Table of Contents

Acknowledgements

This guideline is intended for use by Children's Wisconsin providers and staff to ensure consistent care delivery across the system that adheres to evidence-based best practices regarding blood lead screening, testing, and response to results. It was developed in partnership between the Integrated Lead Program, Children's Primary Care, Medical Toxicology, Children's Gastroenterology, the City of Milwaukee Health Department's Childhood Lead Home Environmental Health program, and the Wisconsin Poison Center.

Acronyms used throughout this document	
AST/ALT	Aspartate aminotransferase/Alanine transaminase
BLL	Blood lead level
BUN	Blood urea nitrogen
CBC without diff	Complete blood count without differential
CMG	Children's Medical Group (primary care practices at Children's Wisconsin)
CPSE	Committee on Preschool Special Education (through local school district)
DHS	Department of Health Services
EBLL	Elevated blood lead level
Fe	Iron
H/H	Hemoglobin and hematocrit
HEH	Home Environmental Health
LHD	Local health department
MHD	City of Milwaukee Health Department
PHN	Public health nurse
POCT	Point of care test
UA	Urinalysis

Note: CRP and ZPP were included in previous versions of these guidelines, removed in 2025 to align with updated Poison Center recommendations.

Lead Care Management

Clinical Guideline

Wisconsin Childhood Blood Lead Testing Recommendations

Wisconsin recommends universal testing which includes:

- **All** children at age 1 and again at age 2
- Any children between ages 3 and 5 without a previous test

These recommendations match the federal Medicaid requirement. Additional testing may be recommended in the city of Milwaukee.

All children under 17 years of age can be tested if the:

- Parent or guardian expresses concern about lead exposure or asks for their child to be tested for lead poisoning.
- Health care provider becomes aware of changes in possible lead exposure or risk factors in a child.
- Child is a newly arrived refugee. Test upon arrival and 3-6 months after the initial blood test.

Procedure reminders

Ensure proper handwashing before taking the sample.

Follow the Centers for Disease Control (CDC) steps for lead testing on capillary draws.

All lead tests on Wisconsin residents must be reported to Wisconsin Department of Health Services (DHS).

CDC information on testing children for lead poisoning:
www.cdc.gov/nceh/lead/prevention/testing-children-for-lead-poisoning.htm

Wisconsin Department of Health Services
Childhood Lead Poisoning and Prevention Program
DHSLeadPoisoningPrevention@dhs.wisconsin.gov
608-266-5817
P-03557 (01/2024)

More information about pediatric lead testing and reporting in Wisconsin is available at www.dhs.wi.gov/lead/test-your-child.htm

City of Milwaukee Local Lead Testing Recommendations:

- Three tests by age three
  - 12 months
  - 18 months
  - 24 months
- Annual for ages 3-6 for all children who reside in the City of Milwaukee
  - 3 years
  - 4 years
  - 5 years

Other POCT testing considerations:

- If the patient or family recently moved to the United States, consider POCT testing even above the age of 6
- Typically, lead testing should be performed every 6 months to one year based on the child's risk factors and primary city of residence. Factors to consider testing again at a shorter interval could include
  - Family recently moved to a new residence
  - Child recently began displaying behaviors of pica
  - Family member recently began working in an occupation or have a recreational hobby with potential lead hazard exposure
  - Family (household) members of recently identified lead-poisoned individuals
  - Recent renovation/remodeling in a house built before 1978
  - Recent immigration to the United States

Lead Care Management

Clinical Guideline

Recommended Actions by Result Level & Type:

Universal Recommendations for all Blood Lead Levels

Capillary	Venous

Education:
• Explain that child may need repeat routine lead testing in the future based on their age or risk
• All elevated capillary levels (≥3.5µg/dL) require follow-up action or plan
• Children's WI Teaching Sheet:
  ○ Being Safe Around Lead (1936)
• KidsHealth (Digital Care) resources:
  ○ [PARENTS] Lead Poisoning
 	
Health Department involvement:
• All lead results are reported to WI DHS by Lab staff at the end of every business day and by CMG team within 72 hours
• WI DHS database sends BLL results to the associated local health department based on address of residence
 	
Referrals/Consults:
• At CW, the Centralized Lead Care Management team will make outreach to all families who have not completed confirmatory venous lead draws within 4 weeks.
  ○ Screen for barriers such as transportation. For CW staff, submit a referral if a family has known transportation barriers and needs more prompt outreach. Use Epic referral AMB REFERRAL TO LEAD CARE MANAGEMENT
  ○ If CW providers would like the Lead Nurse Care Manager to provide a one-time education reinforcement call, complete a referral and add comment "EBLL; education reinforcement"
• Perform an environmental assessment with initial EBLL or change in residence. For CW staff, use Epic flow sheet "Environmental Exposure Assessment (short version)" to document environmental exposure history
	Education:
	• Explain that child may need repeat lead testing in the future based on their age, risk, or BLL
	• Children's WI Teaching Sheet:
	  ○ Being Safe Around Lead (1936)
	• KidsHealth (Digital Care) resources:
	  ○ [PARENTS] Lead Poisoning
	• For all children with confirmed EBLL, make a strong recommendation that the child should be enrolled in quality early childhood programming and encourage brain-building activities and routines.
	  ○ AAP Quality Early Child Care Policy
	  ○ CDC Milestones Tracker
	
	Health Department involvement:
	• All lead results are reported to WI DHS by Lab staff at the end of every business day
	• WI DHS sends BLL results to the respective local health department
	• Local health department involvement with individual cases is based on venous BLL and LHD where child resides; resources vary by individual LHD
	• Wisconsin state statute 254.164 outlines required LHD involvement for EBLL (≥20µg/dL x 1 test or ≥15µg/dL x 2 tests at least 90 days apart)
	
	Referrals/Consults:
	• Call Poison Center if any questions regarding guideline recommendations 800 – 222 – 1222 or BLL management
	  ○ You can also e-consult Medical Toxicology for any complicated case or questions you might have
	• Ensure regular developmental monitoring; consider more frequent developmental screenings using a validated measure, with referrals as indicated to Birth to 3 or school/CPSE evaluations.
	• At CW, the Centralized Lead Care Management team supports all patients of our primary care with a venous blood lead level ≥15 µg/dL AND reside within the City of Milwaukee. Auto-referrals occur for patients who meet these criteria.

