DEPARTMENT OF HEALTH

Childhood Blood Lead Case Management Guidelines for Minnesota: Reference Manual

2025 REVISION

Childhood Blood Lead Case Management Guidelines for Minnesota

Guidelines Developed 2001
Revisions: 2006, 2011, 2017, 2025

Minnesota Department of Health
Health Risk Intervention Unit
PO Box 64975
St. Paul, MN 55164-0975
651-201-4620
www.health.state.mn.us

To obtain this information in a different format, call: 651-201-4620.

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Acknowledgements

Funding for the creation of these guidelines was provided by the U.S. Centers for Disease Control and Prevention (CDC) Childhood Lead Poisoning Prevention Grant CDC-RFA-EH171701.

Childhood Blood Lead Case Management Guidelines for Minnesota Revision Workgroup:

- Marsha Allen, East Side Neighborhood Development Company
- Kari Ashby, BSN, PHN, M.Ed., Saint Paul – Ramsey County Public Health
- Barb Carlson, BSN, PHN, Minnesota Local Public Health Association, McLeod County Health and Human Services
- Michael DeMars, RS, Minnesota Environmental Health Association
- Brittny Douglas, REHS, Minnesota Environmental Health Association, Minnesota Department of Health Lead Risk Assessments
- Ryan Fuchs, Minnesota Regional Poison Center
- Kathryn Haugen, MPH, Minnesota Department of Health Lead Poisoning Prevention
- Jennifer Heath, MPH, DNP, RN, Minnesota Department of Health Children Youth Special Health Needs
- Jeff Huotari, MD, Blue Cross Blue Shield of Minnesota
- Dana Janowiak, DNP, RN, PHN, Minnesota Department of Health Children and Youth with Special Health Needs
- Jacqueline Korpics, Region 5 Pediatric Environmental Specialty Unit (PEHSU)
- Teresa Laing, CPNP, APRN, MPH, MA, Minnesota Department of Health, Child and Teen Checkups (C&TC)
- Rebecca Lange, PharmD, DABAT, BCPS Minnesota Regional Poison Center
- Stacy Laurent, Region 5 Pediatric Environmental Specialty Unit (PEHSU)
- Nick Lehnertz, MD, MPH, Minnesota Department of Health - Medical Specialist
- Zeke McKinney, Health Partners, Region 5 Pediatric Environmental Health Specialty Unit (PEHSU)
- Rachelle Menanteau Peleska, MPH, Sustainable Resources Center
- Abby Montague, MD, Children's Minnesota, Minnesota Regional Poison Center
- Shannon Neale, Health Partners, Park Nicollet
- Christy Niemann, BSN, PHN, RNC-MNN, Minnesota Local Public Health Association, Olmsted County Public Health Services
- Carrie Oakland, PharmD, BCPS, CSPI, Minnesota Regional Poison Center
- Travis Olives, MD, MEd, MPH Minnesota Regional Poison Center
- Zoua Pha, Hennepin County Housing and Economic
- Fred Radmer, MPH, Minnesota Department of Health Family Home Visiting
- Zaynab Rezania, MPH, Minnesota Department of Health Lead Poisoning Prevention
- Kris Rhodes, MPH, Minnesota Department of Health, Office of American Indian Health
- Lily Rubenstein, RN, BSN, PHN, Minnesota Department of Health Refugee Health
- Alison Salita, Health Partners, Park Nicollet
- Sandy Sather, RDN, Minnesota Department of Health Special Supplemental Nutrition Program for Women, Infants, & Children (WIC)

- Maria Starchook-Moore, Minnesota Medical Association
- Alexander Vollmer, BS, REHS, Minneapolis Health Department
- Amy Waller, Hennepin County Public Health
- Dorothy Walton, Minnesota Local Public Health Association, Beltrami County Health and Human Services
- Eden Yehdego, MSN, RN, PHN, Minnesota Local Public Health Association, Anoka County Public Health and Environmental Services
- Stephanie Yendell, DVM, MPH, Minnesota Department of Health Lead Poisoning Prevention
- Duzong Yang, MHHSA, Minnesota Department of Health Lead Poisoning Prevention
- Erik Zabel, Minnesota Department of Health, Center for Occupational Health and Safety

