

MISSISSIPPI STATE DEPARTMENT OF HEALTH
Childhood Lead Poisoning
Case Management Plan



Mississippi Lead Poisoning Case Management Plan

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I. Introduction and Purpose

The Mississippi Childhood Lead Poisoning Prevention **Case Management Plan** was developed to support the efforts of the United States Public Health Service (Healthy People 2010) to eliminate childhood lead poisoning in Mississippi. Lead poisoning prevention guidelines for children were developed following the Centers for Disease Control and Prevention (CDC) recommendations. Many professionals are involved in the effort to identify and to intervene in childhood lead poisoning. The Childhood Lead Poisoning Prevention Advisory Board was established to provide comprehensive input into this strategic planning process.

The purpose of a detailed case management plan is to guide Health Department, Community Health Center staff and physicians in the evaluation and treatment of children with elevated blood lead levels (EBLLs).

II. Case Management Process

A. Centers for Disease Control and Prevention Recommendations for Case Management

“Case management of children with EBLLs involves coordinating, providing, and overseeing the services required to reduce their blood lead levels (BLLs) below the level of concern (i.e. 10 µg/dL). It is based on the efforts of an organized team that includes the child’s caregivers. A hallmark of effective case management is ongoing communication with the caregivers and other service providers, and a cooperative approach to solving any problems that may arise during efforts to decrease the child’s BLL and eliminate lead hazards in the child’s environment. Case management is not simply referring a child to other service providers, contacting caregivers by telephone, or other minimal activities.”⁽³⁾

Ninety percent of programs use professionals (nurses or social workers) to deliver case management services. The case manager is usually a member of the local health department staff, although nearly half of all states also use other providers to deliver case management services. In most cases, a management team can best meet the needs of an individual child. The team may include the case manager, the child’s caregiver, the child’s primary care provider (PCP), an environmental inspector, a health educator, a nutritionist, and the local public health agency.

B. Mississippi State Department of Health Case Management Recommendations

The Mississippi State Department of Health (MSDH) will provide recommendations for follow-up BLL testing, coordination of services, nutrition consultation and environmental investigation per protocol. Interventions may be adapted for special circumstances. BLLs $\geq 10\mu\text{g/dL}$ must be reported to the MSDH Childhood Lead Poisoning Prevention Program (CLPPP) within one week of diagnosis (Class 2). Laboratories are required to report all blood lead test results within one week of completion (Class 3).

In Mississippi, the case management process begins when a child has a confirmed venous BLL $\geq 10\mu\text{g/dL}$. The laboratory notifies the CLPPP Program Manager of the result. CLPPP personnel then contact the child's provider to offer case management guidance.

Time Frames for Intervention and Other Case Management Activities According to a Child's Blood Lead Level.

Blood lead level $\mu\text{g/dL}$	Actions	Time frame for beginning intervention
10-14	Provide caregiver lead education. Provide follow-up testing. Refer the child for social services if necessary.	Within 30 days
15-19	Above actions, plus: If BLLs persist (i.e., 2 venous BLLs in this range at least 3 months apart) or increase, proceed according to actions for BLLs 20-44.	Within 2 weeks
20-44	Above actions, plus: Provide coordination of care (case management). Provide clinical evaluation and care. Provide environmental investigation and control current lead hazards.	Within 1 week
45-70	Above actions.	Within 48 hours
70 or higher	Above actions, plus hospitalize child for chelation therapy immediately.	Within 24 hours

http://www.cdc.gov/nceh/lead/casemanagement/caseManage_chap2.htm#Table%202.2.
CDC, March 2002 ⁽³⁾

III. Assessments

The Case Management Plan includes Environmental, Medical, Nutritional, Developmental and Educational Assessments and Intervention protocols.

1) Environmental Assessment

An environmental assessment is performed for children whose BLLs are persistently 15-19 $\mu\text{g}/\text{dL}$ (two venous samples three months apart) or $\geq 20\mu\text{g}/\text{dL}$. The assessment consists of a surface by surface investigation to determine the source of exposure. The child's primary residence and any place the child spends at least six hours a week should be evaluated by the environmentalist.

