

DATE:	October 6, 2022
TO:	Health Alert Network
FROM:	Denise A. Johnson, M.D., FACOG, FACHE Acting Secretary of Health
SUBJECT:	Lead Exposure in Adult Pennsylvanians
DISTRIBUTION:	Statewide
LOCATION:	Statewide
STREET ADDRESS:	n/a
COUNTY:	n/a
MUNICIPALITY:	n/a
ZIP CODE:	n/a

This transmission is a “Health Advisory” provides important information for a specific incident or situation; may not require immediate action.

HOSPITALS: PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, INFECTION CONTROL, NURSING AND LABORATORY STAFF IN YOUR HOSPITAL EMS COUNCILS: PLEASE DISTRIBUTE AS APPROPRIATE; FQHCs: PLEASE DISTRIBUTE AS APPROPRIATE; LOCAL HEALTH JURISDICTIONS: PLEASE DISTRIBUTE AS APPROPRIATE; PROFESSIONAL ORGANIZATIONS: PLEASE DISTRIBUTE TO YOUR MEMBERSHIP

Summary

- The greatest source of lead exposure for adult Pennsylvanians is in the workplace.
- Other non-workplace sources of lead exposure, such as home renovation projects or hunting, may also occur.
- Lead exposure can result in negative health consequences for adults and children, impacting many organs of the body. Important symptoms include headache, fatigue, loss of concentration, dizziness, vomiting, and joint and muscle pain.
- Adult lead exposure may result in lead exposure among children and other family members – take-home lead exposure
- Adult healthcare providers should consider lead toxicity as a possible cause of illness during diagnosis. Patient information on sources of lead exposure should be collected and blood lead tests may be recommended to determine if a patient’s blood lead levels (BLLs) are elevated.
- Patient follow-up is critical. It is important to discuss the consequences of lead exposure and ways to reduce exposure and take-home exposure.
- For more information on adult lead exposure in Pennsylvania, visit [Lead \(pa.gov\)](https://www.pa.gov/lead), or contact dehe@pa.gov.

Overview

For both children and adults, exposure to lead can result in negative health consequences that may impact many organ systems. Signs of lead poisoning in adults include dizziness, loss of concentration, headaches, nausea and vomiting, and fatigue. These symptoms may be worsened by smoking. The primary source of lead exposure in adult Pennsylvanians is occupational exposure. Other non-occupational sources can also contribute to adult lead exposure. It is important to monitor lead exposure through venous blood lead tests and to reduce lead exposure when blood lead levels (BLLs) are

elevated. Both adult and pediatric healthcare providers should collect information from patients, such as their workplace and hobbies, to help determine if lead may be contributing to adverse health outcomes.

Background

Lead is a naturally occurring toxic metal and has been traditionally used in pipes, paint, and gasoline due to its resistance to corrosion, malleability, and other properties. Although the use of lead has been banned in many materials due to its adverse health effects, it is still used as an additive in battery manufacturing, bridge paint, and metal alloys.

Lead cannot break down and serves no biological function in the body. Therefore, no level of lead is safe. Over time, lead can accumulate in bones, circulate in the blood, and cause damage to major organs and organ systems. Lead can harm the brain and result in symptoms such as loss of concentration, headache, and difficulty remembering. Other side effects of lead exposure include fatigue, anemia, nausea, and joint and muscle pain.

Individuals working in furniture restoration, construction and automobile repair, metal smelters and foundries, bridge sanding and painting and battery manufactures are among those at greatest risk. These industries employ upwards of 500,000 people in Pennsylvania. Monitoring workplace lead exposure is important and can be done by taking a venous blood sample to test for BLLs. Test results of BLLs ≥ 5 $\mu\text{g}/\text{dL}$ are reportable to the PA DOH by law (28 Pa. Code \S 27.34). The annual prevalence rate of BLLs ≥ 25 $\mu\text{g}/\text{dL}$ per 100,000 adult employed Pennsylvanians in 2019 was 6.2. Pennsylvania has historically and continues to be among the top states for elevated BLLs among adults.