	○ If CW providers would like the Lead Nurse Care Manager to provide a one-time education reinforcement call for patients who do not meet the criteria above, please complete a referral and add comment "EBLL; education reinforcement". Use Epic referral AMB REFERRAL TO LEAD CARE MANAGEMENT • Perform an environmental assessment with initial EBLL or change in residence. For CW staff, use Epic flow sheet "Environmental Exposure Assessment (short version)" to document environmental exposure history
<3.5 µg/dL	
Capillary	**Venous**
Order: • No further orders required **Health Department involvement:** • None	**Order:** • No further orders required at this time • Child returns to routine POCT lead testing track based on age/risk **Health Department involvement:** • None
3.5-9.9 µg/dL	
Capillary	**Venous**
Order: • Venous BLL for confirmation ○ If confirmatory is ≥3.5 µg/dL, all future blood lead tests should be venous until level is < 3.5 µg/dL **Referrals:** • Call Poison Center if any questions regarding guideline recommendations 800 – 222 - 1222 **Environmental Considerations:** • Discuss potential sources of lead in the child's environment including chipping paint on the interior or exterior of the home, lead dust, occupational or recreational hazards, or cultural items **Education:** • Reinforce importance of obtaining a confirmatory venous sample in order to determine plan of care • See Universal Recommendations **Health Department involvement:** • See Universal Recommendations	**Order:** • Repeat venous BLL and H/H within 1-3 months, per provider discretion*, after confirmed EBLL to establish trend • Once trend established, venous BLL and H/H q 3 months until decreasing • Once decreasing, BLL and H/H q 6 – 9 months, per provider discretion* • If repeat BLL rises; re-initiate venous protocol based on the elevated BLL *Provider discretion should be based on the rate of change in BLL as well as social or medical factors such as housing stability, health status, and barriers to follow-up. **Education:** • See Universal Recommendations **Health Department involvement:** • City of Milwaukee-letter with test result and educational hazard reduction instructions mailed to families.

Lead Care Management

Clinical Guideline

10 – 14.9 µg/dL	
Capillary	**Venous**

Order:
• Venous BLL for confirmation
  ○ If confirmatory is ≥3.5 µg/dL, all future blood lead tests should be venous until level is < 3.5 µg/dL
• Anemia/iron deficiency evaluation should also be obtained for venous BLL results in this range. If the family has transportation or other barriers to returning to lab, consider ordering these additional studies with the initial confirmatory venous BLL draw
 	
Referrals & Consults:
• See Universal Recommendations
 	
Environmental Considerations:
• Discuss potential sources of lead in the child's environment including chipping paint on the interior or exterior of the home, lead dust, occupational or recreational hazards, or cultural items
 	
Education:
• Reinforce importance of obtaining a confirmatory venous sample in order to determine plan of care
• Explain that all lead results must be reported to WI DHS. Local health departments may make outreach to families with elevated results
• See Universal Recommendations
 	
Health Department involvement:
• All lead results are reported to WI DHS by Children's CMG or Lab staff within 48 hours. WI DHS then sends elevated results to appropriate LHD
• Letter with test result and educational materials mailed to family. Letter reinforces recommendation for venous confirmatory testing
	Order:
	• Repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) 1 month after initial confirmatory
	• Subsequent serial venous lead and H/H labs every 1-3 months, per provider discretion*, after confirmed EBLL to establish trend
	• Once venous BLL is stabilized or trending down, repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3-6 months, per provider discretion*, until level is < 10 µg / dL
	• If repeat BLL rises; re-evaluate for changes in environment and follow protocol for that venous BLL
	• Fe supplementation if indicated
	• Consider XR abdomen based on clinical judgment (caregiver report of eating paint chips, history of pica, etc.)
	• Oral bowel clean out if XR abdomen shows lead in abdomen
	  ○ Oral clean out can be performed at home, per clinical discretion.
	  ○ Refer to Appendix Three: GI Clean Out for Children with Lead Poisoning for oral clean out recommendations from CW GI Constipation Clinic and Medical Toxicology
	  ○ Repeat XR abdomen after oral clean out is complete to ensure lead clear small intestine
	
	*Provider discretion should be based on the rate of change in elevated BLL as well as social or medical factors such as housing stability, health status, and barriers to follow-up.
	
	Referrals & Consults:
	• See Universal Recommendations
	
	Education:
	• Explain plan of care for repeat venous BLL testing
	• See Universal Recommendations
	
	Health Department involvement:
	• City of Milwaukee- letter with test result and educational hazard reduction instructions mailed to families.

<table>
<tr><td></td><td>

- Additional Public Health Nursing education outreach with referral for lead hazard assistance with community partners are made at this level.

</td></tr>
<tr><td colspan="2">15 – 19.9 µg/dL</td></tr>
<tr><td>

Capillary

Order:

- Venous BLL for confirmation
  - If confirmatory is ≥3.5 µg/dL, all future blood lead tests should be venous until level is < 3.5 µg/dL
- Evaluate for iron deficiency/anemia
- Consider XR abdomen based on clinical judgment (caregiver report of eating paint chips, history of pica, etc.)