Although there is currently no city, state, or local ordinances that require removal of lead-based paint (LBP), Congress passed the Residential Lead-Based Paint Hazard Reduction Act of 1992, also known as Title X, to protect families from exposure to lead from paint, dust, and soil. HUD and EPA require the disclosure of known information on LBP and LBP hazards before the sale or lease of most housing built before 1978. If a home owner chooses to address these LBP hazards, **anyone** making the repairs must be certified in Lead Safe Work Practices (LSWP).

Based on the environmental investigation if lead is present, parents/guardians are urged to:

- Use a wet mop at least twice a week to clean the hard surface floors.
- Replace carpet if possible with vinyl or ceramic tiles.
- Hose down outside porches often.
- Keep children's hands clean.

The environmental investigator will also give the parents valuable information on ways to maintain a lead safe home.

Sources of Lead Poisoning:

- A. House (interior) dust
- B. Paint that is not intact or is subject to friction (i.e. window sills)
- C. Exposed soil, especially in play areas
- D. Tap water
- E. Other media as appropriate (i.e. toys)



2) Medical Assessment

Most children with elevated blood lead levels are asymptomatic or some may exhibit symptoms such as follows:

- **Mild Toxicity-**

Myalgia or paresthesia, occasional abdominal discomfort, mild fatigue, irritability, lethargy

- **Moderate Toxicity-**

General fatigue, arthralgia, difficulty concentrating, muscular exhaustibility, tremors, headache, diffuse abdominal pain, vomiting, weight loss, constipation, behavioral changes, developmental delays

- **Acute Lead Encephalopathy–**

Coma, seizures, bizarre behavior, ataxia, apathy, poor coordination, vomiting, alteration in the state of consciousness, subtle loss of recently acquired skills

A. History

Detailed history is obtained including:

- Presence or absence of clinical symptoms, decrease in play activity, lethargy, anorexia, sporadic vomiting, intermittent abdominal pain and constipation. With a blood lead level $<45 \mu\text{g/dL}$, other causes of the symptoms should be sought.
- Document child's mouthing activities and existence of pica.
- Nutritional status (encourage high iron and calcium, low-fat) and dietary habits
- Previous blood lead measurements
- Developmental history/loss of milestones
- Other children in household with EBLs
- Potential sources of lead exposure (as noted on questionnaire)
- Occupational history of adults in the household
- Environmental and occupational histories of adults in other places where the child spends at least 6 hours a week (i.e. daycare or grandparent's residence)

B. Physical Exam

Physical examination should be performed with careful attention given to psychosocial and language development. Neurological examination and prompt referral for any cognitive, speech/language, neurobehavioral or other developmental abnormalities should be made. First Steps Early Intervention Program (FSEIP) can assist with these referrals up to age three or transitioning into the school system. Older children may be referred to the Child Development Clinic at University Mississippi Medical Center (UMMC), Department of Pediatrics or other developmental specialists as indicated.

C. Therapy

Chelation therapy should be performed in a tertiary care center for children in consultation with a toxicologist or other physician who has experience with chelating agents.

3. Nutritional (Dietary) Assessment

MSDH Nutrition Protocol

Lead toxicity interferes with many metabolic processes and normal physiological functions. Lead toxicity induced anemia is due to the inhibition of heme synthesis by lead. Severe cases of toxicity can cause kidney damage and result in excessive urinary nutrient loss. The immune system is depressed and children cannot fight infections efficiently. Although many effects of lead toxicity are reversible, the neurological effects **are not** reversible. Preschool children are at greatest risk due to their higher metabolic rate and efficient gastrointestinal absorption rates of mineral elements. In addition, mouthing behaviors and pica may result in the ingestion of lead chips or dust.

Major Concerns

- Adequacy of diet: calcium, iron, vitamin C and zinc
- Fluid intake
- Anemia
- Normal growth and development
- Potential lead in environment
- Participation in Women, Infants and Children Program (WIC), if eligible

History and Evaluation:

- Diet history
- Maintain adequate calories and protein with a variety of foods to meet age appropriate nutritional requirements-refer to MSDH nutrition guide
- Maintain adequate intake of vitamin C, calcium, zinc, iron, fluid and fiber
- Plot Height for Age, Weight for Age, and Body Mass Index (BMI for children greater than or equal to two years) on National Center for Health Statistics (NCHS) Growth Charts

Recommended Clinical Therapy

The goal is for a child to achieve normal growth and development and maintain BLLs within acceptable limits. If a child has a venous blood lead level of ≥ 10 $\mu\text{g/dL}$, consult the CLPPP for guidance.

