

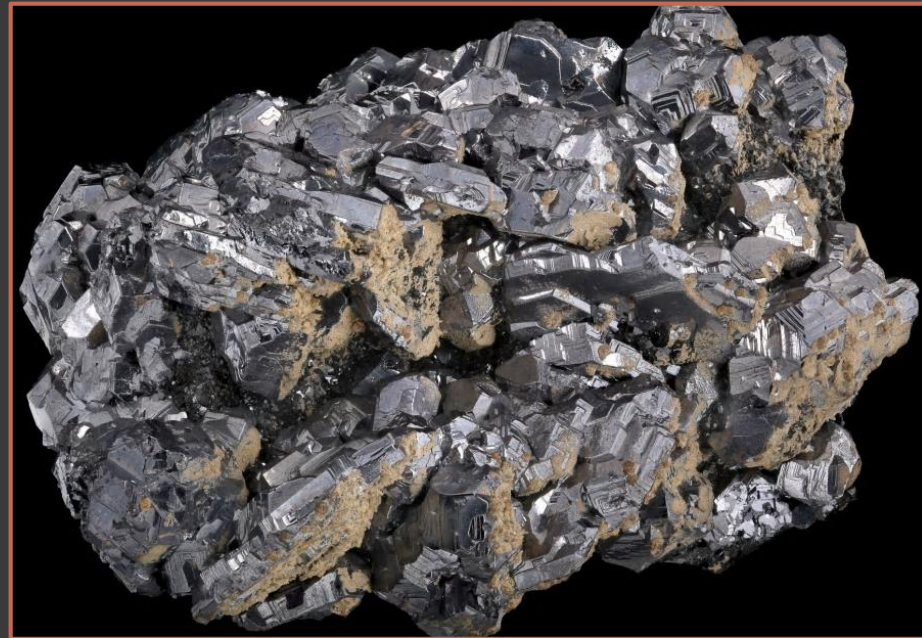
# LEAD AND ITS HEALTH EFFECTS IN CHILDREN

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# WHAT IS LEAD?

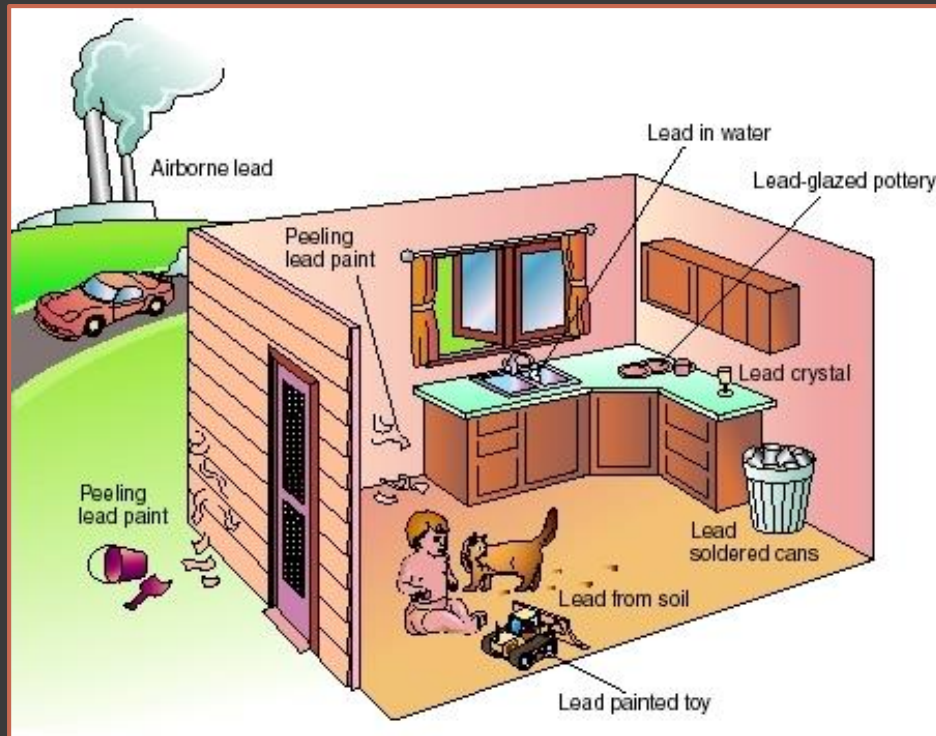
- ❖ Naturally occurring in ground
- ❖ Highly toxic poison
- ❖ Causes health problems
- ❖ Unable to see or smell when used in products