Referrals & Consults:

- See Universal Recommendations

Environmental Considerations:

- Discuss potential sources of lead in the child's environment including chipping paint on the interior or exterior of the home, lead dust, occupational or recreational hazards, or cultural items

Education:

- Reinforce importance of obtaining a confirmatory venous sample in order to determine plan of care
- Explain that all lead results must be reported to WI DHS. Local health departments may make outreach to families with elevated results
- See Universal Recommendations

Health Department involvement:

- All lead results are reported to WI DHS by Children's CMG or Lab staff within 48 hours. WI DHS then sends elevated results to appropriate LHD
- LHD will make outreach to families to reinforce need to have confirmatory venous drawn

</td><td>

Venous

Order:

- 1 month after initial confirmatory venous: Repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin)
- Subsequent serial venous lead and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) every 1-3 months, per provider discretion*, after confirmed EBLL to establish trend (stable or decreasing)
- Once venous BLL is trending down: repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3-6 months, per provider discretion*, until level is < 10 µg / dL; then follow recommendations for that new level
- If repeat BLL rises; re-evaluate for changes in environment and follow protocol for that venous BLL
- Fe supplementation if indicated
- Oral bowel clean out if XR abdomen shows lead in abdomen
  - Oral clean out can be performed at home, per clinical discretion
  - Refer to Appendix Three: GI Clean Out for Children with Lead Poisoning for oral clean out recommendations from CW GI Constipation Clinic and Medical Toxicology
  - Repeat XR abdomen after oral clean out complete to ensure lead clear small intestine

*Provider discretion should be based on the rate of change in elevated blood lead levels and health related social needs such as housing stability, health status, and barriers to follow-up

Referrals & Consults:

- See Universal Recommendations

Environmental Considerations:

- The child may meet case criteria for their local health department to complete a home inspection to identify lead hazards (see Universal Recommendations)

</td></tr>
</table>

	• For children who reside in the City of Milwaukee, the Centralized Lead Care Management nurse care manager will complete a full environmental exposure history using Epic flow sheet "Environmental Exposure Assessment" for initial venous result ≥15 µg/dL or change in residence during initial contact with family, typically within 72 hours of venous result **Education:** • Explain plan of care for repeat venous BLL testing • Discuss role of the local health department in overall plan of care • See Universal Recommendations **Health Department involvement:** • All lead results are reported to WI DHS by Children's Lab staff within 48 hours. WI DHS then sends elevated results to appropriate local health departments • See Universal Recommendations • City of Milwaukee-Public Health Nursing case management services include education, home visit(s), growth and development assessments with referrals if indicated, and ongoing care coordination. Home is inspected for lead hazards within 14 business days with orders to correct lead hazards if identified.

20 – 44.9 µg/dL	
Capillary	**Venous**

Order:
• Venous BLL for confirmation
  ○ Confirmatory BLL should be drawn within two business days
  ○ If confirmatory is ≥3.5 µg/dL, all future blood lead tests should be venous until level is < 3.5 µg/dL
• Evaluate for iron deficiency/anemia
• XR abdomen
 	
Referrals & Consults:
• Call Poison Center if questions regarding plan of care 800 – 222 – 1222
• LHD will be notified of elevated result through WI DHS to initiate their protocol
• See Universal Recommendations
	Order:
	• Admission may be required for bowel clean out if XR abdomen shows lead in the abdomen. Consult Poison Center to determine disposition for clean out (inpatient versus outpatient)
	  ○ Refer to Appendix Three: GI Clean Out for Children with Lead Poisoning for oral clean out recommendations from CW GI Constipation Clinic and Medical Toxicology if cleared for outpatient bowel clean out
	  ○ Repeat XR abdomen after oral clean out complete to ensure lead clear small
	• Two weeks after initial confirmatory venous: Repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin)

Lead Care Management

Clinical Guideline

Environmental Considerations:

- Discuss potential sources of lead in the child's environment including chipping paint on the interior or exterior of the home, lead dust, occupational or recreational hazards, or cultural items
- See Universal Recommendations

Education:

- Reinforce importance of obtaining a confirmatory venous sample in order to determine plan of care
- Explain that all lead results must be reported to WI DHS. Local health departments may make outreach to families with elevated results
- See Universal Recommendations

Health Department involvement:

- All lead results are reported to WI DHS by Children's CMG or Lab staff within 48 hours. WI DHS then sends elevated results to appropriate local health departments
- Local health department will make outreach to family including reinforcement of need for confirmatory venous testing

- Subsequent serial venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) every 2 weeks - 1 month, per provider discretion*, after initial confirmatory venous
- Once venous BLL is trending down, repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 1-3 months, per provider discretion*, until level is < 10 µg / dL
- If repeat BLL rises; re-evaluate for changes in environment and follow protocol for that venous BLL
- Fe supplementation if indicated

*Provider discretion mentioned above should be based on the rate of change in elevated blood lead levels as well as health related social needs such as housing stability and barriers to follow-up

Referrals & Consults:

- See Universal Recommendations

Environmental Considerations:

- The child meets case criteria for their local health department to complete a home inspection to identify lead hazards (see Health Department involvement section below for further details)
- PCP or clinic staff designee should use Epic flow sheet "Environmental Exposure Assessment (short version)" to document an abbreviated environmental exposure history with initial elevated lead or change in residence
  - For children who reside in the City of Milwaukee, the CW Centralized Lead Care Management Lead Nurse Care Manager will complete a full environmental exposure history using Epic flow sheet "Environmental Exposure Assessment" for initial venous result ≥15 µg/dL or change in residence within 72 hours of venous result
- Local health department will perform home lead risk assessment within one week of receiving venous results. Orders for lead abatement will be placed based upon results and in-home education of mitigation strategies will be provided
- Consider housing referral if family indicates housing insecurity.
  - Complete this form for CCHP members

	○ Complete this form for non-CCHP members with the family and email to housing@childrenswi.org **Education:** • Explain plan of care for repeat venous BLL testing • Discuss role of the local health department in overall plan of care • See Universal Recommendations **Health Department involvement:** • All lead results are reported to WI DHS by Children's Lab staff within 48 hours. WI DHS then sends elevated results to appropriate local health departments • See Universal Recommendations • City of Milwaukee-Accelerated Public Health Nursing case management services with same day outreach to family and Primary Care Provider for care plan. Home is inspected for lead hazards within 5 business days with orders to correct lead hazards if identified. Children are not allowed at primary address during lead hazard reduction.

