

CLINICAL MANAGEMENT OF LEAD EXPOSURE IN PREGNANT AND BREASTFEEDING WOMEN

Modified from CDC 2010 Recommendations¹

- There is no safe lead level (BLL).
- Lead crosses the placenta and transfers to breast milk.
- Prenatal and early childhood lead exposure impairs neurodevelopment.
- Assesses for risk factors and screen for lead exposure at prenatal visits.

Adverse health effects of prenatal lead exposure

- Impaired fetal neurodevelopment.
- Increased risk for gestational hypertension.
- Possible association between BLL, spontaneous abortion, preterm deliveries.

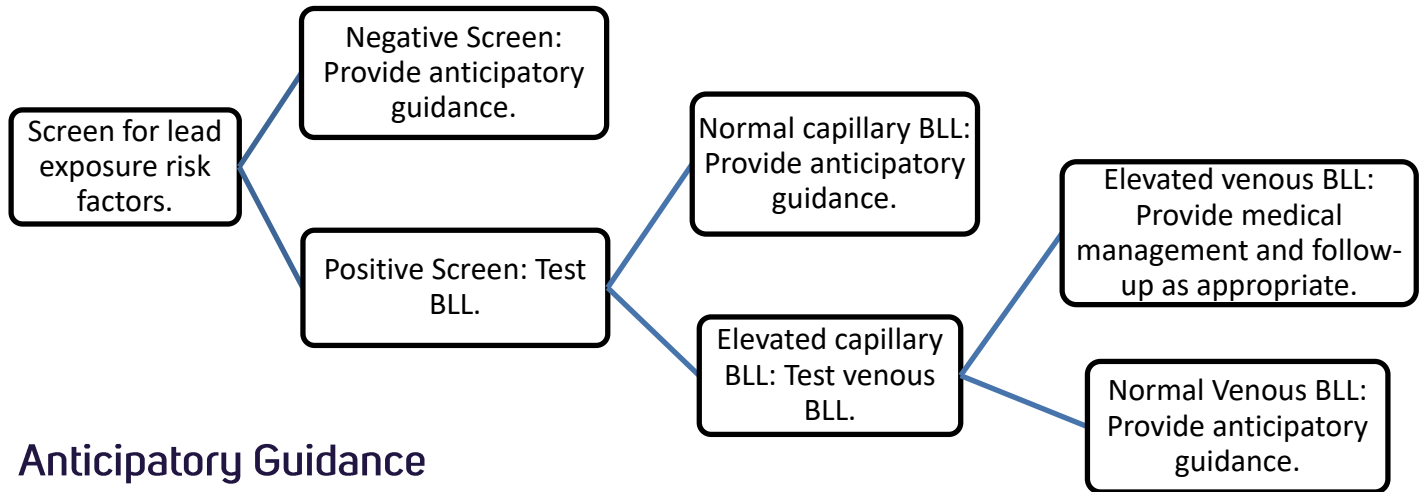
Risk factors for lead exposure

- Living near a point source
- Occupational exposure
- Lead-glazed ceramic pottery
- Pica – eating nonfood substances
- Alternative therapies w/ lead
- Imported products like cosmetics
- Recreational activities using lead
- Renovating/remodeling pre-1978 homes
- Contaminated drinking water
- History of previous lead exposure
- Living w/ someone with an elevated BLL

Screening: Health-care providers should use a blood lead test to screen pregnant women if they answer “yes” or “don’t know” to any of the following questions.

- Were you born, or have you spent any time living, outside of the United States?
- Do you live in a home that was built before 1978? If so, in the last 12 months, has there been any renovation or repair work in your home or apartment building?
- To your knowledge, has your home drinking water been tested for lead and if so, were you told that the level was high? Screen as positive only if answer is “yes.”
- During the past 12 months, did you use any imported health remedies (like traditional folk remedies), spices, foods, ceramics, or cosmetics?
- Sometimes pregnant women have the urge to eat things that are not food, such as clay, soil, plaster, or paint chips. During your pregnancy did you ever eat, chew on or mouth nonfood items—even accidentally?
- Have you ever had a job or hobby that involved possible lead exposure, such as home renovation or working with glass, ceramics, or jewelry?
- Do you or others in your household have an occupation or hobby that involves lead exposure?

