Chapter 16: Investigation And Treatment Of Dwellings That House Children With Elevated Blood Lead Levels

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Chapter 16: Investigation And Treatment Of Dwellings That House Children With Elevated Blood Lead Levels

How to Do It

1. **Identify children with "elevated blood lead levels" (EBL) and, in particular, those children with blood levels considered by applicable statutes or regulations as "environmental intervention blood lead levels" (EIBLL).**

   - **EBL**: Develop a mechanism whereby children under age 6 years with blood lead levels (BLLs) at or above the Centers for Disease Control and Prevention's (CDC's) "blood lead reference value" for children under age 6 years are identified. As of the publication of this edition of these *Guidelines*, this reference value is 5.0 micrograms of lead per deciliter of blood (5.0 µg/dL), taken from a venous sample (i.e., from a vein) with the testing result having been verified by confirmatory testing. A child's BLL can be determined through local health departments, local childhood lead-poisoning prevention programs, or other health care providers. If the child's BLL is above the reference value, refer the findings to the child's parents or guardians. Coordinate with the child's parents or guardians and the appropriate public health, environmental, and housing agencies to avoid duplication of efforts and to determine how the investigation (inspection) should best be conducted.

   - **EIBLL**: Where a statute or regulation (such as HUD's Lead Safe Housing Rule (LSHR) as of the publication of this edition of these *Guidelines*) requires action at higher BLLs than EBL, develop a mechanism whereby such children are identified. In particular, under the LSHR, the mechanism should ensure that children under age 6 years with an environmental intervention blood lead level (EIBLL), that is, with a confirmed venous blood lead level at or above 20 µg/dL in a single test, or at 15-19 µg/dL in two tests taken at least three months apart, are identified. Blood lead levels can be determined through local health departments, local childhood lead-poisoning prevention programs, or other health care providers. If the child's BLL is an EIBLL, refer the findings to the child's parents or guardians. (If the child's BLL is at or above 45 µg/dL, the referral should note that CDC states that the response includes evaluation and treatment requiring chelation.) If the child is living in publicly owned or subsidized housing, also refer the findings to the housing agency or other housing assistance provider, and ensure that further medical treatment or case management is undertaken by the responsible authorities. Coordinate with the child's parents or guardians and the appropriate public health, environmental, and housing agencies to avoid duplication of efforts and to determine how the investigation (inspection) should best be conducted.

2. **Review any assessments.** Review the findings of any risk assessment or reevaluation (Chapter 5) or lead-based paint inspection (Chapter 7) that has already been completed for the property. The protocols in Chapters 5 and 7 usually are not sufficient for use in dwellings with a lead-poisoned child because additional environmental testing and interviewing are often required.

3. **Interview family of the child with an EBL.** Conduct a comprehensive interview based on the CDC checklist (Table 16.2) or use the questionnaire in this chapter (Form 16.1 at the end of the chapter) or an equivalent questionnaire. If a clear lead hazard is identified, correct the hazard within the applicable regulatory or guidance timeframe. If necessary, conduct environmental sampling to confirm the presence of the hazard.

4. **Conduct a full risk assessment.** Whether or not a clear lead hazard is identified, conduct a full risk assessment of the child's dwelling and of any other dwelling or space (e.g., child care center) in which the child spends a significant amount of time, because the identified lead hazard may not be the only one to which the child is exposed. Follow the guidance in Chapter 5 as augmented by the protocol in this chapter. In consultation with the child's case manager, determine what, if any, other possible sources of exposure should be investigated, including:

   - First-flush drinking water.
   - Glazed pottery or tableware that may contain lead glazes.
   - Work clothes or vehicle that may have been contaminated from a parent's or guardian's work place.
   - Imported cosmetics, hobbies, and folk remedies.

5. **When lead hazard control measures are conducted, relocate child with EBL.** In cases where lead hazard control measures are ordered, relocate the child to a lead-safe environment until the work is completed and clearance is achieved, and coordinate follow-up with the local health department and child's case manager. Prior to the remedial lead hazard control work, ensure that temporary lead hazard control measures, including cleaning, are taken immediately to protect the child living in the dwelling unit.

6. **Conduct clearance examination.** Use the guidance in Chapter 15.

7. **Permit reoccupancy when property is cleared.** Permit re-occupancy when results of clearance testing are acceptable, that is, when the work passes clearance (see Chapter 15).

8. **Provide copies of assessment to caseworker and family.** Copies of the augmented assessment results should be provided to the case manager and to the family of the child with EBL. A copy of the environmental assessment and clearance testing results should be provided to the owner of any rental property. Include recommendations to minimize exposures in the future – e.g. diet, frequent hand and toy washing, frequent floor cleaning, avoidance of cosmetics and other products that have high lead levels, etc.

I. Introduction

This chapter provides a method for investigating the possible causes of lead poisoning for an individual child under age 6 years. Although lead-based paint and lead-contaminated dust and soil are the causes of most lead exposure in American children, another lead source may be the principal cause for a specific instance of lead poisoning or contribute to the blood lead elevation (secondary source). The methods and descriptions contained in this chapter are consistent with those recommended by the Centers for Disease Control and Prevention (CDC) (CDC, 2002) with modifications to reflect the early evolution of the recommendations based on the 2012 CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in *"Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention"* (CDC, 2012a); available at ***http://www.cdc.gov/nceh/lead/ACCLPP/CDC_Response_Lead_Exposure_Recs.pdf***. The Advisory Committee's report itself (CDC ACCLPP, 2012) is available at the Recommendations of the Advisory Committee for Childhood Lead Poisoning Prevention link, ***http://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf***, on the CDC's Advisory Committee On Childhood Lead Poisoning Prevention (ACCLPP) page, ***http://www.cdc.gov/nceh/lead/ACCLPP/acclpp_main.htm***.

Because CDC, HUD, and other agencies are expected to continue to develop guidance, outreach documents and other materials pertaining to identifying and responding to children with EBL, the CDC's Lead website (***http://www.cdc.gov/nceh/lead/***), the HUD lead and healthy homes website (***http://www.hud.gov/offices/lead***), and the lead websites of additional federal and applicable state, tribal and local agencies, should be checked regularly for updates.

As of the publication of this edition of these *Guidelines*, HUD's Lead Safe Housing Rule (LSHR, 24 CFR part 35, subparts B through R), requires specific actions in certain pre-1978 ("target") housing receiving federal assistance when a child living there is found to have an environmental intervention blood lead level (EIBLL), that is, a blood lead level at or above 20 µg/dL in a single test, or at 15-19 µg/dL in two tests taken at least three months apart (24 CFR 35.110). The actions to be taken are specified in the Rule in its subparts, which are organized around the types of housing assistance:

Subpart D, Project-Based Assistance Provided by a Federal Agency Other Than HUD;

Subpart G, Multi-family Mortgage Insurance;

Subpart H, Project-Based Rental Assistance;

Subpart L, Public Housing Programs; and

Subpart M, Tenant-Based Rental Assistance (also known as the housing choice voucher program).

