

# From mad hatters to dental amalgams: heavy metals: toxicity and testing

By Pamela Levin, RN

**H**heavy metal toxicity is one of the biggest threats to health in the modern age. Why is this so, and how can individual exposure be determined?

“Heavy” metals are so named because of their specific gravity (the weight of a substance as compared with an equal volume of water). Some examples of heavy metals include aluminum, arsenic, antimony, cadmium, chromium, copper, gold, iron, lead, manganese, mercury, nickel, silver, tin, titanium, and zinc.

The number one source of exposure to heavy-metal poisoning used to be lead (chemical symbol Pb, atomic number 82). Today, however, lead has been replaced by mercury (chemical symbol Hg, atomic number 80). Mercury toxicity has been known at least since the first century when Roman prisoners were forced to work in cinnabar mines. That, they knew, was actually a death sentence, for they would be exposed to lethal levels of mercury in cinnabar.<sup>1,2</sup>

Also called “quicksilver,” mercury added to its considerable reputation in the early 1800s. At the time, the phrase “mad as a hatter” was in frequent use due to mercury-induced psychosis among workers exposed to it in the course of making hats.<sup>3</sup> Later, use of mercury to treat syphilis resulted in this same insanity.<sup>4,5</sup>

## What mercury can do

The effects of mercury are many. Mercury:

- reduces the effectiveness of antibiotics against bacteria;
- results in abnormally low-voltage electrocardiograms (in other words, it depresses heart function);
- contributes to intractable infections and pre-cancerous conditions (it exists in the nuclei of all cancerous and pre-cancer cells);
- boosts free-radical production, thus exacerbating radiation damage from X-rays and UV light;
- correlates significantly with the number of dental amalgam fillings of the mother in the liver, kidney, and brain of babies who die from sudden infant death syndrome (SIDS); and
- lowers levels of a number of brain neurotransmitters including serotonin, adequate levels of which are essential to assure control of impulses and emotions. Low serotonin contributes to depression, anger, anxiety, addictions, attention deficit, and suicide.

To summarize, mercury is:

- cytotoxic (kills cells);
- neurotoxic (kills brain and nerve cells, and inhibits production of neurotransmitters);
- nephrotoxic (toxic to kidneys);
- an endocrine disruptor (very little mercury depresses the pituitary gland, disrupts enzyme production processes and hormonal function);

- a cause of cardiovascular damage;
- a reproductive and developmental toxin that damages DNA, and inhibits DNA and RNA synthesis;
- damages sperm, lowers sperm counts, and reduces sperm motility;
- a cause of menstrual disturbances;
- a reducer of the blood supply to the developing fetus;
- a cause of reduced iodine uptake, hypothyroidism, and learning deficits;
- a cause of learning disabilities, and impairment and reduction in IQ; and
- a cause of immune-system damage resulting in allergies, asthma, and multiple sensitivities.<sup>6</sup>

## Limiting mercury exposure

While use of mercury has been outlawed or discontinued in many manufacturing processes and medical treatments, modern people are still massively exposed. According to the Environmental Protection Agency (EPA), dental amalgam is the primary source of exposure, emitting mercury 24 hours a day, 7 days a week.<sup>5</sup> As Boyd Haley, PhD, points out, “According to [an] NIH study, about 90% of the mercury in our bodies is elemental mercury, not methyl-mercury, showing the exposure is more likely from dental amalgams rather than fish.”<sup>5</sup>

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According to the World Health Organization and Health Canada, the level of mercury in people with amalgam fillings causes a body burden of mercury much higher than they would get from eating mercury-contaminated fish from Florida waters that carry government health warnings. (Less than a gram of mercury in a 10-acre lake would stimulate a warning not to eat the fish. Nearly half of Florida’s lakes now carry this warning.)<sup>7</sup> According to the San Francisco Environmental Commission, dental amalgam disposal is responsible for 65% of the mercury contamination in San Francisco Bay.<sup>8</sup>