Follow-Up

Dietary history and assessment should be completed at each follow-up visit especially if chelation therapy is necessary. Assess growth parameters at each follow-up visit.

Nutritional Assessment Summary

A. Test children at risk for anemia e.g., those from low income, migrant or recently arrived refugee families, or those qualifying for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Between 9 and 12 months

6 months later

Annually from ages 2 to 5 years

B. Evaluate the diet of children at risk for anemia, paying particular attention to dietary iron, vitamin C, and calcium.

C. Make recommendations as necessary e.g. WIC, foods rich in iron and vitamin C, etc.

4. Developmental Assessment

Although BLLs peak in early childhood when young children are especially vulnerable to lead, negative effects are associated with lead exposure at any age. Lead has a continuing negative association with IQ as children reach elementary school age. ⁽²⁾

A developmental assessment such as the Denver II or similar tool is used when a child has a blood lead level ≥ 10 $\mu\text{g}/\text{dL}$.

Children less than 3 years of age should be referred to an early childhood intervention program if

- child has an abnormal developmental assessment.
- there is parental concern.

Long term developmental surveillance of any child with an elevated blood lead level should be conducted.

5. Education

Family Education

Lead poisoning is caused by swallowing or inhaling lead. Lead is a naturally occurring metal, but most lead in the environment is from prior lead use in paint and gasoline. Paint, soil, dust, tap water, some toys, crystal and pottery can all be sources of lead exposure. Signs and symptoms of lead poisoning may be irritability, nausea, developmental delays, behavior problems, hearing loss, growth failure, seizures and even death. All children are at risk regardless of where they live, socio-economic status, race or ethnicity. Lead poisoning is PREVENTABLE. **Lead publications are available through the MSDH.**

Lead dust from paint may be in carpets/rugs and cloth furniture near windows and plastic mini-blinds and on porches. Lead dust may also be on furniture and car seats where people who work with lead have sat in their work clothes. **If household environmental lead contamination exists, discuss importance of prevention and risk reduction strategies such as:**

Activities to decrease child/children's exposure to lead

- Wash hands, using soap and water (or baby wipes).
- Dust surfaces with a damp cloth.
- Keep children away from old painted surfaces and bare soil areas.
- Keep children from touching surfaces in old houses/buildings likely to have lead contaminated dust and dirt: porch surfaces, outside steps and ledges, window sills and troughs, and soil near house/building.
- Keep sand boxes and playground equipment away from old houses/buildings.
- Provide plastic chairs for young children sitting outside.
- Avoid food and drinks in imported cans.
- Do not allow children to play with metal house and car keys, as they may contain lead.
- Do not dry scrape painted surfaces.

Household Cleaning (floors)

- Wet mop and hose down porches and floors at least two times per week
 - Use three buckets/containers when cleaning floors (wash, rinse, and empty). Squeeze dirty mop water into the empty bucket and dump contents into a toilet.
- A wet-dry vacuum cleaner (shop-vac) used in the wet mode after pouring cleaner onto a floor or other hard surface can remove more lead dust from hard surfaces than wet mopping alone.
- Vinyl linoleum is the best flooring because it is easier to keep clean. Wood floors should be covered with vinyl or coated with polyurethane or enamel paint.
- Using a High Efficiency Particulate Air (HEPA) vacuum cleaner followed by wet mopping will remove the most lead dust from hard surfaces.
- HEPA vacuuming followed by steam cleaning will remove most of the lead dust from carpets and rugs, cloth furniture, and car seats. Using a fine-particle (micron or allergen) bag in a regular vacuum cleaner will help remove more lead dust.
- Discard dirty carpets, rugs and dirty cloth furniture. Cover furniture likely to have lead dust with washable coverings, such as sheets. In old houses, use washable mats and vinyl runners in high traffic areas. Wash mats and runners at least twice a week.

Abatement and Remediation

- Abatement is the controlled removal or enclosure of lead-based paint. It **MUST** be done by a professional certified by the Mississippi Department of Environmental Quality (DEQ). DEQ's phone number is 601-961-5171. Advise family members **NOT** to sand or scrape old paint themselves.