45 – 69.9 µg/dL	
Capillary	**Venous**
Order: • This is considered a critical result. Repeat capillary POCT test in-clinic after re-performing thorough hand washing technique. If repeat POCT is still ≥ 45 µg/dL, CW OP lab will complete venous blood results same day to inform plan of care ○ Page CW Lab Managers (414-907-8200) with highly elevated POCT result and need for same-day venous sample results • STAT venous blood lead level, Ferritin, H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin), BUN/Cr, AST/ALT, UA (urine dip in-clinic is adequate – looking for proteinuria) – samples to be obtained same day as the POCT critical result ○ If confirmatory is ≥3.5 µg/dL, all future blood lead tests should be venous until level is < 3.5 µg/dL	***Please note: if a venous lead result processed at Children's Lab of >55.5 is seen, this is not a final result and the result may be significantly higher. The lab is re-diluting and re-running the specimen for a final result. Final result may take a full day to be processed and entered.*** **Order**: • Consult Poison Center to determine plan of care 800 – 222 – 1222 • May require admission for bowel clean out if XR abdomen is positive for lead. Will initiate chelation inpatient once clean out is complete. Consult Poison Center (800 – 222 – 1222) to determine disposition for clean out (inpatient versus outpatient). Repeat XR abdomen to ensure lead clear small intestines before initiating chelation • DMSA (Succimer): 10 mg/kg po q 8 hours for 5 days; then 10 mg/kg po q 12 hours for 14 days ○ Chelation therapy requires AMB Medical Toxicology consult • Refer to Appendix Two for During Chelation and Post-Chelation Recommended Plan of Care

Lead Care Management

Clinical Guideline

- XR abdomen – to be obtained same day
  - Consider "call with results" on order to ensure prompt reporting of results to PCP for plan of care

Referrals & Consults:

- Consult Poison Center if questions regarding plan of care 800 – 222 – 1222
- For CW staff, if transportation barriers are present, complete a referral to CW Centralized Lead Care Management program for family support in getting to outpatient lab for venous draws and imaging via Epic referral AMB REFERRAL TO LEAD CARE MANAGEMENT

Environmental Considerations:

- Ensure family has an understanding of interim environmental mitigation strategies and ability to perform before child returns to home environment
- If unable to ensure interim strategies – consider alternative places to stay until full home assessment can be completed by Health Department.
  ****Note** – local health department interventions do not begin until the confirmatory venous is known**

Education:

- Reinforce importance of obtaining a confirmatory venous sample and XR abdomen in order to determine plan of care
- Anticipatory guidance that an admission may be required based on venous and abdominal x-ray results
- Explain that all lead results must be reported to WI DHS. Local health departments may make outreach to families with elevated results

Health Department involvement:

- All lead results are reported to WI DHS by Children's CMG or Lab staff within 48 hours. WI DHS then sends elevated

- If chelation is not indicated – consult AMB Medical Toxicology via call to Poison Center 800 – 222 – 1222 for development of plan of care
  - Two weeks after initial confirmatory venous: Repeat venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin)
  - Subsequent serial venous BLL and H/H (or CBC without diff) q 2 weeks - 1 month after confirmatory venous, per provider discretion*
- Once trend is established, continue to consult AMB Medical Toxicology for plan of care on cadence of serial lab draws
- If repeat BLL rises; re-evaluate for changes in environment and follow protocol for that venous BLL
- Fe supplementation as indicated

*Provider discretion mentioned above should be based on the rate of change in elevated blood lead levels as well as health related social needs such as housing stability and barriers to follow-up

Referrals & Consults:

- AMB Medical Toxicology referral via call to Poison Center 800 – 222 – 1222
- Call local health department where child resides for awareness of active case. Be prepared to share plan of care.
  - Click here for a list of contact information for all LHDs in Wisconsin
  - MHD CLPPP 414 – 286 - 2165
- If the child resides in the City of Milwaukee, complete a referral to CW Centralized Lead Care Management program via Epic referral AMB REFERRAL TO LEAD CARE MANAGEMENT
- See Universal Recommendations
- LHD will be actively involved in the case. Anticipate communicating with LHD nursing team to share plan of care

Environmental Considerations:

- For patients receiving chelation, it is essential the child is in a lead-safe environment during and immediately following chelation due to increased risk for further exposure and higher lead toxicity.
- For admitted patients, consult Medical Toxicology to complete full environmental exposure history during their inpatient stay. Do NOT discharge patient to primary residence until cleared by local health department.
- For non-admitted patients who reside in the City of Milwaukee and have a CMG PCP, Centralized Lead Care Management program nurse care manager will complete "Environmental Exposure Assessment" flow sheet within 72 hours and document in Epic

results to appropriate local health departments
• Local health department will make outreach to family including reinforcement of need for confirmatory venous testing
	• Consider housing referral if family indicates housing insecurity
	  ○ Complete this form for CCHP members
	  ○ Complete this form for non-CCHP members with the family and email to housing@childrenswi.org
	• LHD will perform home lead risk assessment within 48 hours of venous result being reported to LHD and place orders for abatement based on results
	• Family can remain in the home if cleared by LHD; they will be relocated during active abatement work
	
	Education:
	• See Universal Recommendations
	
	Health Department involvement:
	• All lead results are reported to WI DHS by Children's Lab staff within 24 hours. WI DHS then sends elevated results to appropriate local health departments
	• See Universal Recommendations
	• City of Milwaukee-Accelerated Public Health Nursing case management services with same day outreach to family and Primary Care Provider for care plan. Home is inspected for lead hazards within 48 hours with orders to correct lead hazards if identified. If child is hospitalized for chelation, discharge is planned for a lead safe residence that has had a lead risk assessment with interim controls for suspected lead hazards. Children are not allowed at primary address during lead hazard reduction.

