

▶ **DIRECT FROM CDC** ENVIRONMENTAL HEALTH SERVICES



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## Educating Communities, Families, and High School Students About Lead Exposure as a Public Health Problem

**Editor's Note:** The National Environmental Health Association strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC's Water, Food, and Environmental Health Services Branch, as well as guest authors, will share tools, resources, and guidance for environmental health practitioners. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

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One major public health achievement in the U.S. is lead exposure reduction among children but many remain at risk. Lead is a naturally occurring metal that has become a widespread environmental health hazard due to its broad use in industrial and commercial applications. Exposure to lead can seriously harm the health of children. The effects can include damage to the brain and nervous system, slowed growth and development, and learning and behavior problems. No safe blood lead level has been identified and adverse health effects have been documented for very low-level exposures. Children younger than 6 years are especially vulnerable because of their hand-to-mouth behavior and rapidly developing brains and nervous systems (LeBlanc et al., 2022; Wani et al., 2015). Though lead was banned in house paint in 1978 and in gasoline for on-road vehicles in 1996, additional routes of exposure have been identified.

Increasing lead use in industries and the expansion of global trade have opened additional exposure routes. Lead has been traditionally found in plumbing pipes, in paint in older homes, and in industries such as construction, mining, and manufacturing (Centers for Disease Control and Prevention, 2023). Toys, jewelry, cosmetics, food, and products imported from other countries might also contain lead, which has attracted additional attention with the expansion of global trade. Parents employed in industries that use lead (such as automotive repair and construction work) or those engaged in certain hobbies (such as hunting, fishing, and some arts and crafts) can inadvertently bring traces of lead into the home or vehicles on shoes or clothing. This situation can create potential risks to young children. Lead exposure is still a public health threat with long-term consequences for children, families, and society—but it may be under-recognized.

Children within populations with lower access to economic and social advantages or who live in lower-income households bear a disproportionate risk of exposure because they are more likely to live in housing built before 1978, which could contain leaded paint and plumbing (Woolf & Brown, 2022). Children might also lack access to foods rich in iron and calcium, which could block lead absorption (Hauptman et al., 2022). Additional populations, such as children who are recent immigrants or refugees, might be exposed to risks such as imported goods with high levels of lead.

### Working With Partners to Raise Awareness About Lead

The Centers for Disease Control and Prevention (CDC), in partnership with the American Academy of Pediatrics, developed two community lead exposure prevention education videos suitable for posting online, sharing on social media, and disseminating via other opportunities to reach general audiences. These videos provide brief overviews of what lead is, where it is found, and why it is important to protect young children from exposure. One video was created for high school students at the 10th grade level. The language and content are specifically crafted to appeal to the 15–16-year age group. The other video is designed for parents, teachers, and people employed in many occupations that would benefit from this information, including real estate agents, plumbers, construction workers, and others.

Closed captions for the hearing impaired and 508 compliant versions for the visually impaired are available for each video. The videos are posted on the CDC website and

FIGURE 1

### Definition and Information About Lead

**What is Lead?**

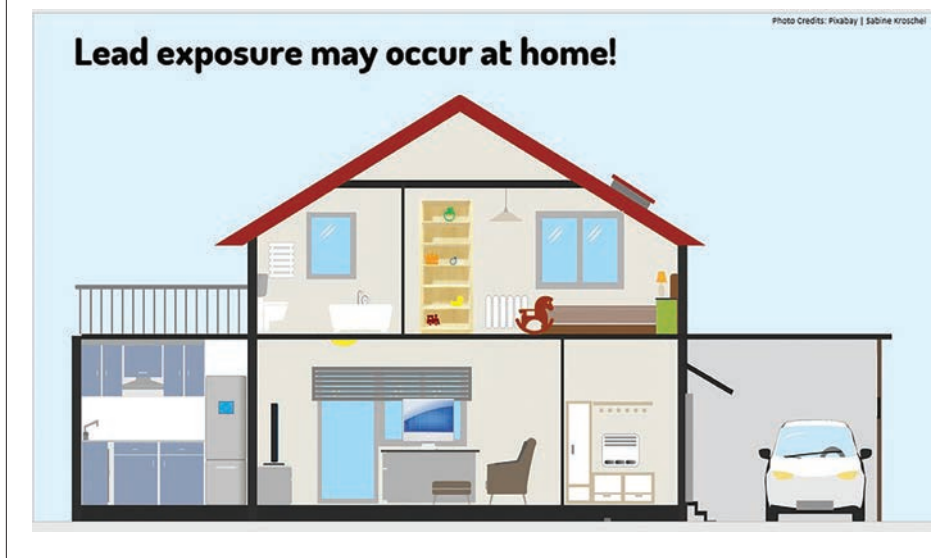
Lead is a metal that occurs naturally in the environment. The symbol Pb is an abbreviation of the Latin word for lead, *plumbum*. Lead is solid at room temperature. Its atomic number is 82 and atomic weight is 207.2.

