the birds had a harder time remembering where food was located. The researchers concluded:

"Our results indicate that mercury levels in prey items at contaminated sites pose a significant threat to populations of songbirds through reduced reproductive success."

Canadian Bird Eggs Contain Dangerous Levels of Mercury

The mercury threat exists across North America, where Alberta Health recently issued a health warning regarding the consumption of gull and tern eggs, which are sometimes eaten as part of the traditional diet.

The eggs, which were found downstream from oilsands (large deposits of crude oil), were found to contain dangerous levels of mercury, prompting health officials to warn pregnant women and children to limit their consumption.[4]

According to Environment Canada data, levels of mercury in eggs from waterbirds downstream from oilsands have increased nearly 50 percent in the last 30 years, and some species shown increases of up to 139 percent from 2009 to 2012.

It's unknown what levels of mercury exist in other traditional foods, such as moose, deer, or duck and goose eggs, which has officials calling for increased monitoring.

Shorebirds and Bats Are Also Being Poisoned by Mercury

At Onondaga Lake in Syracuse, New York, often referred to as the "most polluted lake" in the US due to 100 years of industrial dumping, the environmental toll of mercury pollution is also alarming. Mercury studies conducted by the Biodiversity Research Institute in Maine show that species both big and small – from spiders and beetles to bats and eagles – are teeming with mercury.[5]

The birds and bats are exposed via their diet. As they eat insects, clams, fish, and other invertebrates, they accumulate increasing amounts of mercury. Some of the birds had mercury levels so high that 20 percent of their offspring would not survive, while more than half of bats tested had enough mercury to experience "adverse effects." Results from the studies, which included testing of more than 400 birds and close to 300 bats, showed:[6]

- More than half of the bats had mercury levels high enough to cause behavioral changes
- Nearly half of tree-swallow eggs contained high levels of mercury
- Some spotted sandpipers contained so much mercury that two out of every 10 chicks would not survive

Mercury Fillings Are Decimating the Environment

Much of the research on mercury in the environment is being conducted near known toxic dumpsites, but the problem is by no means confined to these areas. Mercury pollution is widespread, and did you know that *dentist offices* are the largest source of mercury in wastewater entering publicly owned treatment works?

Once there, dental mercury converts to methylmercury, a highly toxic form of mercury known to be hazardous to brain and nervous system function, particularly in fetuses and young children.

Only about a dozen states—including Massachusetts, Connecticut, Maine, New Hampshire, Washington, Vermont, New York, Rhode Island, New Jersey, Oregon, and Michigan—require dentists to use amalgam separators to reduce mercury discharges. An amalgam separator is a wastewater treatment device installed at the source, in the dental office, that removes 95-99 percent of the mercury in the wastewater.

In 2010, the US Environmental Protection Agency (EPA) announced it would create a rule requiring *all* dentists who use dental amalgam to conduct best management practices and install amalgam separators. As originally proposed, EPA said the regulation would be finalized by 2012, but earlier this year they announced they may be withdrawing the proposal.

Abandoning the long-promised separator rule would be a horrid decision, especially when the EPA acknowledges that there are approximately 160,000 dentists in more than 120,000 dental offices who use or remove amalgam in the US, and, in their words, "almost all of [them]… discharge their wastewater exclusively to [publicly owned treatment works] POTWs."[7]

Dentist Offices Create 3.7 Tons of Mercury Waste a Year

Dental amalgam, a tooth filling material that is at least 50 percent mercury, is the leading intentional use of mercury in the US (this despite the fact that 52 percent of American dentists have stopped using amalgams). Dental offices generate a variety of amalgam waste that gets flushed down the drain, unless dentists implement best-management practices and dentists install and properly maintain amalgam separators. Such practices will collect:

- Scrap amalgam
- Used, leaking, or unusable amalgam capsules
- Amalgam captured in chairside traps and vacuum pump screens
- "Contact amalgam," including teeth with amalgam restorations

There's a growing global consensus that dental amalgam is a considerable source of environmental mercury pollution. Several studies show that about 50 percent of the mercury entering municipal wastewater treatment plants can be traced back to dental amalgam waste.

This mercury waste amounts to about *3.7 TONS each year!* An estimated 90 percent is captured by the treatment plants generally via sewage sludge[8] -- some of which ends up in landfills, while other portions are incinerated (thereby polluting the air) or applied as agricultural fertilizer (polluting your food), or seep into waterways (polluting fish and wildlife). In the infographic below, you can see that the mercury used globally for dental fillings is greater than that used for other major industrial uses, including lighting, electronic devices, and more.