Take-home lead exposure occurs when people exposed to lead at work unintentionally bring lead into their homes, frequently on their clothing. Children, as well as women who are pregnant or are planning to become pregnant, are at greater risk for lead poisoning.

Recommendations

For healthcare providers:

- When talking with a patient, take a detailed medical history, asking about an individual's current and previous occupation, hygiene habits, hobbies, and other non-occupational sources, etc.
- Be aware of the multiple sources of lead exposure, both occupational and non-occupational
- If patients are being exposed to occupational or non-occupational sources, educate them on take-home lead exposure
- Review the below recommendations on ways to reduce lead exposure, as well as other current guidelines and trainings. Advise patients accordingly on best practices
- Review the symptoms that are associated with lead toxicity
- After receiving results of a patient's BLL test, follow up with the patient to discuss the results and report results to the PA DOH when ≥ 5 $\mu\text{g}/\text{dL}$. Even if the BLL is low, no level of lead is safe. Inform the patient of the negative health consequences of lead exposure.
- Review recent literature on lead toxicity in adults
 - [Lead toxicity: a review - PMC \(nih.gov\)](#)
 - [A systematic review of clinical and laboratory findings of lead poisoning: lessons from case reports - ScienceDirect](#)
 - [Low-level lead exposure and mortality in US adults: a population-based cohort study - ScienceDirect](#)

- [Associations among Heavy Metals and Proteinuria and Chronic Kidney Disease | HTML \(mdpi.com\)](#)
- [Occupational and Environmental Exposure to Lead and Reproductive Health Impairment: An Overview - PMC \(nih.gov\)](#)

For the general public to reduce personal and take-home lead exposure:

- If working in an occupation where the risk of lead exposure is high
 - Wash hands often, especially before eating, drinking, smoking, or leaving the workplace
 - Only eat or drink in a designated clean space when at work
 - Use the appropriate personal protective equipment (PPE) when working with lead, such as gloves and respirators. Ensure that respirators fit properly
 - Clean the car that is used to travel to and from work, as lead dust may accumulate there
 - Remove lead contaminated clothes and shoes at work and change into clean clothes before returning home
- If exposed to lead by non-occupational sources
 - Wash hands often when participating in hobbies where lead exposure is high, such as hunting, fishing, and home renovation.
 - Wear PPE when appropriate
 - If living in an older home, consider getting paint (before 1978) and water (before 1986) tested for lead. Leaded paint can be removed by professionals and will reduce lead dust in the home. Leaded pipes can be replaced with alternative materials, such as polyvinyl chloride (PVC) pipes, to reduce lead contamination in drinking water
 - If consuming imported spices or candies, or using imported cosmetics or cookware, contact the PA Department of Agriculture, the Consumer Product Safety Commission, or your local health department to have your product tested. If the product contains lead, stop using the product immediately.
- If you suspect that you may have been exposed to lead, or a family member has been exposed to take-home lead, contact a medical provider for a blood lead test and follow-up.

Additional resources on adult lead exposure

- [Lead \(pa.gov\)](#)
 - [Occupational Lead Exposure Fact Sheet](#)
 - [Spanish Translation - Occupational Lead Exposure Fact Sheet](#)
 - [Non-Occupational Lead Exposure Fact Sheet](#)
 - [Spanish Translation - Non-Occupational Lead Exposure Fact Sheet](#)
- [Adult Blood Lead Epidemiology and Surveillance \(ABLES\) | NIOSH | CDC](#)
- [Lead - Overview | Occupational Safety and Health Administration \(osha.gov\)](#)
- For additional questions regarding lead exposure in adult Pennsylvanians, contact dehe@pa.gov

Categories of Health Alert messages:

Health Alert: conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: provides important information for a specific incident or situation; may not require immediate action.

Health Update: provides updated information regarding an incident or situation; unlikely to require immediate action.

This information is current as of October 6, 2022, but may be modified in the future.
