Lead Poisoning: Childhood Health Effects

There is no safe level of lead, because it can cause chronic and acute health impacts in children at any level of exposure. New York State ranks highest in the U.S. for the number of children who test positive for elevated lead levels every year.

Continuum of Lead Exposure Symptoms[1]

Lowest Exposure

- Learning and memory challenges, lowered IQ
- Decreased verbal ability
- Early signs of hyperactivity or ADHD
- Impaired speech and hearing functions

Low Exposure

- Irritability
- Lethargy
- Mild fatigue
- Muscle aches
- "Pins and needles"
- Occasional abdominal discomfort

Moderate Exposure

- Joint pain
- Constipation, vomiting
- Difficulty concentrating/ muscular exhaustibility
- Diffuse abdominal pain
- General fatigue
- Headache
- Tremors
- Weight loss

High Exposure

- Intermittent, severe abdominal cramps
- Paresis or paralysis
- Encephalopathy —may abruptly lead to seizure,
- Change in consciousness
- Coma
- Death

Lead primarily enters a child's body through ingestion as a result of normal hand-to-mouth behavior and inhalation of lead dust. As exposure increases, the lead accumulates in the body and symptoms intensify.

Pica behavior – eating non-food items, and seen more often in children living in low socioeconomic situations – can increase lead exposure.[3] Pica may result from iron and calcium deficiencies,[4] both of which can contribute to increased lead absorption, thereby making such children more likely to consume lead and absorb it.

Children's bodies are more likely than adult bodies to absorb lead that has been ingested: **Up to 100% of lead a child ingests can be absorbed on an empty stomach**, as opposed to 60-80% in adults.[5] The rate of lead absorption in the body's hard tissue (bones, teeth) and soft tissue (brain, spleen, kidneys, liver, and lungs) is higher in children than in adults.

"There is no such thing as a 'normal' lead level, **only that level which we are willing to tolerate."**

- Oregon Health Authority[2]

Sources of Lead

- House paint and dust from deteriorating paint (e.g, around doors and window sills)
- Construction dust during home renovation or repair
- Soil around a dwelling that has been contaminated from paint chips and leaded gas deposition
- Toys made pre-2008 when federal lead limits for children's products decreased
- Food (such as recently found in cinnamon)
- Drinking water via lead pipes and pipe fittings
- Pica behavior (see above)

References

1. Centers for Disease Control Agency of Toxic Substances and Disease Registry, "Lead Toxicity Clinical Assessment – Signs and Symptoms" www.atsdr.cdc.gov/csem/leadtoxicity/signs_and_symptoms.html
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4. Cleveland Clinic, "Pica" my.clevelandclinic.org/health/diseases/22944-pica
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For more information contact gabby@cleanhealthyny.org LeadFreeKidsNY.org

Lead Poisoning: Adult Health Effects

Lead exposure is responsible for as many as 400,000 US cardiovascular deaths each year.[6]

Lead can cause chronic and acute health impacts. **There is no safe level of lead.** Lead enters the body through inhalation and ingestion.

Low-level lead exposure is a **significant contributor to adult ischemic heart disease and cardiovascular disease**.

Lead is stored and accumulated in the bones. **Lead absorbed into bones in childhood can be released back into the blood later in life** due to:[7]

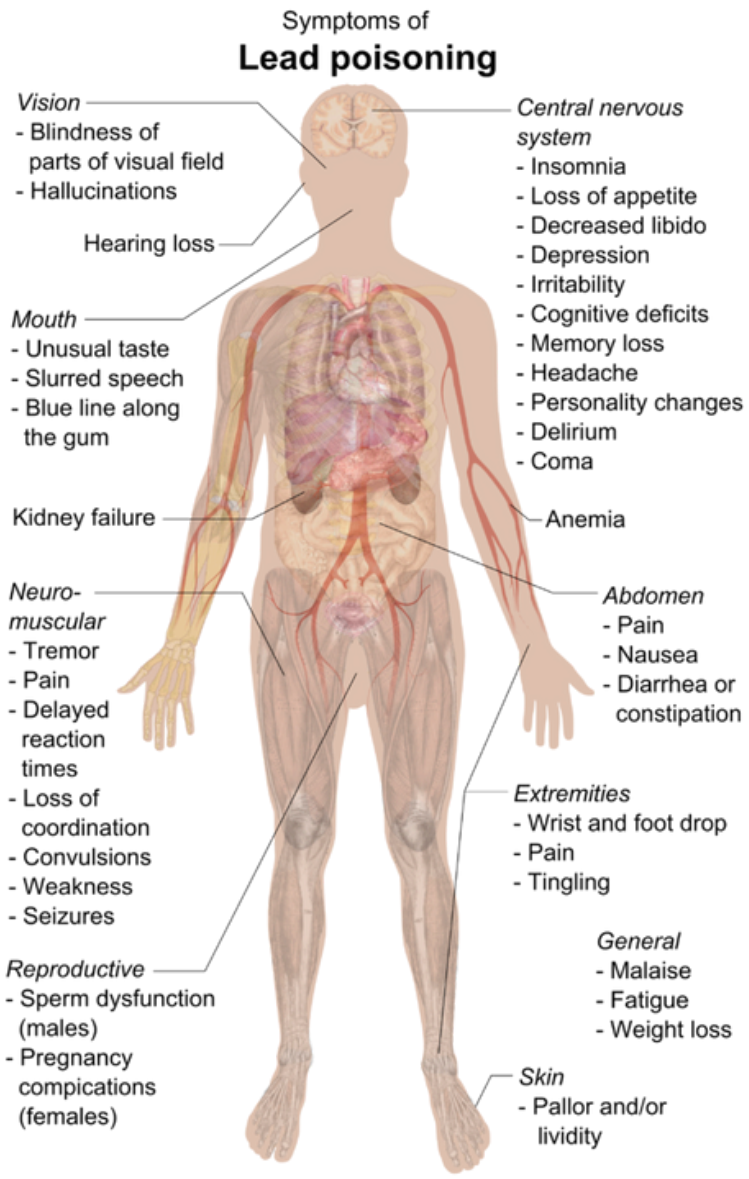
- advanced age
- broken bones
- chronic disease
- hyperthyroidism
- immobilization (bedridden, etc.)
- kidney disease
- lactation
- menopause
- physiologic stress
- pregnancy

Calcium deficiency worsens bone-to-blood lead mobilization.[8]

Pregnant people absorb up to 85% of the lead they are exposed to.[9] Lead can cross the placenta into a developing fetus. This means that people who were exposed to lead in childhood or during pregnancy can transfer that lead to the fetus during pregnancy. Lead can also be transferred to a baby during breastfeeding.

Some adults are exposed to lead from house paint on the job, including during home painting, repair, renovation, construction, plumbing, and wire and cable installation.

Adults exposed to lead on the job can unknowingly bring lead dust from their clothes, shoes, or bodies into their homes, putting their families at risk of exposure, too.



Source: Mikael Häggström - Own work, CC0, https://commons.wikimedia.org/w/index.php?curid=40804069

References

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7. CDC Agency of Toxic Substances and Disease Registry. "Lead Poisoning: What is the Biological Fate of Lead in the Body?" www.atsdr.cdc.gov/csem/leadtoxicity/biologic_fate.html
8. ibid.
9. Oregon Health Authority, "Health Effects of Lead Exposure." www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/HEALTHYNEIGHBORHOODS/LEADPOISONING/MEDICALPROVIDERSLABORATORIES/Documents/introhealtheffectsmedicalprovider.pdf