There Are Far Safer Alternatives to Amalgam

It's high time that the FDA and the dental schools in charge of educating young dentists start acknowledging the dangers of mercury fillings for humans and for the environment. In addition to the widespread environmental pollution, there is overwhelming evidence showing mercury is easily released in the form of vapor each time you eat, drink, brush your teeth, or otherwise stimulate your teeth. These mercury vapors readily pass through your cell membranes, across your blood-brain barrier, and into your central nervous system, where they can cause psychological, neurological, and immunological problems.

The harms become all the more brazen when you learn that there are many superior alternatives to mercury fillings. One of the most popular alternatives to amalgam is resin composite, which is made of a type of plastic reinforced with powdered glass. It is already common throughout the US and the rest of the developed world, offering notable improvements over amalgam, as it:

- Is environmentally safe: Composite, which contains no mercury, does not pollute the environment. This saves taxpayers from paying the costs of cleaning up dental mercury pollution in our water, air, and land – and the costs of health problems associated with mercury pollution.
- Preserves healthy tooth structure: Unlike amalgam, it does not require the removal of significant amounts of healthy tooth matter. Over the long term, composite preserves healthy tooth structure and actually strengthens teeth, leading to better oral health and less extensive dental work over the long-term.
- Is long-lasting: While some claim that amalgam fillings last longer than composite fillings, the science reveals this claim to be baseless. The latest studies show that modern composite not only lasts as long as amalgam, but actually has a higher overall survival rate.

A lesser-known alternative is increasingly making mercury-free dentistry possible even in the rural areas of developing countries. Atraumatic restorative treatment (also called alternative restorative treatment or ART) is a mercury-free restorative technique that has been demonstrated a success in a diverse array of countries around the world, including Tanzania, India, Brazil, Zimbabwe, Turkey, South Africa, Thailand, Canada, Panama, Ecuador, Syria, Hong Kong, Mexico, Sri Lanka, Chile, Nigeria, China, Uruguay, Peru, and the United States. ART relies on adhesive materials for the filling (instead of mercury) and uses only hand instruments to place

the filling, making it particularly well suited for rural areas of developing countries – places where amalgam, which requires electricity, cannot be used.

The Environment Depends on a Phase-Out of Dental Amalgam

In order to protect human health and the environment, mercury should be phased out as soon, and as quickly, as possible. The international treaty, named the Minamata Convention on Mercury, requires the phasing out of many mercury-containing products, including thermometers, by 2020, and also calls for an end to all mercury mining within 15 years. It also includes a mandatory phase down of amalgam use. The treaty takes effect only after its ratification by 50 nations, which can take three or four years.

Instead of working for the phase-down and ultimate phase-out of amalgam use, the FDA and the American Dental Association (ADA) are pushing stalling tactics, saying that before phasing out amalgam we should go through a litany of diversions like (1) prevention of tooth decay, (2) research and mercury inventories, and (3) mercury waste management – none of which actually phase down amalgam use, as required by the Minamata Convention. These stalling tactics can appear attractive at first glance. But don't be fooled by the World Dental Federation: all three of their "amalgam phase-down measures" are designed to delay the demise of mercury fillings.

No more research is needed before we take action – the many effective, affordable, and available mercury-free alternatives have already been researched for over half a century, and we certainly don't need any more research telling us that mercury is a problem. And the realistic solution to waste management, of course, is to stop creating more mercury waste – i.e., stop using amalgam. Clearly, if the World Dental Federation gets its way, amalgam will be around for a long time. But groups like BAN Toxics, which is calling for an immediate ban on amalgam in the Philippines, and others are pushing to get mercury phased out around the globe quickly and for good.

Help Put an End to Mercury Pollution

Does your dentist use mercury fillings? On any patient? If so, it's time that he/she and you had a talk. Let's face it: the dental amalgam industry -- manufacturers and pro-mercury dentists -- are the biggest mercury polluters i9n America. It's time for every American consumer (1) to insist on mercury-free dental fillings, and (2) to spend his or her hard-earned dollars on the non-polluting dentist, the mercury-free dentistry.

The Campaign for Mercury-Free Dentistry, the project organized and led by Charlie Brown of Consumers for Dental Choice, has made amazing progress toward mercury-free dentistry. But there's still hard work ahead as Consumers for Dental Choice is now running education programs for consumers, holding training sessions for dentists, and organizing briefings for governments around the world. You can help stop dental mercury today! Will you please consider a donation to Consumers for Dental Choice, a 501(c)(3) non-profit organization dedicated to advocating mercury-free dentistry? Donations are tax-exempt and can be made online at www.toxicteeth.org. Checks can be mailed to:

Consumers for Dental Choice
316 F St., N.E., Suite 210
Washington DC 20002

For updates on the movement for mercury-free dentistry, join Consumers for Dental Choice on Facebook or sign up to receive their newsletter. You can also take a stand with us and tell the EPA not to let polluting dentists off the hook*: It's time to stop dental mercury dumping*.