Bluish-gray Metal



Ferro, Shaunacy. 10 Facts About the Element Lead, 30 Jan. 2019.  
<https://www.mentalfloss.com/article/571125/element-lead-facts>

# WHERE IS LEAD FOUND?



## Throughout the Environment

- ❖ Paint
- ❖ Dust
- ❖ Soil
- ❖ Air
- ❖ Lead pipes
- ❖ Some imported items

Encyclopedia of Children's Health Forum. *Lead Poisoning*, n.d. <http://www.healthofchildren.com/L/Lead-Poisoning.html>

# LEAD EXPOSURE

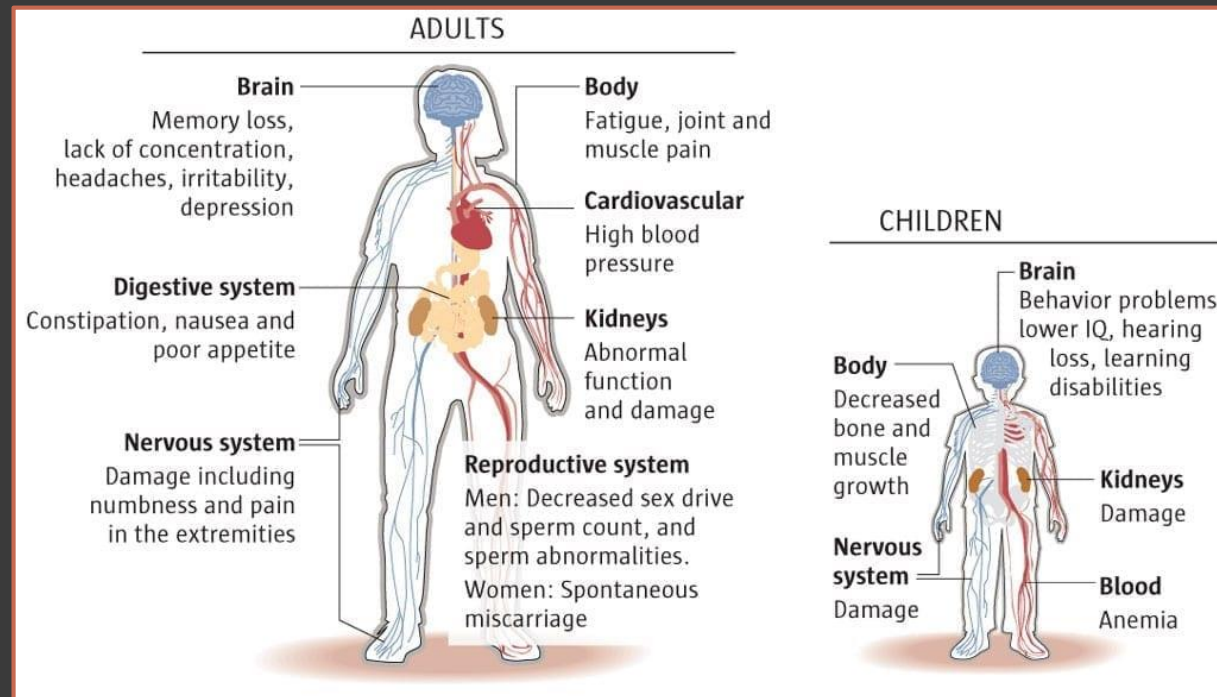
## Children and Adults

- ❖ Occupations or hobbies
  - ❖ Mining
  - ❖ Welding
  - ❖ Construction
  - ❖ Manufacturing
  - ❖ Stained glass
  - ❖ Bullet

