Oregon Lead Poisoning Prevention Program
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DHS Oregon Department of Human Services

Lead Screening Protocols for Children

The goal of lead screening is to identify children who have been exposed to lead, provide appropriate interventions and reduce the risk of exposure. If an elevated blood lead level (EBLL) is detected, the nature of care and the frequency of follow-up testing vary with the patient's age and the blood lead level (BLL). Whatever the age, people with EBLLs (or their parents) should be educated about what lead poisoning is and what they can do about it. The single most important factor in managing childhood lead poisoning is identifying and reducing the child's exposure to lead. For more guidance on caring for children with elevated levels see the document, "Medical Evaluation and Recommendations for Children with EBLLs."

Anticipatory Guidance

Recent research has shown that there is no safe level of lead exposure and levels below the public health action level (10 µg/dL) can cause permanent problems with learning, memory and behavior.[1] Therefore, anticipatory guidance regarding lead hazard identification and risk reduction measures should be a routine part of an ongoing educational approach for pregnant women, children and their families. Health Care Providers should provide source identification and risk reduction educational materials.

Lead exposure during pregnancy is especially problematic as lead can cross the placenta and interfere with normal development of the fetal brain. Pregnant women can be exposed to lead through a variety of sources. Pregnant or women likely to become pregnant should try to maintain lead levels below 10 µg/dL and as low as possible. Anticipatory guidance should focus on decreasing the risk of exposure to lead by advising against activities such as remodeling or repainting the baby's room or restoring old furniture. Women exposed to lead occupationally may need special counseling.

Testing Methods

Blood lead testing is the only acceptable laboratory test for screening and confirming lead poisoning. Venipuncture is preferred for specimen collection, but capillary testing is acceptable if care is taken to properly clean and prepare the finger. Capillary samples are easier to contaminate because of the possibility of lead containing dust and dirt on the hand or under the fingernails. All capillary BLLs of 10 µg/dL or higher must be followed with a confirmatory venous test. The higher the capillary screening BLL, the more urgent the need for a venous confirmatory test. The schedule for confirmatory testing of a child with an EBLL is in table 3. Several tests have been found to be insensitive and/or imprecise as **screening** tests for lead, and are not recommended. These include: erythrocyte protoporphyrin (EP), zinc protoporphyrin (ZPP) basophilic stippling, urine testing, and assays of hair or fingernail lead levels.

Oregon Lead Risk Assessment Questionnaire

All children should be assessed for risk of lead poisoning by administration of the Oregon Lead Risk Assessment Questionnaire (see below). This questionnaire should be administrated at 1 and 2 years of age and between 3 and 5 years of age if not previously screened. If the answer to any of the following question is "Yes" or "Don't know" a blood lead test should be performed. Follow-up questions may be needed to clarify responses. The questionnaire is available in different formats and languages.

1. Has your child lived in or regularly visited a home, child care or other building built before 1950?
2. Has your child lived in or regularly visited a home, child care or other building built before 1978 with recent or ongoing painting, repair and/or remodeling?
3. Is your child enrolled in or attending a Head Start program?
4. Does your child have a brother, sister, other relative, housemate or playmate with lead poisoning?
5. Does your child spend time with anyone that has a job or hobby where they may work with lead?

   Examples: painting, remodeling, auto radiators, batteries, auto repair, soldering, making sinkers, bullets, stained glass, pottery, going to shooting ranges, hunting or fishing.
6. Do you have pottery or ceramics made in other countries or lead crystal or pewter that are used for cooking, storing or serving food or drink?
7. Has your child ever taken any traditional home remedies or used imported cosmetics?

   Examples: Azarcon, Alarcon, Greta, Rueda, Pay-loo-ah, or Kohl
8. Has your child been adopted from, lived in or visited another country?
9. Do you have concerns about your child's development or behavior?

Diagnostic Blood Lead Testing

Blood lead testing should also be considered as part of a diagnostic work-up of any child regardless of age with the following symptoms:

- **Behavioral problems:** aggression, hyperactivity, attention deficit, school problems, learning disabilities, excessive mouthing or pica behavior and other behavior disorders.
- **Developmental problems**: growth, speech and language delays and/or hearing loss.
- **Symptoms or signs consistent with lead poisoning:** irritability, headaches, vomiting, seizures or other neurological symptoms, anemia, loss of appetite, abdominal pain and cramping or constipation.
- **Ingestion of foreign body.**

Confirmatory Testing Schedule

Any capillary screening BLL above 10 µg /dL must be confirmed with a venous sample. The higher the BLL on the capillary test, the more urgent the need for confirmatory testing. The table below outlines the confirmatory venous schedule based on the initial screening result.

If result of capillary test (µg /dL) is:	Perform confirmatory test on venous blood within:
Level of Concern 5-9	Confirmatory blood lead test recommended. Caregiver should discuss with their medical provider.
Public Health Action Level 10-19	30 days
20-44	7 days
45-59	2 days
60-69	1 day
≥ 70	Immediately as an emergency lab test

Exception to confirmatory testing schedule: If recent known exposure (e.g. foreign body ingestion, recent remodeling, etc.) confirm as soon as possible for all blood lead levels.

[1] Canfield RL, Henderson CR Jr, Cory-Slechta DA, Cox C, Juske TA, Lanphear BP. Intellectual Impairment in children with blood lead concentrations below 10 µg /dL. New England Journal of Medicine 2003;348:1517-1526.