The LSHR is at HUD's Lead-Safe Housing Rule web page, ***http://www.hud.gov/offices/lead/enforcement/lshr.cfm***, with a link to HUD's Interpretive Guidance about the rule, which is posted at ***http://portal.hud.gov/hudportal/documents/huddoc?id=DOC_25476.pdf***. See Appendix 6 for more information about the LSHR.

The protocol in this chapter is different from the risk assessment protocol in Chapter 5 of these *Guidelines*. That protocol is meant for use in dwellings regardless of a resident child's blood lead level, as a "primary prevention" measure. Primary prevention is the process of preventing lead hazards from occurring and, when they do occur, controlling lead hazards to prevent exposure before a child is poisoned. The protocol in this chapter is intended for use as part of "secondary prevention," the process of identifying children who have elevated blood lead levels, and controlling or eliminating the sources of further exposure. In particular, secondary prevention involves medical and environmental follow-up services for individual children with an EBL. However, many of the basic procedures and sampling methods are similar between primary and secondary prevention. The investigations of dwellings that house children with EBLs differ from ordinary risk assessments in the following three important ways:

1. The purpose of the investigation is to identify lead hazards in the environment of a child. A ordinary risk assessment attempts to uncover lead-based paint hazards in a dwelling, regardless of whether a child has an EBL.

2. The investigator is obligated to conduct a comprehensive investigation of all sources of lead in the child's environment, not just those lead exposures directly related to the child's residence. This investigation includes studying less-common sources of lead, such as glazed pottery and folk medicines or remedies, etc., and other dwellings or areas frequented by the child. Some of these sources may be discovered by the results of the questionnaire.

3. The investigator tests deteriorated paint on furniture identified as a potential hazard to the environmental intervention blood lead (EIBLL) child, regardless of who owns the furniture.

FIGURE 16.1 **Health Department case managers work with parents and guardians of lead-poisoned children.**

Many activities described in this chapter are generally performed by State or local health departments and childhood lead poisoning prevention programs, which bear the principal responsibility for responding to individual cases (see Figure 16.1).

However, situations may occur when State or local public health authorities, or parents or guardians hire private risk assessors or investigators to investigate the dwelling of a child with an elevated blood lead level. Some of these agencies can only respond to the children with blood lead levels higher than the EBL threshold, for any of several reasons, leaving cases of children below their action threshold for others to investigate. In addition, some jurisdictions may not have programs available to investigate children with EBL. Medicaid and other third-party payers may reimburse expenses for investigations performed by certified, private-sector investigators.

Investigators who gather the information needed to characterize possible hazards in dwellings that house children with EBL should possess good interviewing techniques as well as proficiency in risk assessment and environmental sampling techniques.

Private individuals who respond to lead poisoned children should always coordinate their activities with local authorities, including public health case managers, public health environmental investigators, housing agencies, and health care providers to prevent unnecessary duplication of effort and to acquire information on sources of lead poisoning that may be significant in a specific locale or culture. In some instances, risk assessments or lead-based paint inspections may have already been completed. Before eliminating paint or dust as the cause of the poisoning, the investigator should carefully review any previous reports to assess the quality of the previous investigations and to ensure that dust test results are a reflection of the current exposure.

Investigators are sometimes asked to explain the meaning of a particular blood lead level. For a specific child, this interpretation is best left to the child's pediatric health care provider or public health case manager. States and local health departments may also provide the basic information to parents or guardians.

II. Management of Lead Hazards in the Environment of Individual Children

The investigation of lead poisoned children is a complex issue requiring teamwork. Three governmental entities are most likely involved: public health, environmental health, and housing agencies.

A. Public Health Case Management

Public health case management consists of coordinating, providing, and overseeing services to reduce children's blood lead levels below the CDC blood lead reverence level (as of the publication of this edition of these *Guidelines,* 5.0 µg/dL), and to control or eliminate lead hazards in the child's environment. Case managers are trained public health professionals, including public health nurses, social workers, and public health investigators. Case management includes ensuring prompt and effective environmental management, monitoring medical care, providing education to the family, and coordinating any needed services following an individual plan of care.

Medical follow-up includes repeated blood lead level testing, development assessment, and iron therapy and chelation treatment as indicated. CDC's scheduling recommendations include schedules for obtaining a confirmatory venous sample, and for follow-up blood lead testing (CDC ACCLPP, 2012, tables 2 and 3, respectively).

Families should be educated about lead poisoning, including the meaning of the child's blood lead level and the potential effects of lead on their child, the medical and environmental follow-up planned, how to reduce risks, and how to help their child get well. Environmental investigation and intervention are essential. Some families will need extensive case management and referral to social service providers. The public health case manager is the primary point of contact between the childhood lead poisoning prevention program and the family.

B. Environmental Investigation and Intervention

Environmental investigation and intervention for children with EBL are usually overseen by agencies and programs with legal responsibility for the protection of human health in the dwelling environment, typically local and State health departments. Responsibilities may be shared by public health, environmental, and housing agencies. Public health or environmental agencies may have the responsibility, technical equipment, and expertise for the investigation, but housing agencies may have to enforce the codes or laws. For children with EBL, both a thorough environmental investigation of all possible sources of lead exposure for the individual child and intervention are needed to protect the child from further exposure and harm. Lead-based paint or the lead-contaminated dust and soil may or may not be the main source of the child's exposure to lead. The risk assessor should talk with the public health authorities and improve the communication with the family in order to collect accurate information about the child's exposure, and to ensure the success of any needed intervention.

The environmental investigation should be performed during a visit to the child's current dwelling unit and other sites where the child spends a significant amount of time (e.g., child care center or grandparent's home).

Information about year of construction should be obtained from tax assessor records or other city housing records. The parents or guardians should be questioned regarding all possible lead sources and risk factors. CDC developed guidelines for questioning parents or guardians (see Table 16.2). A detailed questionnaire is set forth in Form 16.1 for use by investigators. Information on child or family member behavioral risk factors, including hand to mouth or toy-to mouth activity, pica (abnormal appetite or craving of non-nutritive substances or non-food items), or parents' or guardians' occupation and the determination that such behaviors are affecting a child's blood lead level is best left to a medical health care provider. If the child has recently moved, the child's blood lead level may reflect exposure to lead hazards at the previous residence. When primary and other locations are identified (such as present and previous dwelling unit and/or child care center, whether in a commercial building or in a home), all of the locations should be investigated. Testing a previous residence or a child care center has the additional benefit that it may also identify lead hazards that could harm other young children currently living in that dwelling.

FIGURE 16.2 **Environmental investigations include sites where the child spends time.**

If assessment of additional dwelling units or a child care center/dwelling is required, the investigator should make the necessary arrangements for assessment and possible testing at these locations after consultation with the child's case manager or local health department (see Figure 16.2).

Testing should include the following at a minimum: house dust, paint/coatings that are not intact or subject to friction, and bare soil, especially in play areas. Testing of drinking water should be done only if: the community drinking water is known to be at risk; the family's home is served by a private well; history suggests contamination; or no other sources of lead can be found. Public health authorities can provide this information.