≥ 70 µg/dL	
Capillary	**Venous**

Order:
• This is considered a critical result. Repeat capillary POCT test in-clinic after re-performing thorough hand washing technique. If repeat POCT is still ≥ 70 µg/dL, CW OP lab will complete venous blood results same day to inform plan of care
  ○ Page CW Lab Managers (414-907-8200) with highly elevated POCT result and need for same-day venous sample results
• STAT venous blood lead level, Ferritin, H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin), BUN, Creatinine, AST/ALT, UA (urine dip in-clinic is adequate –
	Please note: if a venous lead result processed at Children's Lab of >55.5 is seen, this is not a final result and the result may be significantly higher. The lab is re-diluting and re-running the specimen for a final result. Final result may take a full day to be processed and entered.
	
	Order:
	• Consult AMB Medical Toxicology via call to Poison Center 800 – 222 – 1222
	• Required admission for parenteral chelation and close monitoring in consultation with AMB Medical Toxicology team
	• Chelation (normal mental status)
	  ○ Succimer (oral) + CaNaEDTA IV
	  ○ Succimer monotheraphy if CaNaEDTA not available
	• Chelation (encephalopathic)
	  ○ Succimer (via NGT) 4 hours prior to CaNaEDTA IV

looking for proteinuria) – samples to be obtained same day as the POCT critical result
    - If confirmatory is ≥3.5 µg/dL, all future blood lead tests should be venous until level is < 3.5 µg/dL
- XR abdomen – should be obtained same day

Referrals & Consults:

- Consult Poison Center if questions regarding plan of care 800 – 222 – 1222
- For CW staff, if transportation barriers are present, complete a referral to CW Lead Care Management program to support same day lab and x-ray visits via Epic referral AMB REFERRAL TO LEAD CARE MANAGEMENT

Environmental Considerations:

- Top priority is chelation based on confirmatory venous level. Confirmatory venous to be obtained same day. Advise family to consider staying at an alternative residence until venous BLL results come in. If staying in an alternative residence, assess for financial strain and feasibility and document in Epic. If barriers present, refer to centralized lead program lead nurse care manager to support in care coordination

Education:

- Reinforce importance of obtaining a confirmatory venous sample and XR abdomen in order to determine plan of care
- Anticipatory guidance that an admission may be required based on venous and abdominal x-ray results
- Explain that all lead results must be reported to WI DHS. Local health departments may make outreach to families with elevated results
- See Universal Recommendations

Health Department involvement:

- All lead results are reported to WI DHS by Children's Lab staff within 24 hours. WI
    - Replace succimer with BAL if available
- Daily BLL and UA;
- BLL and CBC 2 and 4 weeks post chelation

Refer to Appendix Two for During Chelation and Post-Chelation Recommended Plan of Care

Referrals & Consults:

- AMB Medical Toxicology via call to Poison Center 800 – 222 – 1222
- Call local health department where child resides for awareness of active case. Be prepared to share plan of care.
    - Click here for a list of contact information for all LHDs in Wisconsin
    - MHD CLPPP 414 – 286 - 2165
- See Universal Recommendations

Environmental Considerations:

- Medical Toxicology to complete environmental exposure history during inpatient stay
- Consider housing referral if family indicates housing insecurity
    - Complete this form for CCHP members
    - Complete this form for non-CCHP members with the family and email to housing@childrenswi.org
- For patients receiving chelation, it is essential the child is in a lead-safe environment during and immediately following chelation due to increased risk for further exposure and higher lead toxicity. See Health Department involvement section below for details on timing of home environment risk assessment

Education:

- Explain plan of care for repeat venous BLL testing
- Discuss role of the local health department in overall plan of care
- See Universal Recommendations

Health Department involvement:

- Call local health department where child resides for awareness of active case.
    - Click here for a list of contact information for all LHDs in Wisconsin
    - MHD CLPPP 414 – 286 - 2165
- If child is receiving chelation therapy, LHD will perform environmental lead risk assessment within 24 hours to determine if home environment is lead safe and child can return home during chelation therapy. Encourage family to

DHS then sends elevated results to appropriate local health departments	collaborate with the LHD team to ensure a prompt home assessment • All lead results are reported to WI DHS by Children's Lab staff within 24 hours. WI DHS then sends elevated results to appropriate local health departments • City of Milwaukee-Accelerated Public Health Nursing case management services with same day outreach to family and Primary Care Provider for care plan. Home is inspected for lead hazards within 24 hours with orders to correct lead hazards if identified. If child is hospitalized for chelation, discharge is planned for a lead safe residence that has had a lead risk assessment with interim controls for suspected lead hazards. Children are not allowed at primary address during lead hazard reduction. • State statute case criteria for instituting case management: two venous BLL results drawn at least 90 days apart > 15 or one venous draw ≥ 20 µg/dL. ○ Local health departments may have case criteria at lower level