These guidelines have been reviewed and approved by:

- Blue Cross and Blue Shield of Minnesota
- Children's Minnesota
- East Side Neighborhood Development Company (ESNDC)
- HealthPartners/ Park Nicollet
- Local Public Health Association of Minnesota (LPHA)
- Minnesota Chapter of the American Academy of Pediatrics (MNAAP)
- Minnesota Medical Association (MMA)
- Minnesota Regional Poison Center
- Region 5 Pediatric Environmental Health Specialty Unit (Region 5 PEHSU)
- Sustainable Resources Center, Inc. (SRC)
- UCare

Executive Summary

Although the toxicity of lead has been known for thousands of years, lead remains one of the most common environmental health threats to children. There are many sources of lead, such as soil contaminated from years of leaded gasoline use, lead dust accidentally brought home from parents' workplaces and hobby areas, lead in plumbing, and some imported products and traditional remedies. However, deteriorated lead paint in homes and lead dust are the main sources of lead exposure for U.S. children today. Children with elevated levels of blood lead during the first years of life may not show symptoms until they enter school and display learning difficulties, reduction in IQ, or behavior problems.

Childhood lead exposure has decreased dramatically since the 1970s due to policy changes and the efforts of parents and professionals across many disciplines. However, lead persists as an environmental contaminant. In Minnesota, 575 children under 6 years of age had confirmed elevated blood lead levels of 5 µg/dL or greater in 2023; 143 more children had elevated capillary results without follow-up venous results.

These guidelines represent a set of best practices and recommendations for case managers working with children exposed to lead. They are based on national recommendations and input from a multi-disciplinary workgroup. These guidelines may be adapted for local use, depending on resources available.

The 2025 revision of these guidelines includes several important updates. CDC now recognizes that there is no safe level of exposure to lead, and in 2021 the blood lead reference value was lowered to 3.5 µg/dL. The Minnesota Statutes 144.9501-144.9512 (also known as the Minnesota Lead Poisoning Prevention Act) (https://www.health.state.mn.us/communities/environment/lead/rules/index.html#statute) have also had updates and changes. In 2023, the definition of an elevated blood lead level was lowered to 3.5 µg/dL and above. A child is now defined as anyone less than 18 years of age; previously a child was defined in MN statute as anyone less than 6 years of age for blood lead case management and follow-up. Environmental risk assessments are also now required for children less than 18 years of age with blood lead levels of 5.0 µg/dL or greater on a venous sample; risk assessments were previously only required for children less than 6 years of age with blood lead levels of 15.0 µg/dL or greater on a venous sample. These guidelines are now consistent with the updated elevated blood lead level definition, other statute changes, and other guidelines. The guidelines were also edited to improve clarity and provide case managers with specific resources to which they can refer families.

Purpose of Case Management Guidelines

The Childhood Blood Lead Case Management Guidelines are for the case management, health education, risk assessment, and follow-up of children with elevated blood lead levels. These guidelines represent a set of best practices and recommendations for local public health case managers and other staff working with children exposed to lead. Case managers, public health nurses, health educators, community health workers, risk assessors, and other public health professionals who work with individuals who have received an elevated blood lead test result may find these guidelines helpful. Case managers may work in a city or county local public health department (LPH), in a Community Health Board (CHB) representing multiple counties, or in Tribal public health department (TPH). Other guidelines regarding blood lead screening/ testing and treatment for children and screening and treatment for pregnant and breastfeeding women may be found at the Minnesota Department of Health (MDH) Blood Lead Level Guidelines (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html).

Blood Lead Tests

Levels of lead in the body are determined through a blood lead test. Blood lead test results are measured in micrograms of lead per deciliter of blood (µg/dL or mcg/dL). Blood lead tests can be done with either capillary or venous samples.