Far down the list of mercury-exposure sources, in second place, is fish that are receiving far more press than are dental amalgams. The media are sending the message to limit consumption of certain fish, but are not warning people to have removed the primary source of exposure — amalgam fillings. Again, Dr. Haley: “We seem to like beating up on the fishing industry while leaving the dental industry alone.”<sup>5</sup>

A third source of mercury is drugs and vaccines. The flu vaccine contains mercury — of special concern regarding fetuses and newborns, since “mercury exposure from amalgams in a pregnant mother concentrates in the fetus, and a single vaccine given to a six-pound newborn is the equivalent of giving a 180-pound adult 30 vaccinations on the same day.”<sup>9</sup>

Fertilizer is now an additional source of mercury exposure due to the recent practice of “recycling” toxic waste by turning it into fertilizer, thus contaminating fields and the water tables under them. According to former U.S. Congressman Dan Hamburg (D-CA), California is one of only four states that regulates heavy-metal content in fertilizer. It currently regulates only arsenic, cadmium, and lead, however, and does not regulate mercury.

## Finding out if exposure has occurred

Given that exposure to heavy metals, especially mercury, is so common today and its effects are so devastating, it is well worth finding out what one’s current toxic-metal burden actually is. Happily, a number of methods can be used to discover heavy-metal toxicity, and many can be used in combination. These include:

**Checking signs and symptoms.** One way of assessing heavy-metal toxicity is to use the following indicators to assess a likelihood of mercury toxicity:

- how many silver amalgam fillings you have and how old they are (these are over 50% mercury);
- presence of root canals (which are up to 20% toxic metals, mainly mercury and lead);
- how often you consume fish and what types you eat;
- whether you
  - feel fatigued;
  - have any tingling or numbness around your mouth or face, or fingers or toes;
  - have problems with articulation of joints, headaches, tremors, difficulty hearing, memory loss, narrowing of your visual field, and/or problems with walking (such as balance difficulties, running into things);
  - suffer disturbances, which appear to be psychiatric in nature but can be caused by mercury toxicity, including mood swings, anxiety, agitation, mental confusion, quickness of temper, or depression;
  - suffer gastroenteritis, the most damaging result of ingesting inorganic mercury (mercury chloride); or
  - ingested elemental mercury as a vapor, which can cause acute lung injury and respiratory failure.
- People who are *severely* poisoned may lie in a mute, semi-rigid posture, able only to cry and exhibit primitive reflexive movements.<sup>10</sup>

**Blood, urine, or stool analysis.** For blood, urine, or stool samples to show toxic metals accurately, they must be preceded by a metals challenge before collecting the sample. In other words, a chelator is ingested that will stimulate cells to release the metals they contain. [Note: For a summary of these chelators and the process used, go to [www.nourishingcompany.com/articles](http://www.nourishingcompany.com/articles).] This includes bone cells — the body’s deep storage for dangerous toxins. Therefore, the body must be stimulated to release the toxins before they will appear in blood, urine, or stool. When such tests

do not show a metals problem — when there is one — is due to the failure to conduct a metals challenge before taking the sample.

Many health professionals do not know this and have even been tested themselves, yet were incorrectly reassured that they did not have a metals problem. For example, a whole Florida convention of dentists was recently falsely reassured in this way, as one of the companies manufacturing “silver” (translate: mercury) amalgam fillings offered free tests to demonstrate to the dentists how harmless their product is. (Again, “silver” amalgams can contain up to 50% mercury.) Since the dentists did not first challenge their bodies to release any held metals for a few days prior to collecting the specimen, the test was very unlikely to demonstrate a problem, and this proved to be the case. The average concentrations of total mercury in non-exposed people is about eight parts per billion in blood.