Belleza, RN, Marianne. *Lead Poisoning*, 11 Jun. 2018. <https://nurseslabs.com/lead-poisoning/>



# LEAD POISONING



## No Safe Level

- ❖ Toxicity rare after single exposure
- ❖ Usually builds slowly over time in body

Rodriguez, Steve. Bulldog Professional Inspection Services, LLC. *Get the Lead Out – Lead in Older Homes*, 15 Oct. 2015. <https://bulldoginspect.com/lead-dangers-older-homes/>

# RISK FACTORS AND WHEN TO TEST

## Test Based on Risk Factors or Insurance Requirements

- ❖ Ages 1 and 2
- ❖ Ages 3-6
- ❖ Pregnant women
- ❖ Foreign-born children

ISDH. *Lead & Healthy Homes Division Brochure*, 5 Mar. 2018.  
<https://www.in.gov/isdh/files/March%202018%20Lead%20Brochure%20Final.pdf>

### Is your family at risk?

- Does your child live in or visit a house or child care center built before 1978?
- Does your child have a sibling or playmate who has an elevated blood lead level?
- Is your child enrolled in Hoosier Healthwise (Medicaid)?
- Does your child frequently come in contact with a person who works or has a hobby in a high risk industry, such as a battery factory, smelter, stained glass, fishing or reloading ammunition?
- Is your child a recent immigrant from a country where the use of lead in consumer products or traditional remedies such as Arzacon or Greta is not restricted?
- Have you exposed your child to cosmetics containing kohl?

**If you answered YES to any question, have your child screened for lead.**

# TESTING

## Tests Blood Lead Level (BLL)



❖ Venous

❖ Detects current or past exposure

ISDH. *Blood Lead Specimen Collection and Shipping Guidance*, 10 Feb. 2016. <https://www.in.gov/isdh/files/Blood%20Lead%20Specimen%20Collection%20Guide%20v%203%2012%202016.pdf>



❖ Capillary

# MEDICAL AND CASE MANAGEMENT

Blood Lead Levels (BLL)	Recommended Medical and Case Management Actions							
	Confirmatory Blood Lead Test (A)	Hospitalization	Chelation Therapy (B)	Blood Lead Level Retest	Referrals (C)	History and Physical (D)	Elevated BLL Education (E)	Reducing Exposure and Absorption (F)
0-9.9 µg/dL	No	No	No	within 6 months if BLL ≥ 5 µg/dL	No	No	YES	YES
10-19.9 µg/dL	within 3 months, venous or capillary	No	No	see Retest Chart below	YES	YES	YES	YES
20-44.9 µg/dL	within 1 month, venous or capillary							
45-59.9 µg/dL	within 48 hours, venous or capillary	No, if home is lead-safe	YES	see Retest Chart below	YES	YES	YES	YES
60-69.9 µg/dL	within 24 hours, venous or capillary							
≥ 70 µg/dL	Immediate emergency lab test, venous only	YES <b>MEDICAL EMERGENCY</b>	YES	see Retest Chart below	YES	YES	YES	YES

