Lead

Lead, a heavy metal, has no known functions or health benefits for humans. Lead, by its nature, is toxic to humans and other forms of life. It is considered a metabolic poison (meaning it inhibits some of the basic enzyme functions) and untold ills: damage to the kidneys and liver, and to the nervous, reproductive, cardiovascular, immune, and gastrointestinal systems. In children, as scientists have recognized, lead has a particularly damaging effect.

At low levels, it reduces a person's intelligence, makes it difficult to concentrate or pay attention, and harms hearing. According to a recent study in the *Journal of the American Medical Association*, lead may be even more dangerous than previously thought, causing high blood pressure and kidney impairment at unexpectedly low levels. The lead level proved more closely linked to hypertension than several other factors that have been implicated in other studies, including smoking, alcohol, and salt in the diet. These effects are permanent. At higher levels, lead has many additional severe effects, including kidney disease, blindness, seizures, and death.

In young or unborn children, at very low levels, lead reduces height, weight, circumference of chest and head; damages hearing; reduces the body's ability to manufacture an essential component of red blood cells (called heme); causes hyperactivity; interferes with an important blood enzyme; and interferes with the body's use of vitamin D. Lead consumption in childhood can lead to a lower IQ and impairment in reading, writing, math, visual and motor skills, language, abstract thinking, and concentration. Children may also suffer irritability, insomnia, colic, and anemia. Damage to the child's nervous system is permanent. Children are particularly susceptible to lead's toxic effects because they absorb lead more readily than adults do. Lead can also cross the placental barrier, passing from a pregnant woman's blood to the blood of the fetus; red blood cells of fetuses attract and hold lead more readily than do red cells of adults.

What is even more frightening is recent discoveries about the dangers of lead poisoning for children. Exposure to the toxic metal may contribute to crime and anti-social behavior in children. Boys with high levels of lead in their bones were more likely to engage in bullying, vandalism, setting fires, and shoplifting than those with low lead levels. According to Dr. Herbert Needleman, a psychiatrist at the *University of Pittsburgh Medical Center*, "Lead is a brain poison that interferes with the ability to restrain impulses." Lead is known to interfere with development of the central nervous system, and

previous studies have linked exposure in children with learning disabilities, restlessness, and the tendency to be distracted. As a result of this new study, the researchers concluded that limiting children's exposure to lead could help prevent them from becoming criminals as adults. According to Dr. Peter Montague of the *Environmental Research Foundation*, studies have found that lead in water is possibly the largest source of lead in the human blood stream. But how does lead get into our water? Older homes may have lead pipes that leach lead into the water. Newer homes may have copper pipes, but those copper pipes may also be joined with lead solder, which may also leach lead into the water. If you suspect that lead is in your drinking water, you should have your water tested. Data obtained from your local public water utility may not be of help, since most lead is picked up after the water has left the public water facilities. Public utilities are advising households that have high levels of lead in their tap water to invest in a water filter that can effectively reduce lead.

Mercury

Like lead, mercury is a heavy metal that can have serious health effects. It is an inorganic contaminant that may get into water supplies via natural deposits or through crop run-off or may seep into water supplies near spills and toxic waste sites that are contaminated with mercury. Once mercury has entered the body, it may be months before all of it leaves. At lower levels, Mercury can cause kidney and nervous system disorders. Long-term exposure can permanently damage the brain, kidneys, and developing fetuses. According to the Hall Water Report, "Pressure is building for EPA to release an overdue report on mercury that suggests the metal is more potent and widespread as a public health threat than previously believed, estimating that 85,000 American women are being exposed to mercury at levels high enough to affect the brain development of unborn children."

Notes

- zinc = 1 - 5 mg/L is considered common
- Some of the information included in this document are from the EPA's *Safe Drinking Water Information Center's* publications and web site (1-800-LEAD-FYI, http://www.epa.gov).