References

1. Advisory Committee on Childhood Lead Poisoning Prevention. Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention. Published 2012. Accessed December 18, 2025. https://www.cdc.gov/nceh/lead/docs/final_document_030712.pdf
2. Centers for Disease Control and Prevention. Blood Lead Levels Among U.S. Children <72 Months of Age, by State, Year, and Blood Lead Level (BLL) Group. Published 2021. Accessed December 18, 2025. https://www.cdc.gov/nceh/lead/docs/cbls-national-data-table-508.pdf
3. Centers for Disease Control and Prevention. Recommended actions based on blood lead level. Childhood Lead Poisoning Prevention. Updated December 2, 2022. Accessed December 18, 2025. https://www.cdc.gov/nceh/lead/advisory/acclpp/actions-blls.htm#anchor_1647349462703
4. Schlenker T, Fritz C, Mark D, et al. Screening for pediatric lead poisoning: comparability of simultaneously drawn capillary and venous blood samples. JAMA. 1994;271(17):1346-1348. doi:10.1001/jama.271.17.1346
5. Wisconsin Department of Health Services. Chapter 5: Screening and diagnosis of childhood lead poisoning. In: Standards for the Wisconsin Childhood Lead Poisoning Prevention Program. Published 2014. Accessed December 18, 2025. https://www.dhs.wisconsin.gov/publications/p00660-5.pdf
6. Wisconsin Department of Health Services. Chapter 6: Nursing case management of a child with lead poisoning. In: Standards for the Wisconsin Childhood Lead Poisoning Prevention Program. Published 2014. Accessed December 18, 2025. https://www.dhs.wisconsin.gov/publications/p00660-6.pdf
7. Wisconsin Department of Health Services. Chapter 7: Environmental assessment and intervention for a child with lead poisoning. In: Standards for the Wisconsin Childhood Lead Poisoning Prevention Program. Published 2014. Accessed December 18, 2025. https://www.dhs.wisconsin.gov/publications/p00660-7.pdf
8. Wisconsin Department of Health Services. Chapter 8: Medical management of childhood lead poisoning. In: Standards for the Wisconsin Childhood Lead Poisoning Prevention Program. Published 2014. Accessed December 18, 2025. https://www.dhs.wisconsin.gov/publications/p00660-8.pdf
9. Wisconsin Department of Health Services. Wisconsin 2020 Blood Lead Testing Data for Children Less Than 6 Years Old by Local Health Department. Published 2022. Accessed December 18, 2025. https://www.dhs.wisconsin.gov/publications/p00817-2020-local.pdf

Appendices

Appendix One: Table of Confirmatory Venous & Follow-Up Labs Timeline

(Center for Disease Control and Prevention, 2022) https://www.cdc.gov/nceh/lead/advisory/acclpp/actions-blls.htm#anchor_1647349462703

***Provider discretion mentioned below should be based on the rate of change in elevated blood lead levels as well as social factors such as housing stability and barriers to follow-up.**

If venous result ever increases to a new level; complete full set of confirmatory venous labs in the new result range

POCT result	Immediate Order (confirmatory venous and additional studies)	Two Serial Labs (trend establishment)	Ongoing Follow-Up (if trend is stable* or decreasing)
< 3.5 µg/dL	Continue routine POCT	n/a	Continue routine POCT
3.5 – 9.9 µg/dL	Venous blood lead	Follow-Up EBLL and Subsequent serial venous blood lead and (or CBC without diff for patients with history of anemia) every 1-3 months after initial confirmatory venous, per provider discretion*	Stable: Venous blood lead and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3 months until downward trend Decreasing: Once trending down, every 6- 9 months, per provider discretion*, until <3.5 µg/dL
10 – 14.9 µg/dL	Venous blood lead, Ferritin, and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) Consider XR abdomen based on clinical judgment (caregiver report of eating paint chips, history of pica, etc.)	One month after confirmatory venous: If confirmatory venous blood lead 10 - 14.9 µg/dL; venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) AND Subsequent serial venous blood lead and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) every 1-3 months after confirmatory venous, per provider discretion*	Stable: Venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3 months until downward trend Decreasing: Once trending down, venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3-6 months, per provider discretion*, until <10 µg/dL. Once < 10 µg/dL, follow decreasing follow-up lab recommendation in 3.5 – 9.9 µg/dL category

15 – 19.9 µg/dL	Venous blood lead, Ferritin, and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) Consider XR abdomen based on clinical judgment (caregiver report of eating paint chips, history of pica, etc.)	<u>One month after confirmatory venous</u>: If confirmatory venous BLL 15 – 19.9 µg/dL; venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) AND <u>Subsequent serial</u> venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) every 1-3 months after confirmatory venous, per provider discretion*	<u>Stable:</u> Venous blood lead and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3 months until downward trend <u>Decreasing:</u> Once trending down, venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 3-6 months, per provider discretion*, until <10 µg/dL. Once < 10 µg/dL, follow decreasing follow-up lab recommendation in 3.5 – 9.9 µg/dL category
20 – 44.9 µg/dL	Venous blood lead, Ferritin, and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) XR abdomen	<u>Two weeks after confirmatory venous</u>: If confirmatory venous BLL 20 – 44.9 µg/dL; venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) AND <u>Subsequent serial</u> venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) every 2 weeks - 1 month after confirmatory venous, per provider discretion*	<u>Stable:</u> Venous BLL and H/H q 1 month until downward trend <u>Decreasing:</u> Once trending down, venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) q 1-3 months, per provider discretion*, until <10 µg/dL. Once < 10 µg/dL, follow decreasing follow-up lab recommendation in 3.5 – 9.9 µg/dL category
45 – 69.9 µg/dL	This is considered a critical result. Repeat POCT to validate result	Consult Medical Toxicology / Poison	Consult Medical Toxicology / Poison Center for plan of care if chelating

	in-clinic after thorough hand-washing of patient STAT venous blood lead level, Ferritin, H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin), BUN, Creatinine, AST/ALT, UA (urine dip in-clinic) *Page Lab Managers (414-907-8200) to FYI of highly elevated results and need for same-day venous BLL results XR abdomen	Center for plan of care regarding chelation If not chelating – 2 weeks after confirmatory venous: Venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) AND Subsequent serial venous BLL and H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin) every 2 weeks - 1 month after initial EBLL, per provider discretion*	Refer to Appendix Two for Post-Chelation Recommended Plan of Care
≥ 70 µg/dL	This is considered a critical result. Repeat POCT to validate result in-clinic after thorough hand-washing of patient STAT venous blood lead level, Ferritin, H/H (or CBC without diff for patients with history of anemia or diagnosis of low hemoglobin), BUN, Creatinine, AST/ALT, UA (urine dip in-clinic) *Page Lab Managers (414-907-8200) to FYI of highly elevated results and need for same-day venous BLL results XR abdomen	Consult Medical Toxicology / Poison Center for plan of care – admission for monitoring and chelation initiation is required	Consult Medical Toxicology / Poison Center for plan of care Refer to Appendix Two for Post-Chelation Recommended Plan of Care

Appendix Two: During Chelation and Post - Chelation Plan of Care Recommendations

Post-chelation plan of care should be developed in partnership with Medical Toxicology or the Poison Center of Wisconsin. The lab draws and frequency described below reflect the typical plan of care. Refer to the progress note or discharge note if child was hospitalized from the child's PCP or Medical Toxicology that details the patient's specific plan of care.

