Department of Health

Identification and Management of Lead Exposure in Pregnant and Lactating Women and their Infants Receiving Breastmilk

Lead is dangerous for a developing fetus, and it can be found in the blood and bones of pregnant women who have been exposed to lead hazards. Both mother and infant can be harmed by lead. This guidance document was developed to assist medical providers in identifying and minimizing potential lead exposure risks for pregnant and lactating women and their infants receiving breastmilk.

1. Primary prevention of childhood lead exposure begins before birth.

2. All pregnant women should be screened for lead exposure using the *Prenatal Risk Assessment for Lead* and given guidance and education about risk reduction.

3. **Routine blood lead testing of all pregnant women is not recommended.**

4. Blood lead testing of pregnant women with identified risk factors for lead exposure is recommended for one or more affirmative answers for questions 1-7 on the *Prenatal Risk Assessment for Lead.* In Ohio, these are the main risk factors:

   A. Occupations or hobbies that have the potential for lead exposure (see *Prenatal Risk Assessment for Lead*).

   B. Children in the household with lead exposure.

   C. Personal history of lead exposure.

   D. Remodeled or renovated a home built before 1978 in the past five years.

   E. Has eaten non-food items during the pregnancy (pica behavior).

   F. The pregnant woman was either born or has spent time recently outside of the United States.

5. The *Prenatal Risk Assessment for Lead* is useful in identifying specific areas of potential lead exposure for risk reduction counseling and education.

6. Considerations for blood lead testing:

   A. A venous sample should be drawn as early in pregnancy as possible.
   B. The Centers for Disease Control and Prevention (CDC) uses a blood lead reference value of 3.5 micrograms per deciliter (µg/dL) to identify children with higher levels of lead in their blood compared to most children. This level is based on the 97.5th percentile of the blood lead values among U.S. children ages 1-5 years from the 2015-2016 and 2017-2018 National Health and Nutrition Examination Survey (NHANES) cycles. Children with blood lead levels

at or above the BLRV represent those at the top 2.5th percentile with the highest blood lead levels. ODH uses this same level to define the level of concern in pregnancy.

C. Maternal blood lead level results should be conveyed to the pediatric healthcare provider when practicable.
D. The sensitivity of maternal blood lead level analysis is ±2 µg/dL or 10 percent (whichever is greater)

7. Management and follow up of elevated maternal blood lead levels (BLL) (See tables 1 and 2 on pages 4 and 5).

A. Provide guidance on lead risk reduction and health education materials.
B. Attempt to determine source(s) of lead exposure and counsel patient on reduction strategies.
    a. Refer to the Ohio Department of Health's Lead Poisoning Prevention Program by calling 1-877-LEAD-SAFE.
C. Assess nutritional adequacy (all pregnant women should have an individualized dietary assessment)
    a. Eat frequent and regular meals. Environmental lead is more easily absorbed on an empty stomach.
    b. Increase the amount of iron and calcium consumed.
        i. Iron (30 mg elemental daily; patients with anemia 60-120 mg daily)-fortified breads and cereals, cooked legumes (dried beans/peas), spinach, lean red meat.
        ii. Calcium (2,000 mg daily)-either through diet (milk, yogurt, cheese, cooked greens, calcium fortified orange juice), supplement, or a combination of the two.
D. Follow-up blood lead testing (See Table 1 on page 4).
E. Any BLL 3.5 µg/dL or above requires action and follow up (See Table 2 on page 5).
F. Any children less than age 6 in the household should receive a lead test.
G. Maternal and umbilical cord blood lead levels should be measured at delivery.