Where the questionnaire results indicate that the child may have been exposed to other sources of lead, including toys, children's jewelry, folk or "home" remedies, imported cosmetics, candy or candy wrappers (the Consumer Product Safety Commission has information on many such consumer products, see ***http://www.cpsc.gov***), or each parent's or guardian's occupation and hobbies, additional environmental testing may be required. The environmental investigator should consult with the child's case manager or local health department about sampling to identify whether lead hazards are present. Once the assessment of all possible sources of lead exposure has been completed, the most probable source(s) of the child's poisoning can be identified and remedial actions to eliminate further lead exposure of the child can be recommended. The investigator should identify the likely sources of lead exposure to the child's family during the investigation. The investigator should always recommend temporary measures to immediately reduce the child's exposure to lead hazards including a thorough cleaning of the dwelling unit and the placement of temporary barriers over areas with peeling, chipping paint (see Chapter 11). Where probable sources of poisoning are not related to a building (e.g., use of ceramics or folk remedies), follow-up should be referred to the public health team.

The results of the investigation should be released only to parents or guardians, and appropriate government authorities. Confidential information about the child or family should not be revealed to any other individual without the informed consent of the child's parents or guardians. Information concerning building and site hazards, and options for control of those hazards should be reported to both the owner and/or occupant.

If legal action is necessary, public health authorities should determine (based on Federal, State and local law) the nature and extent of requirements for the property. In some cases, the appropriate response may be to help the family move the poisoned child into a lead-safe dwelling unit.

Table 16.1 Summary of Recommendations for Assessment and Remediation of Residential Lead Exposure

1. Conduct an environmental investigation for all children under age 6 years with confirmed blood lead levels greater than or equal to the CDC blood lead reference value (as of 2012, 5.0 µg/dL). This investigation should include:
    a. An inspection of the child's home and other sites where the child spends significant amounts of time.
    b. A history of the child's exposure
    c. Measurements of environmental lead levels, including at a minimum:
        i. House dust.
        ii. Paint that is not intact or is subject to friction.
        iii. Exposed soil, especially in play areas.
        iv. Other media as appropriate.
2. Ensure that interventions to reduce ongoing exposure:
    a. Focus on control of current lead hazards.
    b. Include prompt initial measures (e.g., house dust control by professional cleaners) where appropriate, to reduce lead exposure rapidly.
    c. Use lead-safe practices by trained workers to avoid increasing lead exposure to occupants and workers. If the interventions include renovation, repair or painting (RRP) work that is not covered by EPA's minor repair and maintenance exemption from the EPA's RRP Rule, the work must be conducted by a certified renovation firm using a certified renovator conducting or supervising the work, and, if used, all additional workers must be trained to work in a lead-safe manner on the job.
    d. Keep to a minimum on-site removal of intact leaded paint.
    e. Replace or enclose building components when elimination of intact leaded paint is performed.
    f. Include visual inspection and clearance testing following lead hazard reduction work to ensure that lead levels are safe prior to the dwelling being re-occupied.
    g. Include temporary occupant relocation or other measures to protect occupants from exposure to leaded dust produced by lead hazard control activities.
    h. Relocate children permanently to lead-safe housing if necessary to reduce their lead exposure in a timely manner.

Sources: CDC, 2002; adapted with regard to CDC, 2012a, and to EPA's Renovation, Repair and Painting Rule (40 CFR 745, especially subpart E).

In some situations, the investigator and public health case manager will be unable to identify sources of lead exposure. The source may be obscure; the parent or guardian may be concealing information about someone, such as a babysitter or family member, whose interests they want to protect; or the parent or guardian may fear reprisal for disclosing certain information. This situation can best be handled by establishing a good rapport with the family and convincing them that the intent is not to find the family or any individual at fault but rather to help the child get well.

During the investigation and remediation, the investigator and public health team should discuss their concerns with the family in a clear and direct manner for the well-being of the child. If exposures continue, the child will be unable to get well. The best approach is to provide clear information and to maintain contact and open communication with the family. The public health case manager will continue to coordinate follow-ups for the child and family until the case is closed.

C. State/Local Housing Intervention

With prompt and effective environmental management as their priority, public-sector health and housing agencies should take joint responsibility for coordination of the housing effort for lead-poisoned children. This follow-up effort may involve working closely with the environmental investigator to control identified lead hazards in a timely manner. Housing officials can also use their access to State and locally managed properties and programs to ensure that lead-safe, temporary housing is available for families with lead-poisoned children and to pay for emergency services if needed to rapidly reduce exposure to lead hazards and protect children. The HUD Lead-Safe Housing Rule requires owners of rental housing receiving certain types of Federal financial assistance to respond promptly when informed that a lead poisoned child lives in an assisted unit (see Section I, above). HUD also requires public housing authorities to attempt to share and match information on addresses of families receiving Federal housing assistance with local health agencies that have information on children with EIBLL (24 CFR 35.1225(f)).

III. Lead Hazard Identification

Lead hazards are identified through the administration and evaluation of a questionnaire (see Tables 16.2 and Form 16.1) and through environmental sampling. Sampling procedures are addressed in Chapters 5 and 7 and Appendices 13.1, 13.2 and 13.3. The questionnaire should always be completed prior to sampling. Although a clear lead source may emerge from the answers to the questionnaire, the investigation of exposure sources in the child's residence should be thorough and complete. Environmental testing should be linked to the child's history and may include a prior residence or other areas frequented by the child. If another residence or childcare facility is identified as a probable source of lead exposure, appropriate environmental sampling should be conducted after discussion with the child's community or local health department. Testing should include the following samples at a minimum:

- X-ray fluorescence (XRF) or laboratory paint chip analysis of all defective paint or coatings on the child's residence including furniture, play structures, and on buildings frequented by the child.
- XRF or laboratory paint chip analysis of all impact and friction surfaces and surfaces that appear to have been chewed, including windowsills.
- Dust samples from areas frequented by the child, including play areas, porches, kitchens, bedrooms, and living and dining rooms. Additional dust samples may be collected from other surfaces (e.g. shoes, boots, cars) for which there are no standards; the information may be helpful in identifying other sources of exposure.
- Soil samples from bare soil areas, particularly child play areas (areas near the foundation of the house and areas from the yard). If the child spends significant time at a park or other public play area, samples should also be collected from these areas, unless the area has already been sampled.
- Where water testing is indicated, first-drawn and flushed water samples from the tap most commonly used for drinking water, infant formula, or food preparation.
- Where applicable, other media as appropriate including glazed tableware or ceramic cookware likely to contain lead.

Table 16.2 Guidelines for Questions to Ask Regarding a Child's Environmental History

Paint and soil exposure

- What is the age and general condition of the residence?
- Is there evidence of chewed or peeling paint on woodwork, furniture, or toys?
- How long has the family lived at that residence?
- Have there been recent renovations or repairs in the house?
- Are there other sites where the child spends significant amounts of time?
- What is the character of indoor play areas?
- Do outdoor play areas contain bare soil that may be contaminated?
- How does the family attempt to control dust/dirt?

Relevant behavioral characteristics of the child

- To what degree does the child exhibit hand-to-mouth activity?
- Does the child exhibit pica?
- Are the child's hands washed before meals and snacks?

Exposures to and behaviors of household members

- What are the occupations of adult household members (Lead smelter, machining or grinding of lead alloys, battery or radiator manufacturing, home renovation/remodeling, demolition of old structures, steel bridge maintenance, welding or cutting of old painted metal, thermal stripping or sanding of old paint).
- What are the hobbies of household members? (Fishing, working with ceramics or stained glass, and hunting are examples of hobbies that involve risk for lead exposure.)
- Are painted materials or unusual materials burned in household fireplaces?

Miscellaneous questions

- Does the home contain vinyl mini-blinds made overseas and purchased before 1997?
- Does the child receive or have access to imported food, cosmetics, or folk remedies?
- Is food prepared or stored in imported pottery or metal vessels?

Managing Elevated Blood Lead Levels Among Young Children, CDC, March 2002

Table 16.3 Common Sources of Lead Exposure to Consider in an Environmental Investigation

(Less-common sources should be considered where appropriate – see Table 16.4)

Source	Standards[a]/Comments
Paint	*Existing paint in structures built prior to 1978, i.e., lead-based paint: 1 mg/cm^2 or 0.5%* *New paint: 90 ppm in dried paint film.* Hazard is increased if leaded paint is deteriorated; present on surfaces subject to friction (e.g., window sashes) or impact (e.g., door knob banging); or disturbed during maintenance, repair, and renovation, especially during surface preparation for repainting. See the note on the lead-based paint standard, below.
Interior dust	*Floors: 40 micrograms per square foot (µg/ft^2)* *Interior window sills: 250 µg/ft^2* *Window troughs: 400 µg/ft^2* See the note on these standards, below.
Soil	*Bare play area soil: 400 ppm* *All other soil: 1200 ppm* Dust on paved surfaces in urban areas often contains elevated lead concentrations.
Drinking water	*First draw from tap (stagnant sample): 15 ppb* Probability of contamination depends on the chemistry of the water. For communities served by public water systems, available data may indicate whether testing is likely to be helpful.
Jobs, hobbies	House dust may be contaminated with lead indirectly via contaminated work clothes, shoes, or hair. Direct contamination can occur from hobbies that generate lead fumes (from heating) or dust.

[a] The source of lead exposure should be controlled if the results of this sampling indicate that lead levels are equal to or greater than the limits listed below. These were the standards as of the publication of this edition of these *Guidelines*; at that time, in response to a petition received by the EPA on August 10, 2009, regarding the lead-based paint, dust-lead standards and clearance standards, EPA and HUD were reviewing those standards. (See ***http://www.epa.gov/oppt/chemtest/pubs/petitions.html#petition5*** for links to the petition and EPA's response.) Investigators should become familiar with their State and local jurisdiction standards, which may require action at a lower level. Investigators should consult the literature and the government web-sites to keep up to date with and follow the current regulations and guidance documents.

Lead-Based Paint

1.0 mg/cm^2 or 5,000 µg/g (0.5 percent).

Dust (by wipe sampling)

40 µg/ft^2 - floors
250 µg/ft^2 - windowsills

Clearance Standards

40 µg/ft^2 – interior floors.
250 µg/ft^2 – interior windowsills.
400 µg/ft^2 – window troughs [sometimes, improperly, called window wells].

Bare Residential Soil

400 ppm or µg/g in play areas
1200 ppm or µg/g in non-play areas [recommend for gardens].

Water

15 ppb, first draw, 1 L sample volume

Ceramic or Pottery Glazes

Soluble lead compounds can leach out of ceramic ware (these released compounds are called leachates) when the glaze is improperly fired or when the glaze has broken down because of wear from daily usage, particularly after repeated use in a microwave or dishwasher. Chips and cracks in ceramic ware also allow leaching of lead. When lead that is released into food and drink from ceramics, hazardous levels can contaminate food substances and expose children and adults to toxic levels. The leachate is liquid that, in passing through matter, extracts solutes, suspended solids or any other component of the material (such as lead) through which it has passed.

The U.S. Food and Drug Administration's (FDA's) compliance program guidelines on toxic elements in foodware describes FDA's approach to inspecting ceramic or pottery glazes for lead (FDA, 2003). The leachate for ceramic foodware is analyzed by graphite furnace atomic absorption spectrometry using Method 973.32 of the Association of Official Analytical Chemists (FDA, 2000b; FDA, 2005). The FDA uses the following ceramicware action levels (FDA, 2000a):

	µg/ml leaching solution
Flatware (average of 6 units)	3.0
Small hollowware (other than cups and mugs) (any 1 of 6 units)	2.0
Large hollowware (other than pitchers) (any 1 of 6 units)	1.0
Cups and mugs (any 1 of 6 units)	0.5
Pitchers (any 1 of 6 units)	0.5

IV. Lead Hazard Reduction

A. Time Limits

After reviewing the results of the questionnaire and the environmental sampling, immediate steps should be taken to remove and/or control the lead source from the dwelling unit or to relocate the child.

For public housing, certain other federally supported housing programs, and certain State and locally funded housing programs, regulations may require that all testing be completed within 15 days after an EIBLL child is identified. For example, this 15-day requirement applies to housing receiving federal assistance under programs covered by HUD's LSHR's subparts H, I, L or M (see Section I, above, for the subpart names, and see 24 CFR 35.730(a), 35.830(a), 35.1130(a), and 35.1225(a), for the respective regulatory requirements). For these HUD housing programs, interim control of all lead-based paint hazards must be completed within 30 days after receipt of the risk assessment report or the health department's evaluation (see 24 CFR 35.730(c), 35.830(c), 35.1130(c), and 35.1225(c).) See, also, Appendix 6.

Checking with the state, tribal and/or local jurisdiction is important, since they may have shorter time requirements than HUD's that will apply if the housing is receiving federal assistance, or they may have requirements that apply if the housing is not receiving federal assistance. If a child is present and the lead hazard reduction work will be delayed, short-term interventions, such as lead-safe dust removal, should be taken to rapidly reduce the child's exposure to lead hazards until the work will be conducted.

B. Modifications to Ordinary Lead-Based Paint Hazard Controls

Dwellings where extensive lead hazard control activities are occurring, particularly those that increase leaded dust levels, should achieve leaded dust clearance standards before the lead poisoned child and family reoccupy the dwelling. Children with EBL should not be permitted to reenter the dwelling at the end of the workday as indicated in Chapter 8. All children with EBL should leave the dwelling until *all* the lead hazard control work has been completed and clearance established, regardless of the size of the area to be treated. The child's family may need to be relocated temporarily to a dwelling free of lead-based paint hazards if interim controls of lead-based paint hazards are conducted (see 24 CFR 35.1345(a)(2) for the situations in which family relocation is required).

In some cases it may make sense for the family to move permanently to a lead-safe house. The owner may be required to facilitate such a move, or local government may assume some or all of the responsibility. In some cities, public housing authorities may be one source of providing lead-safe housing on an emergency basis. Local governments should consider implementing a system of prioritization to ensure that children with EBL are moved to a lead-safe dwelling as soon as possible. However, efforts to make sure that the original housing unit is made lead-safe are essential to preventing lead poisoning in other children who may move into the unit.

C. Elimination or Control of Other Lead Hazards

All lead hazards identified in the course of the investigation should be eliminated or controlled. If lead hazards not containing paint are identified, contact the appropriate agency and coordinate plans for hazard control with the local health department and the child's case manager. Drinking water is usually regulated by the local public works agency or water and sewage authority. Notify State or local environmental regulatory agencies as appropriate. If probable occupational lead hazards are identified or contaminated work clothing is being taken into the dwelling, counsel the worker regarding the possibility of take-home exposures and inform him/her of the steps needed to protect family members. Where appropriate, work with the case manager to refer adult household members for blood lead testing. If occupational exposure is suspected, inform the federal Occupational Safety and Health Administration (OSHA) or the state, tribal or local occupational safety and health agency.

In some cases, no probable source of lead may be identified. In these instances, public health authorities should reassess possible sources of exposure, with increased emphasis on folk remedies and other culturally related exposures. A list of published reports of some less common sources of lead exposure is in Table 16.4, below.

Table 16.4 Published Reports of Less Common Causes of Elevated Blood Lead Levels (EBLs) in Children

(see Appendix I in CDC, 2000)

Exposure Source	Description/Exposure Pathway	Study Type*	Study Description
Occupational Take Home Exposures			
Battery reclamation	Lead carried home by battery workers. (Only a minority of battery workers showered or changed clothes before going home.)	E	Twelve (75%) of 16 children of lead-exposed workers had EBLLs and a higher average BLL than neighborhood controls (22.4 vs. 9.8 µg/dL, *p*=.049).
Ceramics	Ceramic-coated capacitors made with fritted glass containing lead.	E	Case-control study of 51 children under 6 years (20 exposed, 31 controls) showed higher average BLLs in exposed children (13.4 vs. 7.1 µg/dL, p<.001).
Furniture refinishing	Lead carried home by workers who restored furniture that had undergone chemical stripping and was thought to be lead-free.	CR	Report of six workers and three of their children aged 4-18 months
Construction	Lead dust on skin and clothes taken home.	E	Case-control study of 50 children under 6 years (31 exposed, 19 controls) showed 25.8% of workers' children had EBLLs compared to 5.3% of control children (OR=6.1).
Radiator repair	Lead carried home by workers who did soldering to repair radiator.	E	The mean BLL for 18 children (under 7 years) of lead-exposed workers was 10 µg/dL.

Exposure Source	Description/Exposure Pathway	Study Type*	Study Description
Imported Cosmetics			
Kohl, Kajal (Middle East, India, Pakistan, some parts of Africa)	A gray or black eye cosmetic applied to the conjunctival margins of the eyes. Can contain up to 83% lead. It is believed to strengthen and protect the eyes against disease. Also known as Al Kohl.	E	A study of 538 girls aged 6 to 12 years demonstrated that the application of kohl was associated with higher BLLs (p=0.0461).
Pakistani eye cosmetics	Eye cosmetics are often applied to the eyes of children.	E	Retrospective chart review of 175 children aged 8 months to 6 years showed an average BLL of 4.3 µg/dL for Pakistani/ Indian children not using eye cosmetics and 12.9 µg/dL for those using eye cosmetics (p=0.03).
Surma (India)	A black fine powder applied to the eyes for medicinal and cosmetic reasons.	E	A case-control study of 62 children demonstrated higher BLLs in children using surma (p<.001).
Contaminated Foods			
Apple cider	Cider was made in a maple syrup evaporator that had lead solder joining the interior seams.	CR	Report of a 7-year-old child.
Flour (Middle East)	Lead fillings used in stone mills contaminated flour.	E	Investigation of 43 symptomatic patients aged zero to 80 years and their families and of 563 children aged 10 to 18 years demonstrated that 33 (23%) of 146 community stone mills had lead contamination and that 171 (30.4%) of 563 children had BLLs exceeding 30 µg/dL.
Lozeena	An orange powder used to color rice and meat that contains 7.8%-8.9% lead.	CR	Report of brothers aged 2 and 3 years and their parents. In addition, 9 of 18 extended family members had EBLLs.
Infant formula	Infant formula was made with contaminated tap water from copper pipes with lead solder.	CR	Report (with environmental sampling data) of a 13-month-old child.
Tamarind candy (Mexico)	Tamarind candy jam products from Mexico. During the manufacturing process, the candied jam is packaged in stoneware or terra cotta ceramic jars that can leach lead.	CR	Report of two children under 6 years old, six older children, and one adult.

Exposure Source	Description/Exposure Pathway	Study Type*	Study Description
Beverage Containers			
Bulk-water storage tank	Lead leached from soldered seams and brass fittings in bulk-water storage tanks.	CR	Report of three children aged 6, 12, and 14 months.
Ceramic glaze	Lead in ceramic glaze can leach into stored beverages, especially juices since they are acidic. The risk is highest for improperly fired containers.	CR	Multiple reports.
Cocktail glass	Lead leached from cocktail glass.	CR	Report of a family with one adult and children aged 4, 5, and 14 years.
Iranian urn (samovar)	Lead spot solder from the original manufacturing process leached into water used to make baby formula.	CR	Reports of a 10-week-old child with seizures and of a 4-month-old child.
Lead-soldered kettle	Lead leached into infant formulas.	CR	Reports of a 3-month-old child and of a 1-day-old child.
Folk Remedies			
Azarcon	Also known as **alarcon**, **coral**, **luiga**, **maria luisa**, or **rueda**. Bright orange powder used to treat empacho (an illness believed to be caused by something stuck in the gastrointestinal tract, resulting in diarrhea and vomiting). Azarcon is 95% lead.	E	Report of 15-month-old and 3-year-old siblings who expired with seizures and a subsequent survey of 545 systematically selected households for azarcon and greta usage.
Ayurvedic medicine (Tibet)	Unnamed folk medicine.	CR	Single case.
Ba-Baw-San (China)	Herbal medicine used to treat colic pain or to pacify young children.	E	Study of 319 children aged 1 to 7 years demonstrated that consumption was associated with increased BLLs (p=.038).
Bint Al Zahab (Iran)	Rock ground into a powder and mixed with honey and butter given to newborn babies for colic and early passage of meconium after birth.	CR	Report of six children aged 2 days to 3 months.
Bint Dahab (Saudi Arabia; means "daughter of gold")	A yellow lead oxide used by local jewelers and as a home remedy.	CR	Report of 10 children aged 7 days to 13 months, including three who took bint dahab.