Please note, the Lead Nurse Care Manager with the Centralized Lead Care Management Team will support families in adherence to this plan of care through collaboration with the PCP and care-coordination for CMG patients who reside in the City of Milwaukee. Please ensure a referral to AMB REFERRAL TO CARE NAVIGATION has been placed and enter a comment that this is for post-chelation support to the referral.

During Chelation and Post-Chelation Lab Frequency:

Timing	Labs
Two weeks post-chelation	Venous blood lead level and CBC without differential
Four weeks post-chelation	Venous blood lead level and CBC without differential
Monthly until downward trend established	Venous blood lead level and CBC without differential
Once downward trend is established	Return to appropriate Venous level labs

Appendix Three: GI clean out for children with lead poisoning

Purpose- utilize rectal and oral medications to decrease the need for inpatient clean out for specific type of patients to optimize care and improve outcomes in a safe and effective way. Framework is Patient-Centered Care optimizing the best and safest care at Children's Wisconsin.

1. Age, development, social situation
2. Area of the GI track the lead is seen on KUB

Steps to take	Children <2 years	Children 2-4 years of age	Children 5 to 11 years of age	Children 12 and up
Step 1 Rectal medication (First one given in clinic by staff in the presence of positive history of pica or in the EDTC with positive KUB)	Glycerin suppository (liquid or ½ solid suppository) in rectum once (Liquid is 2.7 mL) Repeat Day 2 if no stool by mid-day on second day	One half (33 ml) Pediatric Fleet saline enema Alternative - Or Pediatric Glycerin suppository liquid or solid Repeat Day 2 if no stool by mid-day on second day	One (66 ml) Pediatric Fleet saline enema in rectum once Alternative – Children 7 years and older Bisacodyl 10 mg suppository in rectum once Repeat Day 2 if no stool by mid-day on second day	One (133 ml) Adult Fleet enema in rectum once Alternative – Bisacodyl 10 mg suppository in rectum once Repeat Day 2 if no stool by mid-day on second day
Step 2 Start a stool softener + stimulant laxative	Miralax 1.5g/kg/day by mouth in divided in 2 doses a day for 3 days + Senna Syrup 8.8mg/5mL 1 tsp by mouth twice daily for 3 days OR	Miralax 1.5g/kg/day by mouth in divided in 2 doses a day for 3 days + Ex-Lax – 1 Ex-Lax square (15 mg) by mouth 2 times a day for 3 days	Miralax 7 caps + 32 oz Gatorade. Drink over 4-8 hours (faster is better) + Ex-Lax – 1 Ex-Lax square (15 mg) by mouth 2 times a day for 3 days	Miralax 14 caps + 64 oz Gatorade. Drink over 4 hours (faster is better) + Ex-Lax – 1 Ex-Lax square (15 mg) by mouth 2 times a day for 3 days

	Ex-Lax – ½-1 Ex-Lax square by mouth 2 times a day			
Step 3	Repeat KUB day 3 If still lead seen in colon or rectum, repeat steps 1-2	Repeat KUB day 3 If still lead seen in colon or rectum, repeat steps 1-2	Repeat KUB day 3 If still lead seen in colon or rectum, repeat steps 1-2	Repeat KUB day 3 If still lead seen in colon or rectum, repeat steps 1-2

Tabbers, M. M., DiLorenzo, C., Berger, M.Y., Faure, C., Langendam, M. W., Nurko, S., Staiano, A.,Vandenplas, & Benninga, M. A. (2016). Evaluation and treatment of Functional Constipation in Infant and Children: evidence-based recommendations from ESPGHAN and NASPGHAN. Journal of Pediatric Gastroeterology and Nutrition, 58(2). DOI: **10.1097/MPG.0000000000000266**

Pasick, L. J. & Imboden, E. M. (2019). Child with punctate opacities in the colon. *Contemporary Pediatrics Journa*l (36), 4. Retrieved from Child with punctate opacities in the colon | Contemporary Pediatrics

1. Note that in some cases if a second clean out is required, consider continuing the MiraLAX for a full 7 days (on a case by case basis)

   OR

2. Consult a Pediatric GI specialist for any concerning cases where the lead is not clearing the colon or rectum after the 2nd treatment/cleanout attempt.

Ankur Chugh, MD and Denise Kilway, DNP, RN, CPNP 2/16/2023

Appendix Four: CW Lab & CMG Result & Reporting Workflows

Children's lab and Children's Medical Group staff have established workflows to ensure timely reporting of all lead results to Wisconsin Department of Health Services (DHS), per Wisconsin state law (Wisconsin Department of Health Services, 2014).

Children's Medical Group Blood Lead Lab Reporting Workflow:

- Health Care Providers and labs are required to report all blood lead test results to the Department of Health Services in a given amount of time depending on the result.

Timetable for Reporting	
Blood Lead Result (micrograms/deciliter)	*Report Sent Within*
45 or more	24 hours
3.5 – 44	48 hours
0 – less than 3.5	10 days

- Results will be uploaded to the Wisconsin State Laboratory of Hygiene Monday-Friday by the Clinical Practice Team. Normal results do not need to be faxed or sent via Epic.
- If you have a result of 3.5 or more you will need to send the Blood Lead Lab Reporting Form the same day lead was obtained.
- The form can be found in the Communications activity of the Epic Wrap Up Tab (CHW CHPC DHS BLOOD LEAD LAB REPORTING FORM). After the result has been documented in Epic the information will populate this form. ***Fax to 608-267-0402***

CW Lab Blood Lead Reporting Workflow:

CW lab runs leads in house and we dynamically report all results to WEDSS via HL7 interface 24/7/365. We test and report capillary and venous samples CHW lab does NOT do any POCT lead testing.

Wisconsin DHS Blood Lead Reporting Requirements (Wisconsin Department of Health Services, 2014):

Wisconsin statute 254.13 requires that all blood lead test results for Wisconsin residents are reported to DHS following specific timetable, content, and form requirements. Reporting to the state is enabled through a laboratory-based reporting system that works directly with laboratories across the state. Health care providers who utilize the Magellan Lead Care II device for point of care testing results are also required to report results to the state. Health care providers are expected to include demographic information with results to ensure the state laboratory can report results down to the appropriate local health department jurisdiction.

Appendix Five: Testing Information – Capillary/Venous & POCT

Capillary sampling:

For information on the best-practice methods for capillary screening tests, refer to Schlenker, et al., 1994:

Method 1 used wiping the finger to be punctured with an alcohol wipe and allowing it to dry.

Method 2 used wiping the finger to be punctured with an alcohol wipe, allowing it to dry, and spraying on silicone coating.

Method 3 used washing the child's hands with soap and water, rinsing and drying, and wiping the finger to be punctured with an alcohol wipe.

Method 4 (used during home visits) used washing the child's hands with soap and water, rinsing and drying, wiping the finger to be punctured with an alcohol wipe, and rinsing with 1% nitric acid solution

> "Among the different capillary sampling methods, the two that required hand washing with soap and water were marginally better at eliminating skin contamination. Nevertheless, where hand washing with soap and water was too cumbersome, methods using only alcohol wiping performed well. The use of silicone-spray skin coating or a dilute nitric acid wash following alcohol wiping appeared to confer no additional benefit. The higher false-negative rate of method 4 (8%) may have been due to hemodilution from excessive fingertip squeezing caused by technician inexperience, as has been reported elsewhere."

Venous as gold-standard for any detected elevated blood lead level:

For information on why venous blood lead testing is the gold standard when an elevated capillary level is detected upon screening and for ongoing monitoring, see Advisory Committee on Childhood Lead Poisoning Prevention, 2012. Specifically, pages 27-28.

> "Pediatricians should explain the uncertainty of all quantitative medical tests and BLL testing. In particular, testing capillary blood for lead may be affected by residual lead contamination ingrained on children's fingers, and that can be very difficult to remove. Even in the best laboratories, variations in test results ± 2 µg/dL are normal and are well within the acceptable lab error. Multiple BLL tests are needed over time to examine true trends in actual blood lead levels."

Links to CMG POCT Lead Testing Competency and Clinical Companion:

Children's Primary Care maintains point of care lead testing competency and clinical companion documents. If interested in reviewing, please reach out to the clinical practice team directly.

Lead Care Management

Clinical Guideline

Revision date: 01/20/2026

Approved by the authors below and Dr. Paradis, Medical Director of the Lead Program

Authors & Departments

Department	Name Credentials
Health Management, Owner	Anastasia Brennan, MSN, MPH, RN
Health Management	Heather Paradis, MD, MPH
Children's Primary Care	Chris Schwake, MD
Medical Toxicology & Wisconsin Poison Center	Jillian Theobald, MD, PhD, FAACT
City of Milwaukee Health Department | Home Environmental Health	Holly Nannis, BSN, RN, PHN
City of Milwaukee Health Department | Home Environmental Health	Emily DeLeo, MPA, RN

Version History and Summary of Changes:

- Version 1.0 (2/27/2023): Go-Live
- Version 1.1 (5/22/2023): Added Appendix 4 – GI clean-out for children with lead poisoning; updated lab orders to include CBC without differential for children with history of anemia, updated local health department environmental inspection timeline for 45-69.9 µg/dL section; updated links
- Version 1.2 (8/17/2023): Revised Appendix 2: Post-chelation plan of care recommendations; updated content re: venous level reported as >55.5 µg/dL by Children's Lab; updated local health department contact information for POCT ≥45 µg/dL and ≥70 µg/dL; formatting updates
- Version 1.3 (5/2/2024): Incorporated new WI DHS Blood Lead Testing Recommendations; updated content re: referrals to CW Care Navigation Lead Program; updated education resources content
- Version 1.4 (01/20/2026): Alignment with updated Poison Center Guidelines – removal of ZPP and CRP from labs. Removal of criteria age >6 years for ongoing lab monitoring – goal is to follow children until their venous lead level is <3.5 µg/dL

Please contact clinicalguidelines@childrenswi.org for questions or comments.

Medical Disclaimer

This Clinical Guideline (CG) is designed to provide a framework for evaluation and treatment. It is not intended to establish a protocol for all patients with this condition, nor is it intended to replace a clinician's judgement. Adherence to this CG is voluntary. Decisions to adopt recommendations from this CG must be made by the clinician in light of available resources and the individual circumstances of the patient. Medicine is a dynamic science; as research and clinical experience enhance and inform the practice of medicine, changes in treatment protocols and drug therapies are required. The authors have checked with sources believed to be reliable in their effort to provide information that is complete and generally in accord with standards accepted at the time of publication. However, because of the possibility of human error and changes in medical science, neither the authors nor Children's Hospital and Health System, Inc., nor any other party involved in the preparation of this work warrant that the information contained in this work is in every respect accurate or complete, and they are not responsible for any errors in, omissions from, or results obtained from the use of this information.