**Lead is used in industrial and consumer products. Lead poisoning happens when lead is absorbed into the body over time. Even small amounts of lead can cause health problems.**

Sources: Encyclopedia Britannica & CDC Blood Lead Levels in Children, <https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm>, Updated October 27, 2021. Accessed December 3, 2021.

FIGURE 2

### Example of the Room-by-Room Tour of a Home That Points Out Potential Sources of Lead Exposure



include links to resources that can be shared via newsletters, through listservs, and in webinars and conferences. The videos are posted at [www.cdc.gov/nceh/lead/resources/lead-poisoning-prevention-training.htm](http://www.cdc.gov/nceh/lead/resources/lead-poisoning-prevention-training.htm).

- The videos include:
  - **Childhood Lead Poisoning Prevention Education: Heads Up for High Schoolers**

Using graphics and age-appropriate narration, this animated video shows how and where people can be exposed to lead. It also demonstrates how lead poisoning is harmful to children, adolescents, and adults. It begins with a definition of lead (Figure 1) and where it is found in the environment. The content demonstrates

that lead exposure is harmful to everyone and affects multiple organs in the body, including the brain, kidneys, liver, blood, and reproductive systems. The video emphasizes that children under 6 years are most vulnerable to lead.

In addition, the video takes an in-depth, room-by-room tour of a sample home and points out different places that can be a potential source of lead exposure (Figure 2). The content also provides a comprehensive list of occupations and industries known for potential lead exposure and other sources of exposure including toys, jewelry, and cosmetics. The video also shares a list of action items for adolescents to get involved in preventing lead exposure.

- **Childhood Lead Poisoning Prevention: Information for the Community**

The purpose of this video is to show that lead exposure is a major public health problem and to highlight its continuing impact on children and adults (Figure 3). It reviews the sources of lead exposure, the major short- and long-term health outcomes of exposure, and how to help protect children from lead exposure.

Some of the highlights include the adverse effects of lead poisoning by blood lead level and the impact lead exposure has on adults and children. The video describes age-specific developmental impacts on children affected by lead exposure, from preschool through high school, which include attention deficits to high-risk behaviors. In addition, the video provides information for home buyers, renters, and landlords regarding potential exposures in housing. It also describes lead-safe behaviors, including dietary recommendations and handwashing (Figure 4).

### Knowledge and Awareness Is Essential to Prevention

Many parents and caregivers of children, as well as the general public, may not be aware that childhood lead poisoning is still a public health threat with long-term negative consequences for children, families, and society. The good news is that lead poisoning is preventable. Awareness and education are important components for initiating behavior changes and taking actions to prevent lead exposure at the community level (Arlinghaus & Johnston, 2018). These videos take a much-needed step

toward health equity and promote health self-advocacy related to lead exposure in populations that can benefit the most. ✨

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FIGURE 3

**Impact of Lead Exposure on Children and Adults**

**Impact of Lead Exposure: Adults and Children**

Children, especially those younger than 6 years old, are more vulnerable to lead poisoning but everyone is affected by lead. Even low levels of lead in a child's blood may cause lifelong health effects such as lower IQ, decreased growth, and decreased hearing. These effects may continue into adolescence and contribute to challenges in educational advancement.

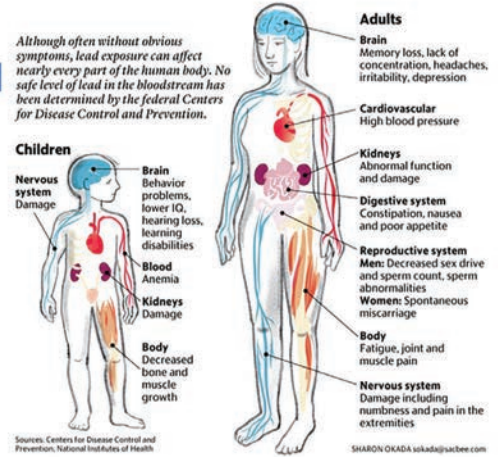


FIGURE 4

**Lead-Safe Behaviors**

**Lead-Safe Behaviors**

- Eat foods rich in iron, calcium, or vitamin C to help prevent lead absorption.** 
  - Lean meats and chicken (iron)
  - Milk, yogurt, and cheese (calcium)
  - Oranges, grapefruit, and tomatoes (Vitamin C)
- Keep it Clean.** 
  - Frequent hand washing
  - Clean window frames and floors with a damp cloth.
  - Let water run for 2–3 minutes before drinking it if you have lead piping.
- Put barriers between lead and children.** 
  - If you work or participate in an industry with possible lead exposure, wear an outer layer of clothing you can remove prior to entering your home, car, or business.

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Did You Know?

Our new Health in All Policies (HiAP) Preparedness Guide provides a framework to take a HiAP approach to public health preparedness to improve the depth and effectiveness of collaboration at all stages of a response. Environmental public health officials can use the HiAP framework detailed in our guide to create a multisector approach to disaster preparedness. Visit [www.neha.org/hiap-preparedness-guide](http://www.neha.org/hiap-preparedness-guide) to view the guide and download the available worksheets.