Figure 1: Screening Algorithm for Prenatal Lead Exposure



Anticipatory Guidance

- Never eat or mouth nonfood items, such as clay, soil, pottery, or paint chips, because they may be contaminated with lead.
- Avoid jobs or hobbies that may involve lead exposure, and take precautions to avoid take-home lead dust if a household member works with lead. Such work includes construction or home renovation/repair in pre-1978 homes, and lead battery manufacturing or recycling.
- Avoid using imported lead-glazed ceramic pottery produced in cottage industries and pewter or brass containers or utensils to cook, serve, or store food.
- Avoid using leaded crystal to serve or store beverages.
- Do not use dishes that are chipped or cracked.
- Stay away from repair, repainting, renovation, and remodeling work being done in homes built before 1978 in order to avoid possible exposure to lead-contaminated dust from old lead-based paint. Avoid exposure to deteriorated lead-based paint in older homes.
- Avoid alternative cosmetics, food additives, and medicines imported internationally that may contain lead, such as azarcon, kohl, kajal, surma, and many others.
- Use caution when consuming candies, spices, and other foods that have been brought into the country by travelers from abroad, especially if they appear to be noncommercial products of unknown safety.
- Eat a balanced diet with adequate intakes of iron and calcium, and avoid the use of cigarettes and alcohol.

Nutrition in the context of lead exposure in mothers

- Optimize nutrition, balanced diet, prenatal vitamins.
- If BLL ≥ 5 $\mu\text{g}/\text{dL}$ prescribe dietary intake of Ca^+ 2000 mg/day.
- Iron status evaluation – treat anemia accordingly.
- Proper nutrition assistance programs (i.e. SNAP) for those in need.

Medical Management of Lead Exposure during Pregnancy

BLLs \geq 5-14 $\mu\text{g}/\text{dL}$

- Consider notifying local Health Department if $\text{BLL} > 10$; reportability of elevated adult BLLs varies by state.
- Remove exposure and refer to Occupational Medicine.
- Repeat venous BLL within 1 month and obtain cord BLL at delivery.
- Infant's physician should be informed of mother's lead exposure and BLL at delivery and should provide on-going monitoring for child.

BLLs \geq 15-44 $\mu\text{g}/\text{dL}$,

ALL OF THE ABOVE, PLUS:

- Encourage environmental risk assessment by health department with case management.
- Repeat venous BLL within 1-4 weeks and then every 2-3 months, or if $25 < \text{BLL}$, repeat monthly.

BLLs \geq 45 $\mu\text{g}/\text{dL}$,

ALL OF THE ABOVE, PLUS:

- Consult with an expert in lead poisoning and chelation (chelation also warranted in cases of life-threatening lead encephalopathy).
- Treat as high-risk pregnancy.
- Repeat BLL within 24 hours and then at frequent intervals.

Medical Management of Lead Exposure during Breastfeeding

Initial Venous BLL ($\mu\text{g}/\text{dL}$)	Follow up blood lead test(s)
5 – 9	Every 3 months, per guidelines for adult blood lead testing (Appendix VI), unless infant BLLs are rising or fail to decline
20 – 39	2 weeks postpartum and then at 1- to 3-month intervals depending on direction and magnitude of trend in infant BLLs
\geq 40	Within 24 hours postpartum and then at frequent intervals depending on clinical interventions and trend in BLLs Avoid breastfeeding until mother's BLL $<$ 40 $\mu\text{g}/\text{dL}$ Consultation with a clinician experienced in the management of lead poisoning is advised.

¹Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women. CDC, 2010.

<http://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf>.

For additional questions or guidance, contact the NW PEHSU. The University of Washington based Pediatric Environmental Health Specialty Unit (PEHSU) serves medical and public health professionals in Alaska, Washington, Idaho, and Oregon. For more information contact us at 1-877-KID-CHEM or pehsu@uw.edu or visit our website <http://www.deohs.washington.edu/pehsu>.

Acknowledgment: E. Friedman MD, MPH. S. Sathyanarayana, MD, MPH. C. Karr, MD, PhD; December 2017.

This material was supported by the American College of Medical Toxicology (ACMT) and funded (in part) by the cooperative agreement FAIN: U61TS000238-04 from the Agency for Toxic Substances and Disease Registry (ATSDR).

Acknowledgement: The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing partial funding to ATSDR under Inter-Agency Agreement number DW-75-95877701-4. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications