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**Other tests.** Various other tests are thought to indicate a high potential for heavy-metal poisoning (including mercury) include the following:

- elevated MCH and MCV on a CBC (complete blood count);
- immune tests — Low CD8 cells, elevated CD4/CD8 ratio;
- low absolute number of NK (natural killer) cells;
- serum IgE elevated above normal range;
- elevated urinary d-glucuric acid;
- elevated urinary 3-methylhistidine;
- elevated serum ALT and/or AST;
- low serum superoxide dismutase (SOD);
- changes in fractionated urine porphyrins; and
- high urinary mercapturic acid.<sup>11</sup>

**Hair analysis.** Toxic metal levels can be determined through sending a snippet of hair to a laboratory for assessment. For example, for under \$60, one company assesses nine toxic elements: aluminum, antimony, arsenic, bismuth, cadmium, lead, mercury, nickel, and tin.<sup>12</sup>

Some shampoos, all hair dyes, bleaches, perms, and straighteners affect the accuracy of the tests. According to Doctor’s Data labs, which performs hair analysis, “Elevated levels of several elements (Al, Ni, Ag, Sn, Co, Ti, and Sr) may be due to hair treatments ... (Grecian Formula 44) and selenium-based dandruff shampoos (Selsun Blue) are well known to dramatically affect lead and selenium, respectively.<sup>13</sup> A number of other shampoos, or even dyes, may have minimal or no effect.<sup>13</sup>

In addition, Doctor’s Data labs reports, “There are other hair-darkening products besides Grecian Formula that contain lead acetate. Some of the straighteners can cause contamination. Sulfur-containing shampoos can affect Se, Zn, and Ti. Many shampoos will have little or no impact on element levels. Johnson’s Baby Shampoo is often recommended and can allow more standardized collection.”<sup>13</sup>

Hair-analysis-test results reflect the person's condition for the last three months. Average hair concentrations in non-exposed people are two parts per million.<sup>13</sup>

**Muscle testing.** The process of using an indicator muscle can demonstrate not only *whether* your body has a toxic metal problem, but also through resonance testing can indicate *what* metals are present and *where* they are in your body. If you have a particular symptom, say leg cramps, hot flashes, a tired heart, or blood-sugar levels that keep fluctuating, a trained practitioner can perform a resonance test to find out if there are toxic metals in your leg muscles, your autonomic nervous system, your heart, or your pancreas, for example. Last, muscle testing can be used to determine which of the variety of products that chelate these metals will be effective. Whichever supplements are used, the aim is to aid in the detoxification process and get back to full strength. □

Pamela Levin, RN, is a health practitioner, and an award-winning nutritional journalist with over 40 years in the health field. This article was excerpted from her copyrighted book *Lighten Your Load: How to Release Your Toxic Metal Burden* available at [www.freeoftoxicmetals.com](http://www.freeoftoxicmetals.com). She is also the author of *The Female Hormone Journey: Lifetime Care of Your Hormones*; *Perfect Bones: A Six-Point Plan for Healthy Bones*; *The Cycle of Life: Creating Smooth Passages in Every Life Season*; and *Cycles of Power: A User's Guide to the Seven Seasons of Life*. Her articles and books on physical- and emotional-health improvement have been translated into 10 languages.

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## Mad as a Hatter

In Lewis Carroll's book, *Alice's Adventures in Wonderland*, Alice imbibes in potions that make her very tall and very small. She also takes tea with the "Mad Hatter." Carroll did not coin the phrase as he wrote his book; it was already in use as early as 1837 within the felt-hat industry where mercury was introduced to speed the production process. Various tales exist about how mercury initially came to be used, but by the 19th century, hat makers were using solutions of mercuric nitrate and mercury poisoning was becoming endemic.

With some 56 factories producing 5 million hats yearly, Danbury, CT, was an important center of America's hat-making industry — until men's hats became unfashionable in the 1960s. Workers there were exposed to mercury nitrate as they separated fur from



the pelt in a process called "carrotting" because of the orange color of the solution. The "Danbury shakes" were known regionally; and, like the "mad hatters" in France and England, long-term mercury exposure meant they suffered mercury poisoning, which attacks the central nervous system.

Those who were poisoned exhibited symptoms and ailments that include drooling, uncontrollable muscle twitching, a lurching gait, difficulties in talking and thinking clearly, and hair loss. In the worst cases, some experienced hallucinations. Because many victims stumbled around in a state of confusion with slurred speech and shaking hands, they were mistaken for drunkards. The U.S. Public Health Service banned the use of mercury in the American felt industry on December 1, 1941.