Other Sources

- Keep lead fishing sinkers, car and truck batteries and radiators in places not accessible to children.
- Any family member or regular visitor who might be exposed to lead should change work clothes, shoes and shower at work. (See table to right) If this is not possible at work, then as soon as arriving home. Be careful not to contaminate clothes, bedding, furniture, car interior, steps, and floors that children might touch. Lead-contaminated clothes should be stored in plastic bags and washed **SEPARATELY** from other clothes.
- Avoid ceramic ware (especially if imported from China, Mexico, Italy, or South Asia).

Environmental

- Metal house and car keys may have lead. Do not let children play with them.
- Old bathtubs and sinks often have lead.
- Window sills should be smooth and cleaned often with an all-purpose cleaner. Keep windows closed and cover window troughs with aluminum coil stock. Cover peeling paint on window sills with plastic tape, contact paper or plastic sheeting.
- Routinely dust to help alleviate accumulated household dust.
- Remove vinyl, plastic mini-blinds bought before 1997.
- Avoid growing vegetables in soil near old houses/buildings or near old painted fences.

List of Jobs/Hobbies that may involve lead:

- Paint removal, includes: sandblasting, scraping, abrasive blasting, sanding, or using a heat gun or torch
- Chemical strippers
- Remodeling, repairing, or renovating buildings or dwellings, or tearing down buildings or metal structures (demolition)
- Plumbing
- Repairing radiators, tire balancing
- Melting metal for reuse (smelting)
- Welding, burning, cutting, or torch work
- Pouring molten metal (foundries)
- Auto body repair
- Making paint or pigment
- Painting
- Salvaging metal or batteries
- Making or splicing cable or wire
- Creating explosives, ammunition, or fishing sinkers
- 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

IV. Case Closure

The ultimate objective of the case management process is to assure the medical treatment of the lead poisoned child and that the environmental exposure routes (sources) are addressed. There are potentially two different forms of case closure.

- **Medical closure:** The child's primary care provider and the CLPPP case manager address medical closure defined as one venous BLL < 10 µg/dL.
- **Administrative closure:** Indicates the child will no longer be followed. The case manager must determine if an administrative closure is appropriate.

Reasons for administrative closure include:

- The blood lead level has decreased appropriately. The child is **not** currently in a lead safe environment; however, steps are being taken to address lead exposure routes.
- Factors unrelated to the medical or environmental circumstances:
 - The child is lost to follow up after three varied attempts to locate.*
 - The child has missed three consecutive clinic appointments.
 - The child has moved out of the health jurisdiction.
 - The parent has refused services and has been given information about EBLLs and lead hazard control.
 - Repeat visits are too dangerous due to weapons, drug dealing, etc. (Appropriate referrals should be made.)

* Three varied attempts to locate the child can include any of the following:

- letter
- certified letter
- home visit
- contact with other programs/agencies (WIC, Medicaid, healthcare provider)
- contact the Post Office/providers for a forwarding address
- consult with the contact person given during admission

References

1. American Academy of Pediatrics Committee on Environmental Health. Lead Exposure in Children: Prevention, Detection and Management. *Pediatrics* 2005; 116:1036-46.
2. Centers for Disease Control and Prevention: Interpreting and Managing Blood Lead Levels <10 µg/dL in Children and Reducing Childhood Exposures to Lead: Recommendations of CDC's Advisory Committee on Childhood Lead Poisoning Prevention. *MMWR Recommendations and Reports November 2, 2007/56 (RR08);1-14;16*. Available at: <http://www.cdc.gov/MMWR/preview/mmwrhtml/rr5608a1.htm>. Accessed January 28, 2008.
3. Centers for Disease Control and Prevention.(March 2002) *Managing Elevated Blood Lead Levels Among Young Children: Recommendations From the Advisory Committee on Childhood Lead Poisoning Prevention*. Atlanta, GA: Centers for Disease Control and Prevention; 2002. Available at: www.cdc.gov/nceh/lead/CaseManagement/caseManage_main.htm. Accessed January 22, 2008.
4. [Health.state.ga.us/pdfs/epi/notifiable/lead.fs.02.pdf](http://health.state.ga.us/pdfs/epi/notifiable/lead.fs.02.pdf)
5. U.S. Census Bureau, Census 2000 Summary File 3, Matrices H36, H37, H38, and H39. Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=01000US&-qr_name=DEC_2000_SF3_U_QTH7&-ds_name=DEC_2000_SF3_U. Retrieved 3/18/2008.
6. North Carolina Department of Environment and Natural Resources: *Childhood Lead Testing and Follow-up Manual*. Revised 2005
7. Centers for Disease Control and Prevention: Tested and Confirmed Elevated Blood Lead Levels by State, Year and Blood Lead Level Group for Children <72 mos http://www.cdc.gov/nceh/lead/surv/database/State_Confirmed_byYear_1997_to_2006.xls Retrieved 3/20/2008.
8. Mississippi Childhood Lead Poisoning Prevention Program: Lead Poisoning Elimination Plan-August 23, 2007. www.msdh.state.ms.us/msdhsite/_static/resources/2494.pdf Retrieved January 20, 2008.
9. Wisconsin Lead Poisoning Information: Chapter 7 Screening & Diagnosis of Childhood Lead Poisoning. <http://dhfs.wisconsin.gov/lead/doc/Chap7Screen.pdf> Retrieved January 20, 2008.
10. Mississippi State Department of Health: Mississippi Childhood Lead Poisoning Prevention Guidance April 14, 2003 www.msdh.state.ms.us/msdhsite/_static/resources/757.pdf. Retrieved January 22, 2008.

APPENDIX A: Roles and Responsibilities for Providing Case Management Services

Public Health Department/ Cool Kids Provider Role	Primary Care Medical Provider Role	Lead Case Manager/CLPPP Role
Confirmed Blood Lead Levels 10 – 14 µg/dL		
<ol style="list-style-type: none"> 1. Inform family of EBLL. 2. Provide anticipatory guidance. 3. Provide hazard and risk reduction education to family. 4. Include history of EBLL as a part of permanent medical problem list in the child’s medical record. 5. Obtain developmental screening (i.e.: Denver II) 6. Evaluate iron status with Hct/Hgb testing and provide appropriate treatment as indicated. 7. Repeat BLL testing every three months, until two venous results < 10 µg/dL, or three results < 15 µg/dL, then annually. 	<ol style="list-style-type: none"> 1. Include history of EBLL as part of permanent medical problem list in the child’s medical record. 2. If child is not receiving medical services through public health department, proceed as in steps 1-6. 3. Refer to nutritionist for nutritional counseling. 	<ol style="list-style-type: none"> 1. Inform primary care provider of EBLL results. 2. Encourage family compliance with BLL testing schedule.
Confirmed Blood Lead Levels 15 – 19 µg/dL		
<ol style="list-style-type: none"> 1. Inform family of EBLL. 2. Provide anticipatory guidance. 3. Provide hazard and risk reduction education to family. 4. Include history of EBLL as a part of permanent medical problem list in the child’s medical record. 5. Obtain developmental screening (i.e.:Denver II) 6. Evaluate iron status with Hct/Hgb testing and appropriate treatment as indicated. 7. Repeat BLL testing every three months until two venous results, <10 µg/dL, or 3three < 15 µg/dL, then annually. If BLL remains 15 – 19 µg/dL after 6 months, repeat annually, and case should be treated as BLL 20-44 µg/dL. 	<ol style="list-style-type: none"> 1. Include history of EBLL as a part of permanent medical problem list in the child’s medical record. 2. If child is not receiving medical services through public health department, proceed as in steps 1-6. 3. Refer to nutritionist for nutritional counseling. 	<ol style="list-style-type: none"> 1. Consult with MSDH Clinician and inform child’s Primary Care Medical Provider. 2. Inform primary care provider of EBLL results. 3. Within two weeks of receipt of EBLL results, a home visit by a qualified individual is conducted using the appropriate form. A copy of the assessment form will be forwarded to the CLPPP environmentalist and the child’s medical provider. 4. Encourage family compliance with BLL testing schedule. 5. For children with persistent BLLs 15-19 µg/dL or anything > 20µg/dL, referrals will be made for environmental investigation. 6. If BLL persists at 15 – 19 µg/dL, Lead Case Manager initiates services specified for children with BLL 20 – 44 µg/dL.