Exposure Source	Description/Exposure Pathway	Study Type*	Study Description
Folk Remedies (continued)			
Bokhoor (Kuwait)	A traditional practice of burning wood and lead sulphide to produce pleasant fumes to calm infants.	CR	Report of four children aged 16 days to 4.5 months.
Ghasard	Brown powder used as a tonic to aid in digestion.	CR	Report of a 9-month-old child who died.
Greta (Mexico)	Yellow powder used to treat empacho (see **azarcon**); can be obtained through pottery suppliers, as it is also used as a glaze for low-fired ceramics. Greta is 97% lead.	E	See azarcon.
Jin Bu Huan (China)	An herbal medicine used to relieve pain.	CR	Report of three children aged 13 and 23 months and 2.5 years.
Pay-loo-ah (Vietnam)	A red powder given to children to cure fever or rash.	CR	Report of a 6-month-old child.
Po Ying Tan (China)	An herbal medicine used to treat minor ailments in children.	CR	Report of a 4-month-old child.
Santrinj (Saudi Arabia)	An amorphous red powder containing 98% lead oxide used principally as a primer for paint for metallic surfaces, but also as a home remedy for "gum boils" and "teething."	CR	Report of 10 children aged 7 days to 13 months, including 7 who took santrinj.
Surma (India)	Black powder used as a cosmetic and as teething powder.	E	A case-control study of 62 children demonstrated higher BLLs in children using surma ($p<.001$).
Tibetan herbal vitamin	Used to strengthen the brain.	CR	Report of a 5-year-old child.
Saudi folk medicine	Orange powder prescribed by a folk medicine practitioner for teething; also has an antidiarrheal effect.	CR	Report of three children aged 11, 22, and 44 months.
Miscellaneous			
Automobile key-chain emblem	Ingestion of lead-containing automobile key-chain emblem.	CR	Report of a 23-month-old child.
Clothing accessory	Ingestion of a "simulated watch."	CR	Report of 3-year-old child who required endoscopy.

Exposure Source	Description/Exposure Pathway	Study Type*	Study Description
Miscellaneous (continued)			
Curtain weights	Ingestion of lead-containing curtain weights.	CR	Report of deaths of a 23-month-old child and a 2-year-old child.
Fishing sinkers	Ingestion of a lead-containing fishing sinker.	CR	Report of an 8-year-old.
Gasoline sniffing	Lead in gasoline absorbed through gasoline sniffing.	CR	Report of six of seven siblings aged 10 to 17 years.
Lead bullet	Lead absorbed from a retained bullet.	CR	Report of one adult and review of 18 other cases including seven children under 2 years old.
Lead pellets	Ingestion of lead pellets from pellet gun.	CR	Report of a 6-year-old child.
Lead shot and toy (boat keel)	Lead shot used in a toy boat keel that was eaten by a child.	CR	Report of a 4-year-old child.
Newsprint fireplace log	Lead inhaled during burning of a log made from old newsprint.	CR	Report of a 6-month-old child.
Pool cue chalk	Lead contained in pool cue chalk.	CR	Report of two children aged 28 and 27 months.
Vinyl miniblinds	Lead dust from vinyl miniblinds.	E	A study of 92 children aged 6 to 72 months attributed 9% of lead poisoning cases to vinyl miniblind exposure.

***CR = case report, E = epidemiological study**

See, also, the CDC lead website's pages for information and links about, for example:

- Folk Medicine (***http://www.cdc.gov/nceh/lead/tips/folkmedicine.htm***), regarding lead in some traditional (folk) medicines from a variety of cultures.
- Candy (***http://www.cdc.gov/nceh/lead/tips/candy.htm***), regarding lead from candy imported from Mexico.
- Sindoor (***http://www.cdc.gov/nceh/lead/tips/sindoor.htm***), regarding lead poisoning related to ingesting sindoor, a red powder, typically used as a cosmetic and in certain religious ceremonies, but which has been used as a food additive.
- Toy jewelry (***http://www.cdc.gov/nceh/lead/tips/jewelry.htm***), regarding swallowing lead jewelry or putting it in the mouth.
- Toys (***http://www.cdc.gov/nceh/lead/tips/toys.htm***), especially regarding toys imported into the U.S., or antique toys and collectibles passed down.

- Artificial turf (***http://www.cdc.gov/nceh/lead/tips/artificialturf.htm***), of which some made of nylon or nylon/polyethylene blend fibers contain levels of lead that pose a potential public health concern when they show signs of weathering, including fibers that are abraded, faded or broken.

The CDC lead website also has pages of general interest, and particular interest when no probable source of lead may be identified, regarding At-Risk Populations (***http://www.cdc.gov/nceh/lead/tips/populations.htm***), including linked pages with information and further links on:

- International adoption and prevention of lead poisoning (***http://www.cdc.gov/nceh/lead/tips/adoption.htm***), for adopting parents, adoption agencies, and health care providers.
- Refugees (***http://www.cdc.gov/nceh/lead/tips/refugees.htm***), with a link to CDC's Lead Poisoning Prevention in Newly Arrived Refugee Children tool kit page (***http://www.cdc.gov/nceh/lead/Publications/RefugeeToolKit/Refugee_Tool_Kit.htm***) and, from there, to the tool kit itself (***http://www.cdc.gov/nceh/lead/Publications/RefugeeToolKit/pdfs/CDCRecommendations.pdf***). The webpage provides recommendations for primary prevention of EBLs, identification of children with EBLs, early post-arrival evaluation and therapy, and health education/outreach. The tool kit is divided into three sections, a refugee resettlement worker module (for state and local health departments, refugee coordinators, refugee health coordinators, and others involved with the well-being and resettlement of refugees), a medical provider module (for those involved with direct medical services to refugees) and resources (for refugee resettlement workers, medical providers and others interested in refugee issues).
- Pregnant Women (***http://www.cdc.gov/nceh/lead/tips/pregnant.htm***), with guidance for pregnant women and links to the CDC's Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women (***http://www.cdc.gov/nceh/lead/publications/LeadandPregnancy2010.pdf***) for health care providers and public health professionals, and a CDC Podcast about the guidelines (***http://www2c.cdc.gov/podcasts/player.asp?f=3467768***).

The CDC lead website has a page listing and providing links to dozens of Childhood Lead Poisoning Publications, arranged by topic:

- Data and Surveillance Reports
- Health Care Systems/Insurance Guidelines
- International Response
- Lead Exposure Case Studies
- Lead Policy Statements
- Lead Toxicology Reports
- Primary Prevention Guidelines
- Screening and Case Management Guidelines

Case management will continue until case closure, based on decline in the child's blood lead level, control of identified lead hazards, and completion of an individualized plan for follow-ups.

References

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CDC, 2012b. Centers for Disease Control and Prevention. Fact Sheet: Blood Lead Levels in Children – Important Information for Parents. May 2012. ***http://www.cdc.gov/nceh/lead/ACCLPP/Lead_Levels_in_Children_Fact_Sheet.pdf***

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FDA, 2005. U.S. Food and Drug Administration, Office of Regulatory Affairs. ORA Laboratory Manual, Volume IV, Section 6-Elemental Analysis. See ***http://www.fda.gov/ora/science_ref/lm/vol4/section/06.pdf***

Form 16.1 Resident Questionnaire for Investigation of Children with Elevated Blood Lead Levels (EBL)

General Information

1. Where do you think the child is exposed to the hazard?_____

2. Do you rent or own your home? ❑ rent ❑ own
   If rented, are there any rent subsidies? ❑ yes ❑ no
   If yes, what type: ❑ Public housing authority ❑ Section 8 _____ ❑ Federal Rent Subsidy
   ❑ Other (specify) _____
   _____

Landlord information (or Rent Collector Agent)

Name: _____

Address: _____ Phone: _____

3. When did you/your family move into this home? (month/year)_____

Complete the following for all addresses where the child has lived during the past 12 months, including this home.