8. Breastfeeding.

A. Measurement of levels of lead in breast milk is not recommended.
B. **Initiation of breastfeeding should be encouraged for mothers with BLLs <40 µg/dl**.
C. At BLLs between 3.5-39 µg/dL, breastfeeding should be initiated. At maternal blood lead levels 3.5 µg/dL to less than 20 ug/dL, infant blood lead levels should be drawn to establish a baseline. If above 20 ug/dL, breastfeeding should be accompanied by sequential infant BLLs to monitor trends. If infant BLLs are rising or failing to decline by 5 µg/dL, the

pediatric health care provider should contact the Ohio Lead Poisoning Prevention Program. If no external source of lead exposure is identified and maternal BLLs are greater than or equal to 20 µg/dL AND infant BLLs are greater than or equal to 3.5 µg/dL, then breast milk may be the source of lead exposure. Mothers should consult with their medical provider about temporarily pumping and discarding their breast milk until maternal BLLs are lower.

D. A woman with a BLL greater than or equal to 40 µg/dL should not initiate breastfeeding.
    a. She may pump and discard her breast milk until her level declines to <40 µg/dl.

References

Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women (https://stacks.cdc.gov/view/cdc/147837) and Centers for Disease Control and Prevention "Risk Factors and Pregnancy" (https://www.cdc.gov/lead-prevention/risk-factors/pregnancy.html)

Lead Screening During Pregnancy and Lactation. Committee Opinion No. 533. American College of Obstetricians and Gynecologists. Obstet Gynecol 2012; 120:416-20 (Reaffirmed in 2023). https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2012/08/lead-screening-during-pregnancy-and-lactation

U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services. (2020). Final rule: Clinical Laboratory Improvement Amendments of 1988 (CLIA) proficiency testing—Analytes and acceptable performance (CMS-3355-F). Federal Register, 85(17), 4672–4715. https://www.federalregister.gov/d/2020-01630

Table 1: Follow-up Blood Lead Testing During Pregnancy

Venous[a] Blood Lead Level (micrograms/dL)	Performance of follow-up test(s)
< 3.5 µg/dL	None needed.
3.5-14 µg/dL	Within one month. Obtain maternal BLL[b] or cord BLL at delivery.
15-24 µg/dL	Within one month and then every two to three months. Obtain maternal BLL[b] or cord BLL at delivery. More frequent testing may be indicated based on risk factor history.
25-44 µg/dL	Within one to four weeks and then every month. Obtain maternal BLL[b] or cord BLL at delivery.
> 45 µg/dL	Within 24 hours and then at frequent intervals depending on clinical interventions and trend in BLLs. Consultation with a clinician experienced in the management of pregnant women with BLLs in this range is strongly advised (Call Poison Control at-800-222-1222). Obtain a maternal BLL or cord BLL at delivery.

a. Venous blood sample is recommended for maternal blood lead testing.
b. If possible, obtain a maternal BLL as early in pregnancy as possible.

Table 2: Management of Elevated Maternal Blood Lead Levels

BLL	Healthcare Providers	Ohio Lead Poisoning Prevention Program
< 3.5 µg/dL	• Provide lead exposure and risk reduction health education materials to all pregnant and lactating women.	• Collects all blood lead test results on all Ohio residents.
3.5-9 µg/dL	Above actions plus • Attempt to determine source(s) of lead exposure and counsel patients on strategies to reduce exposure. • For occupationally exposed women, review proper use of personal protective equipment and consider contacting employer. • Assess nutritional adequacy. • Follow-up testing.	As above.
10-44 µg/dL	Above actions plus • Recommend removal from exposure.	Above actions plus • Contacts patient when notified and sends out health education materials to patient. • Recommends removal from exposure. For 15-44 µg/dL, above actions plus. • If an occupational exposure is identified, refers worksite for investigation to appropriate occupational health organizations.
> 45[a] µg/dL	Above actions plus • Treat as high-risk pregnancy (consider consultation with a maternal-fetal medicine specialist). • Consider in-patient chelation in consultation with a lead poisoning expert. (Call Poison Control at 1-800-222-1222)	Above actions plus • Facilitates consultation with an identified lead poisoning expert experienced in man aging chelation in pregnant women.

Blood lead levels ≥ 70 µg/dL may result in significant maternal toxicity; therefore, chelation should be considered regardless of trimester of pregnancy and in consultation with an identified lead poisoning expert.