Public Health Department/ Cool Kids Provider Role	Primary Care Medical Provider Role	Lead Case Manager/CLPPP Role
Confirmed Blood Lead Levels 20 – 44 µg/dL		
<ol style="list-style-type: none"> 1. Inform family of EBLL. 2. Provide anticipatory guidance. 3. Provide hazard and risk reduction education to family. 4. Include history of EBLL as a part permanent problem list in child’s medical record. 5. Obtain developmental screening (i.e.: Denver II) 6. Evaluate iron status with Hct/Hgb testing and appropriate treatment as indicated. 7. Screen other children in household <6 years old. 8. Repeat BLL within one to two month intervals for six months until these three conditions are met: a) BLL has remained < 15 µg/dL, for at least six months and b) lead hazards have been removed or child lives in a lead-safe environment, and c) no new exposure, then annually. 9. If BLL remains between 20 – 44 µg/dL, after six months, refer to State CLPPP for additional environmental follow-up. 	<ol style="list-style-type: none"> 1. Include history of EBLL as a part of permanent problem list in the child’s medical record. 2. If child is not receiving medical services through public health department, proceed as in steps 1-6. 3. Refer to nutritionist for nutritional counseling. 	<ol style="list-style-type: none"> 1. Consult MSDH clinician and inform child’s primary care provider. 2. Within two weeks of receipt of EBLL results, a home visit by a qualified individual is conducted using the appropriate form. A copy of the assessment form will be forwarded to the CLPPP environmentalist and the child’s medical provider. 3. Within one week, a referral will be made to the State Environmentalist for an environmental home investigation. The State Environmentalist will communicate the results of the investigation to the family. 4. CLPPP will develop a written Plan of Care for the family to include hazard education, encouragement of compliance, BLL testing schedule, referrals for social, developmental, nutritional, housing remediation, and other services as appropriate. 5. Monitor progress toward achievement of Plan of Care goals at least quarterly. 6. Conduct a home visit before case closure. Review case and close case when criteria have been met for discharge and CLPPP notifies medical provider and family of discharge.

Public Health Department/ Cool Kids Provider Role	Primary Care Medical Provider Role	Lead Case Manager/CLPPP Role
Confirmed Blood Lead Levels 45 – 69 µg/dL		
<ol style="list-style-type: none"> 1. Inform family of EBLL. 2. Provide anticipatory guidance. 3. Provide hazard and risk reduction education to family. 4. Include history of EBLL as a part of permanent problem list in the child's medical record. 5. Obtain developmental screening (i.e.: Denver II). 6. Evaluate iron status with Hct/Hgb testing and appropriate treatment as indicated. 7. Screen other children in household <6 years old. 8. Encourage compliance with BLL testing schedule. 	<ol style="list-style-type: none"> 1. Complete medical and history exam. 2. Evaluate iron status with Hct/Hgb testing and appropriate treatment as indicated. 3. Consider referral to a toxicologist or other physician in a tertiary care center for children who has experience with chelating agents. 4. Repeat BLL within one to two month intervals for 6 months until the following criteria are met: <ol style="list-style-type: none"> a) BLL has remained < 15 µg/dL for at least 6 months and b) lead hazards have been addressed c) annually after (a) and (b) have been met. 5. If BLL remains between 20-44 µg/dL after 6 months, refer to State CLPPP for additional follow-up. 	<ol style="list-style-type: none"> 1. Consult MSDH clinician and inform child's primary care provider of EBLL. 2. Immediately Refer to PCP for complete medical history, physical exam, developmental screening. 3. Within 48 hours of receipt of EBLL results, a home visit by a qualified individual is conducted using the appropriate form. A copy of the assessment form will be forwarded to the CLPPP environmentalist and the child's primary care medical provider. 4. Refer to Early Intervention Program for developmental evaluations. 5. Results of all home assessments and evaluations will be forwarded to the primary care provider. 6. Within 48 hours, environmental investigation will be completed and the State environmentalist will be responsible for communicating the results to the family and providing a copy of the report to the child's primary care provider. 7. CLPPP will develop a written plan of care for the family including hazard education, encouragement of compliance with BLL testing schedule, referrals for social, developmental, nutritional, housing remediation, and other services as appropriate. 8. Monitor progress toward achievement of Plan of Care quarterly. 9. Conduct a home visit before case closure. Review case and close case when criteria for discharge have been met. Notify PCP and family of discharge.

Public Health Department/ Cool Kids Provider Role	Primary Care Medical Provider Role	Lead Case Manager/CLPPP Role
Confirmed Blood Lead Levels ≥ 70 $\mu\text{g}/\text{dL}$		
	<ol style="list-style-type: none"> 1. Refer to a toxicologist or other physician in a tertiary care center (for children) who has experience with chelating agents. 2. If chelation is involved, notify CLPPP immediately. 3. Repeat BLL within one to two month intervals for six months until the following criteria are met: <ol style="list-style-type: none"> a) BLL has remained < 15 $\mu\text{g}/\text{dL}$ for at least six months b) lead hazards have been addressed c) annually after (a) and (b) have been met 4. If BLL remains between 20-44 $\mu\text{g}/\text{dL}$ after six months, refer to State CLPPP for additional environmental follow-up. 5. Evaluate iron status with Hct/Hgb testing and appropriate treatment as indicated. 	<ol style="list-style-type: none"> 1. Medical Emergency – Consult with MSDH Clinician. 2. Notify Child’s PCP immediately. 3. Within 24 hours of receipt of EBLL results, a home visit by a qualified individual is conducted using the appropriate form. A copy of the assessment form will be forwarded to the CLPPP environmentalist and the child’s medical provider. 4. Refer to Early Intervention Program for developmental evaluations. 5. Results of all home assessments and evaluations will be forwarded to the primary care provider. 6. Within 48 hours, environmental investigation will be completed and the State environmentalist will be responsible for communicating the results to the family and providing a copy of the report to the child’s primary care provider. 7. CLPPP will develop a written plan of care for the family including hazard education, encouragement of compliance with BLL testing schedule, referrals for social, developmental, nutritional, housing remediation, and other services as appropriate. 8. Monitor progress toward achievement of Plan of Care quarterly. 9. Conduct a home visit before case closure. Review and close case when criteria for discharge have been met. Notify PCP and family of discharge.

APPENDIX B

Physician/Clinician Recommendations to Mitigate Lead Exposure

1. Provide anticipatory guidance to parents of all infants and toddlers about preventing lead poisoning in their children. In particular, parents of children 6 months to 3 years of age should be made aware of normal mouthing behavior and should ascertain whether their homes, work, or hobbies present a lead hazard to their toddler. Inform parents that lead can be invisibly present in dust and can be ingested by children when they put hands and toys in their mouths.
2. Inquire about lead hazards in housing and child care settings, as is done for fire and safety hazards or allergens. If suspicion arises about the existence of a lead hazard, the child's home should be inspected. Generally, health departments are capable of inspecting housing for lead hazards. Expert training is needed for safe repair of lead hazards, and pediatricians should discourage families from undertaking repairs on their own. Children should be kept away from remediation activities, and the house should be tested for lead content before the child returns.
3. Know state Medicaid regulations and measure blood lead concentration in Medicaid-eligible children. If Medicaid-eligible children are a significant part of a pediatrician's practice or if a pediatrician has an interest in lead poisoning, he or she should consider participating in any deliberations at the state and local levels concerning an exemption from the universal screening requirement.
4. Find out if there is relevant guidance from the city or state health department about screening children not eligible for Medicaid. If there is none, consider screening all children. Children should be tested at least once when they are 2 years of age or, ideally, twice, at 1 and 2 years of age, unless lead exposure can be confidently excluded. Pediatricians should recognize that measuring blood lead concentration only at 2 years of age, when blood lead concentration usually peaks, may be too late to prevent peak exposure. Earlier screening, usually at 1 year of age, should be considered where exposure is likely. A low blood concentration in a 1-year-old, however, does not preclude elevation later, so the test should be repeated at 2 years of age. Managed health care organizations and third-party payers should fully cover the costs of screening and follow-up. Local practitioners should work with state, county, or local health authorities to develop sensitive, customized questions appropriate to the housing and hazards encountered locally.
5. Be aware of any special risk groups that are prevalent locally, such as immigrants, foreign-born adoptees, refugees, or children whose parents work with lead or lead dust in their occupation or hobby and, of course, those who live in, visit, or work on old houses.
6. In areas with old housing and lead hazards, encourage application for HUD or other moneys available for remediation.
7. Keep current with the work of the national Advisory Committee on Childhood Lead Poisoning Prevention and any relevant local committees. Although there is now evidence that even lower blood lead concentrations may pose adverse effects to children, there is little experience in the management of excess lead exposure in these children. Although most of the recommendations concerning case management of children with blood lead concentrations of 15 µg/dL should be appropriate for children with lower concentrations, tactics that decrease blood lead concentrations might be expected to be less and less effective as they are applied to children with lower and lower blood lead concentrations.

AAP, October 2005