**THERE IS NO SAFE LEVEL OF LEAD— DAMAGE CAUSED BY AN ELEVATED BLOOD LEAD LEVEL IS PERMANENT AND IRREVERSIBLE!**

## Explanation of Recommended Medical and Case Management Actions

- (A) **Confirmatory blood lead test:** 2 consecutive capillary blood lead tests, not more than 12 weeks apart, OR, single venous blood lead test
- (B) **Chelation Therapy:** if chelation therapy is indicated, the child should be immediately removed from the hazardous environment until the child's environment is made lead-safe; however, if the home is already lead-safe, the child may remain in the home unless hospitalization is indicated
- (C) **Referrals:** contact local health department and/or LHHP to assist in case management and environmental investigations
- (D) **History and physical:** take medical, environmental, and nutritional histories; test for anemia and iron deficiency; assess neurological, psychosocial, and language development; screen all siblings under age 7; evaluate risk of other family members, especially pregnant/lactating women
- (E) **EBLL (Elevated Blood Lead Level) education:** discuss sources, effects of lead, and hazards associated with living in/or renovating a pre-1978 home, during prenatal care and well child care at 3, 6, and 12 months; explain what blood lead levels mean; contact LHHP for materials
- (F) **Reducing exposure and absorption:** discuss damp cleaning to remove lead dust on surfaces; eliminating access to deteriorating lead paint surfaces, and ensuring regular meals which are low in fat and rich in calcium and iron; contact LHHP for materials

## Continue Follow-up Medical Treatment and Case Management

### Retest Chart

Use this chart to determine when to retest children who are *confirmed with elevated blood lead levels*. Venous testing is **strongly preferred**, but capillary testing is acceptable.

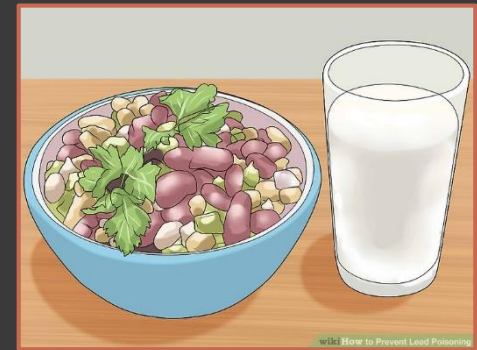
If the child's last <u>confirmed</u> BLL was...	Test the child again within...
0-9.9 µg/dL	6 months
10-24.9 µg/dL	3 months
25-44.9 µg/dL	1 month
≥ 45 µg/dL	1 month after chelation therapy, venous method only

ISDH. *Lead Screening Requirements and Medical Management Recommendations*, 7 Feb. 2018.  
<https://www.in.gov/isdh/files/Medical%20Management%20Physician%20Chart%20Feb72018.pdf>



# PREVENTION

Lead Poisoning is 100% Preventable



Marusinec, MD, Laura. WikiHow. *How to Prevent Lead Poisoning*, 5 Apr. 2019. <https://www.wikihow.health/Prevent-Lead-Poisoning>

# RESOURCES

Cafasso, Jacquelyn. "Lead Poisoning." *Healthline.com*, 21 Jun. 2016. <https://www.healthline.com/health/lead-poisoning>. Accessed 15 Nov. 2018.

Centers for Disease Control and Prevention. "Childhood Lead Poisoning Prevention." *CDC.gov*, 18 Dec. 2019. <https://www.cdc.gov/nceh/lead/default.htm>. Accessed 9 Jan. 2020.

Indiana State Department of Health. "Lead." *ISDH.IN.gov*, n.d. <https://www.in.gov/isdh/18884.htm>. Accessed 9 Jan. 2020.

Mayo Clinic. "Lead Poisoning." *MayoClinic.org*, 20 Dec. 2019. <https://www.mayoclinic.org/diseases-conditions/lead-poisoning/symptoms-causes/syc-20354717>. Accessed 9 Jan. 2020.

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U.S. Department of Housing and Urban Development. "About Lead-Based Paint." *HUD.gov*, n.d. [https://www.hud.gov/program\\_offices/healthy\\_homes/healthyhomes/lead](https://www.hud.gov/program_offices/healthy_homes/healthyhomes/lead). Accessed 15 Nov. 2018.

United States Environmental Protection Agency. "Learn About Lead." *EPA.gov*, 20 Aug. 2018. <https://www.epa.gov/lead/learn-about-lead>. Accessed 15 Nov. 2018.