Dates of Residency	Address Include City and State	Approximate Year Built	General Condition of Dwelling: Any renovation or deteriorated paint?

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (2 of 9)

4. Is the child cared for away from the home? (This includes preschool and/or child care at a center, dedicated home, or with a friend or relative.)

   If yes, complete the following table.

Type of Care	Location of care Contact name, address and phone	No. hours/wk at location	General Condition of Dwelling: Any renovation or deteriorated paint?

Lead-Based Paint and Lead-Contaminated Dust Hazards

1. Has this dwelling been tested for lead-based paint or lead-contaminated dust? ❑ yes ❑ no
   If yes, when?_____ Where can this information be obtained? _____

3. Approximately what year was the dwelling built? _____
   a. If unknown, was it before 1950? ❑ yes ❑ no

3. Has there been any recent repainting, remodeling, renovation, window replacement, sanding or scraping of painted surfaces inside or outside this dwelling unit? If yes, describe activities, time and duration of work.

   _____
   _____
   _____
   _____

4. Has any lead abatement or other lead hazard control work been conducted at this dwelling recently?
   ❑ yes ❑ no

5. Where does the child like to play, hide, or frequent? (Include rooms, closets, porches & outbuildings)

   _____

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (3 of 9)

Use the table below.

Areas where the child likes to play, hide, or frequent	Paint condition* (intact, not intact, or not present)	Location of painted component with visible bite marks

** Paint condition: Note location and extent of any visible chips and/or dust in window wells, on window sills, or on the floor directly beneath windows. If you see peeling, chipping, chalking, flaking, or deteriorated paint, make sure you include the locations and extend of deterioration.*

Assessment - Probable: ❑ lead-based paint hazard ❑ lead-dust hazard ❑ no lead hazard

Actions:

❑ Obtain records of previous environmental testing noted above.

❑ XRF inspection of dwelling (check one) ❑ limited ❑ complete

❑ Paint testing of deteriorated paint: add to Form 5.3.

❑ Leaded dust sampling of home: add additional areas to Form 5.4 list of rooms to be sampled

❑ Other sampling (specify): _____

Water Lead Hazards

Determine whether the dwelling is located in a jurisdiction known to have lead in drinking water in either public municipal or well water. Consult with state/local public health authorities for details.

Check one: ❑ at risk ❑ not at risk

1. What is the source of drinking water for the family? ❑ Municipal water ❑ Private well
   ❑ Other (specify): _____

(This information will be used to help determine responsibility and methods of controlling lead exposures from water.)

If tap water is used for drinking, answer questions 2 through 6. If not, go to Lead in Soil Hazards.

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (4 of 9)

2. From which faucets do you obtain drinking water? (Sample the main drinking water faucet.)

   _____

3. Do you use the water immediately? ❑ yes ❑ no
   Do you let the water run for a while first? ❑ yes ❑ no

   (If water-lead levels are elevated in the first draw, but low in the flushed sample, recommend flushing the water if it has not been used for more than 6 hours before drinking.)

4. Is tap water used to prepare infant formula, powdered, milk, or juices for the children? ❑ yes ❑ no
   If yes, do you use hot or cold tap water? ❑ hot ❑ cold

   If no, from what source do you obtain water for the children?_____

5. Has new plumbing been installed within the last 5 years? ❑ yes ❑ no
   If yes, identify location(s). _____

   Did you do any of this work yourself? ❑ yes ❑ no
   If yes, specify. _____

Assessment: ❑ water lead hazard risk ❑ no water lead hazard risk

Actions:

❑ Test water (first draw and flush samples).

❑ Other testing (specify): _____

_____

❑ Counsel family (specify): _____

_____

Lead in Soil Hazards

Use the following information to determine where soil samples should be collected.

1. Where outside does the child like to play? _____
2. Where outside does the child like to hide? _____
3. Is this dwelling near a lead-producing industry (such as a battery plant, smelter, radiator repair shop, boat keel manufacturer, electronics plant, or soldering plant)? ❑ yes ❑ no
4. Is the dwelling located within two blocks of a major roadway, freeway, elevated highway, or other transportation structure? ❑ yes ❑ no
5. Are buildings or structures on the property or nearby being renovated, repainted, or demolished: ❑ yes ❑ no
   If no: Has any of this kind of work been done recently: ❑ yes ❑ no
6. Is there deteriorated paint on outside fences, garages, play structures, railings, building siding, windows, trims, or mailboxes: ❑ yes ❑ no

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (5 of 9)

7. Were gasoline or other solvents ever used to clean parts or disposed of at the property: ❑ yes ❑ no
8. Are there any visible paint chips near the perimeter of the house, fences, garages, or play structures? ❑ yes ❑ no
   If yes, note location(s). _____
   _____
9. Has soil ever been tested for lead: ❑ yes ❑ no
   If yes, when and where can this information be obtained? _____
10. Have you burned painted wood in a woodstove or fireplace? ❑ yes ❑ no
    If yes, have you emptied ashes onto soil? ❑ yes ❑ no
    If yes, where? _____

Assessment: ❑ probable soil lead hazard ❑ no soil lead hazard risk

Actions:

- ❑ Test soil (single samples of bare soil where children play). Complete Form 5.5 for Field Sampling.
- ❑ Advise family to obtain washable doormats for entrances to the dwelling
- ❑ Counsel family to keep children away from bare soil areas thought to be at risk (specify).
- ❑ Counsel family to cover bare soil areas with mulch or other material.
- ❑ Counsel family to remove the cause of lead contamination.

Additional Notes:

_____
_____
_____

Occupational and Hobby Lead Hazards

Use the information in this section to determine if the child may be exposed to lead due to the work environment or hobby of parents, siblings, or other adults. Occupations that may cause exposure include:

Paint removal (e.g., sandblasting, scraping, sanding, abrasive blasting, using heat guns or torches)	Remodeling, repairing, or renovating dwellings or buildings, or demolition (tearing down buildings or metal structures like bridges)
Chemical Strippers	Working at a firing range
Plumbing	Making batteries
Repairing radiators	Making paint or pigments
Melting metal for reuse (smelting)	Painting
Welding, burning, cutting or torch work	Salvaging metal or batteries
Pouring molten metals (foundries)	Making or splicing cable or wire
Auto body repair work	Creating explosives or ammunition
Making or repairing jewelry	Making pottery
Building, repairing or painting ships	Working in a chemical plant, glass factory, oil refinery, or any other work involving lead
Soldering electrical connections	

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (6 of 9)

Answer the following questions.

