

LEAD POISONING

Lead is a metal that was once used in paint, gasoline, water pipes, and many other products. Lead was removed from these products once it was discovered to be very dangerous.^[1] In 1978, lead-based paint was banned for use in housing.^[2] However, there are still a number of ways to be exposed to lead. Even though lead is no longer added to these products, the removal of lead did not eliminate the hazard that is still at risk with the existing paint, plumbing systems, and lead contaminated soil and dust.^[3] Lead is still considered a criteria pollutant because there are still emissions from lead smelters and aircraft operating on leaded aviation gasoline.^[4]

SOURCES OF LEAD

People are exposed to lead from lead-based paint, contaminated soil, dust, drinking water, and contaminated air.^[1] All houses built before 1978 are expected to contain some lead-based paint.^[2] The most common source of lead exposure occurs at the home when lead-based paint begins to deteriorate, peel, or is disturbed by either scraping or sanding. When this happens, it produces dust containing lead. If inhaled or swallowed, even the smallest particle can be dangerous. Exterior paint used on houses is higher in lead content than paint used inside. Exterior paint can become accessible indoors through windowsills. The lead particles from the paint flake off and settle on the windowsills and people are poisoned by inhaling and ingesting these particles.^[3]

Lead is found in outdoor air from vehicles containing leaded gasoline or industrial sources such as smelters, waste incinerators, and lead-acid battery manufacturers. Once it is released into the air, lead can travel long distances before settling on the ground and sticking to soil particles. Depending on the type of lead compound, lead can enter into groundwater from the soil.^[5]

PREVENTION OF LEAD POISONING

Lead poisoning is most common in children and people exposed to lead at their job. Determine when your house was built; where your child spends most of their time is important. If your house was built before 1978, talk to your local health department about testing paint and dust for lead. If the house tests positive for lead, there are some things you can do to decrease exposure to lead:

- Make sure your child does not have access to paint that is peeling or surfaces they can reach with lead-based paint.
- If your house is being renovated, make sure pregnant women and children are not present.
- Wash children's hands and toys often.
- Regularly wet-mop floors and wet-wipe window sills instead of sweeping or dusting because dust is a major source of lead.^[2]
- Do not remove lead by yourself. Instead, find a qualified lead abatement professional to come and remove it.^[3]

Another form of prevention is to eat right. Children who get enough iron and calcium will absorb less lead. Foods that are high in iron include eggs, red meats, and beans. Foods that are high in calcium are dairy products, dark green vegetables, seeds, and nuts.^[4]



HEALTH EFFECTS IN CHILDREN

Lead poisoning was once focused on adults exposed to high doses while working in industrial settings. Now, the focus on lead poisoning has shifted to children who are exposed to low doses who experience no symptoms.^[7] Lead poisoning is known for mainly affecting children's development. However, lead can affect virtually all systems within the body. Blood lead levels at low levels can harm mental and physical development, lowering IQ levels, shortening attention spans, and increasing behavioral problems. At high levels, lead can cause convulsions, coma, and even death.^[1]

Typically, low doses of lead have no symptoms. The highest accepted threshold for lead in children is 60 micrograms per deciliter ($\mu\text{g}/\text{dl}$). If there are blood lead levels greater than 60 $\mu\text{g}/\text{dl}$, symptoms become more noticeable in children. Common early complaints are abdominal pain, joint pain, clumsiness, headaches, and behavioral changes.^[7]

Children are more prone to lead poisoning than adults for many reasons. First of all, their exposure is increased because they are more likely to put lead-contaminated objects, including their own hands after handling lead dust, into their mouths.^[1, 7] Second, children's intestinal tracts absorb lead easier than the intestinal tracts of adults. Finally, a child's central nervous system is still developing, making it more susceptible to toxins than a mature central nervous system.^[7]

HEALTH EFFECTS IN ADULTS

Although children seem to be the main focus with lead poisoning, adults can be affected as well. Lead can affect the peripheral and central nervous systems, the kidneys, and blood pressure.^[7] People who are experiencing peripheral and central nervous system issues have symptoms such as motor clumsiness, clouded consciousness, weakness, and paralysis. Those effects are typically caused from an occupational exposure to lead.

Acute lead poisoning has been known to be associated with hypertension, heart disease, and renal failure.^[7, 8] Lead has adverse effects on the male and female reproductive systems. In males, lead can decrease sperm counts. Studies have proven that lead can increase the risk of stillbirths, neonatal deaths, and decrease the fertility rate in women.^[7] Keep in mind; those studies were done in the 19th century with factory workers in the ceramic industry. The majority of women are not exposed to such high levels of lead except for in certain occupational settings.^[7]