1. Where does anyone in the household and any frequent visitors work? (Include parents, older siblings, and other adults)

Name	Place of Employment	Occupation	Probable Exposure
			❑ yes ❑ no
			❑ yes ❑ no
			❑ yes ❑ no
			❑ yes ❑ no
			❑ yes ❑ no

2. Are work clothes separated from other laundry? ❑ yes ❑ no

3. Has anyone in the household removed paint or varnish while in the dwelling? (This includes paint removal from woodwork, furniture, cars, bicycles, boats, etc.) ❑ yes ❑ no

4. Has anyone in the household soldered electric parts while at home? ❑ yes ❑ no

5. Does anyone in the household apply glaze to ceramic or pottery objects? ❑ yes ❑ no

6. Does anyone in the household work with stained glass? ❑ yes ❑ no

7. Does anyone in the household use artist's paints to paint pictures or jewelry? ❑ yes ❑ no

8. Does anyone in the household reload bullets, target shoot, or hunt? ❑ yes ❑ no

9. Does anyone in the household melt to make bullets, fishing sinkers, or toys? ❑ yes ❑ no

10. Does anyone in the household work on auto body repair at home or in the yard: ❑ yes ❑ no

11. Is there evidence of take-home work exposures or hobby exposures in the dwelling? ❑ yes ❑ no

Assessment Probable:

❑ occupational related lead exposure ❑ hobby related lead exposure ❑ neither

Actions:

❑ Counsel family (specify) _____

❑ Refer to (specify): _____

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (7 of 9)

Child Behavior Risk Factors (Evaluate each child under age 6.)

1. Does the child suck his/her fingers? ❑ yes ❑ no

2. Does child put painted objects in the mouth? ❑ yes ❑ no

   If yes, specify:_____
   _____

3. Does child chew on painted surfaces, such as old painted cribs, windowsills, furniture edges, railings, door molding, or broom handles? ❑ yes ❑ no

   If yes, specify:_____
   _____

4. Does the child chew on putty around windows? ❑ yes ❑ no

5. Does the child put soft metal objects in the mouth? ❑ yes ❑ no
   These may include lead and pewter toys and toy soldiers, jewelry, gunshot, bullets, beads, fishing sinkers, or items containing solder (e.g., electronics).

6. Does the child chew or eat paint chips or pick at painted surfaces? ❑ yes ❑ no

7. Is the paint intact in the child's play areas? ❑ yes ❑ no

8. Does the child put foreign, printed material (newspapers, magazines) in the mouth? ❑ yes ❑ no

9. Does the child put matches in the mouth? (may contain lead acetate) ❑ yes ❑ no

10. Does the child play with cosmetics, hair preparations, or talcum power or put them in the mouth? ❑ yes ❑ no If yes, are any of these products foreign made? ❑ yes ❑ no

11. Does the child have a favorite: cup? ❑ yes ❑ no eating utensil? ❑ yes ❑ no
    If yes, are either of them handmade or ceramic? ❑ yes ❑ no

12. Does the child have a dog, cat, or other pet that could track in contaminated soil or dust from outside?

    ❑ yes ❑ no If yes, where does the pet sleep? _____

13. Where does the child obtain drinking water? _____

14. If a child is present, note the extent of hand-to-mouth behavior observed. _____

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (8 of 9)

Assessment if Child is at Risk:

- ❑ Hand-to-mouth behavior
- ❑ Mouthing probable lead-containing source
- ❑ Other behavior (specify) _____
- ❑ No observed at-risk behavior

Actions:

Counsel family to limit access to use of (specify) _____

Other (specify) _____

Other Household Risk Factors

1. Are imported cosmetics, such as Kohl™, Surma™, or Ceruse™, used in the home? ❑ yes ❑ no
2. Does the family ever use any home remedies or herbal treatments? ❑ yes ❑ no
   If yes, what type? _____
3. Are any liquids stored in metal, pewter, or crystal containers? ❑ yes ❑ no
4. What containers are used to prepare, serve, and store the child's food? _____
   _____
   Are any of the imported potteries, metal, soldered, or glazed? ❑ yes ❑ no
   Does the family cook with a ceramic bean pot? ❑ yes ❑ no
5. Does the family use imported canned items regularly? ❑ yes ❑ no
6. Does the child play in, live in, or have access to any areas where the following materials are kept: shellacs, lacquers, driers, coloring pigments, epoxy resins, pipe sealants, putty, dyes, industrial crayons or markers, paints, pesticides, fungicides, gear oil, detergents, old batteries, battery casings, fishing sinkers, lead pellets, solder, or drapery weights? ❑ yes ❑ no
7. Does the child take baths in an old bathtub with deteriorated or nonexistent glazing? ❑ yes ❑ no
8. Does the home contain vinyl mini-blinds made overseas and/or purchased before 1997?
   ❑ yes ❑ no

Assessment if Child is at Risk:

- ❑ Increased risk of lead exposure due to: _____
- ❑ No observed risk

Actions:

- ❑ Counsel family to limit access or use (specify): _____
- ❑ Other (specify) _____

Form 16.1 Resident Questionnaire for Investigation of Children with EBL (9 of 9)

Assessment for Likely Success of Temporary Hazard Control Measures

1. What cleaning equipment does the family have in the dwelling?
   ❑ broom ❑ mop & bucket ❑ vacuum that works ❑ sponge & rags
2. How often does the family:
   Sweep the floors? _____ Wet mop the floors? _____
   Vacuum the floors? _____ Wash the windowsills? _____
   Wash the window troughs? _____
3. What type of floor coverings are found in the dwelling? (check all that apply)
   ❑ vinyl/linoleum ❑ carpeting ❑ wood ❑ other (specify): _____
4. Are floor coverings smooth and cleanable? ❑ yes ❑ no
5. Cleanliness of dwelling (check one using table below)
   ❑ appears clean ❑ some evidence of housecleaning ❑ no evidence of housecleaning

Appears Clean	Some evidence of housecleaning	No evidence of housecleaning
No visible dust on most surfaces	Slight dust buildup in corners	Heavy dust buildup in corners
Evidence of recent vacuuming	Slight dust buildup on furniture	Heavy dust buildup on furniture
No matted or soiled carpeting	Slightly matted and/or soiled carpeting	Matted and/or soiled carpeting
No debris or food scattered about	Some debris or food scattered about	Debris or food scattered about
Few visible cobwebs	Some visible cobwebs	Visible cobwebs
Clean kitchen floor	Slightly soiled kitchen floor	Heavily soiled kitchen floor
Clean door jambs	Slightly soiled door jambs	Heavily soiled door jambs

Assessment if Child is at Risk:

- ❑ Cleaning equipment inadequate
- ❑ Cleaning routine inadequate
- ❑ Floor coverings inadequate to maintain clean environment
- ❑ No observed risk

Actions:

- ❑ Counsel family to limit access or use (specify room and location): _____
  _____
- ❑ Provide cleaning equipment
- ❑ Instruct family on special cleaning methods
- ❑ Demonstrate special cleaning methods
- ❑ Flooring treatments needed (specify rooms) _____
  _____
- ❑ Other (specify) _____