Blood lead tests on capillary samples are often used for screening. The blood is drawn from a finger or a heel prick for analysis. Often blood lead tests on capillary samples are more acceptable to parents and guardians, as they are less invasive than venous blood draws. Blood lead tests in capillary samples also may be able to be performed in settings that that do not have the capacity for blood lead draws and may be able to be analyzed during the appointment rather than having to wait for results to come back from a lab.

Blood lead tests on capillary samples are a useful tool for screening, but they are prone to false positive results and thus are considered unconfirmed results. A study by Wang et al.[1] found that about 60% of elevated capillary tests are false positives. Due to the high false positive rate of capillary samples, Minnesota state statute requires an environmental risk assessment for children with a confirmatory blood lead test result on a venous sample $\geq$ 5 µg/dL, but not for children with only unconfirmed capillary results. Therefore, it is important to confirm elevated capillary results with blood lead tests on venous samples. Elevated Blood Lead Levels (EBLLs) on capillary samples should be confirmed with a venous sample according to the timelines on page 17; the sooner elevated capillary results can be confirmed, the better.

Blood lead tests on venous samples are drawn from a vein with a needle and are considered confirmed results. They are highly accurate and usually used for confirming elevated capillary results or for doing follow-up blood lead tests once an individual has a confirmed EBLL. However, blood lead tests on venous samples may also be used as initial blood lead tests. In

[1] Wang A, Rezania Z, Haugen KMB, Baertlein L, Yendell SJ. Screening for elevated blood lead levels: False-positive rates of tests on capillary samples, Minnesota, 2011-2017. *JPHMP.* 2019;25(1): S44-S50. doi:10.1097/PHH.0000000000879

some cases, it might make sense to do a blood lead test on a venous sample right away instead of a capillary sample: when a blood draw is already being done for another reason, when it might be difficult to get a patient back into a clinic for a venous follow-up, or when a patient is suspected of already having an EBLL (like when a household member has already had an EBLL).

Information about procedures for taking and reporting blood lead tests, determining whether a capillary or venous sample is more appropriate, targeted versus universal screening, blood lead reference value, and importance of blood lead testing at both 12 and 24 months of age are available in the Minnesota Childhood Blood Lead Screening Guidelines: Reference Manual (www.health.state.mn.us/communities/environment/lead/docs/leadscreenref.pdf).

Role of the Case Manager

Recommended Areas of Knowledge and Training

1. Case management
2. Nutrition and hygiene
3. Growth and development
4. Physiology and adverse effects of elevated blood lead levels
5. Clinical standards and outcomes for elevated blood lead level prevention and treatment
6. Environmental sources of lead and lead hazard reduction methods
7. Referral services and resources in the community and state

Recommended Qualifications

MDH recommends that the case manager be a professional with case management and lead training or experience. Recommended qualifications for a case manager are below.

- If possible, the case manager should be a public health nurse (PHN) with a four-year nursing degree.
- If a PHN is not available, the case manager should be a health professional (e.g., a health educator or a registered nurse (RN) without a bachelor's degree).
- If neither a PHN nor a health professional is available, the case manager can be any professional with a health-related degree (e.g., a social worker or risk assessor).

For case manager training information, contact MDH for training information at 651-201-4892.

Role Definition

The role of the case manager is to work with clients by assessing, facilitating, planning, and serving as an advocate for their health needs on an individual basis.

Case management is expected to achieve measurable results in terms of decreasing exposure, decreasing blood lead levels, and improving the health of children and their families, particularly young siblings. Case management programs are expected to measure and report relevant program outcomes. Program outcomes may include reduced blood lead levels and

reductions in environmental lead hazards. Lead hazard reduction may involve interventions ranging from cleaning and lead hazard control to emergency relocation.

Communication with the case management team is critical for effective case management, Team players include, but are not limited to:

- Case manager
- Family
- Medical providers
- Licensed lead risk assessors and licensed risk assessing agencies
- Paraprofessional home visitors
- Local funding sources
- Medical, nutritional, developmental/behavioral, housing, and other agencies
- Other community sources

The ability to work collaboratively with various outside groups and organizations to reach common goals is essential.

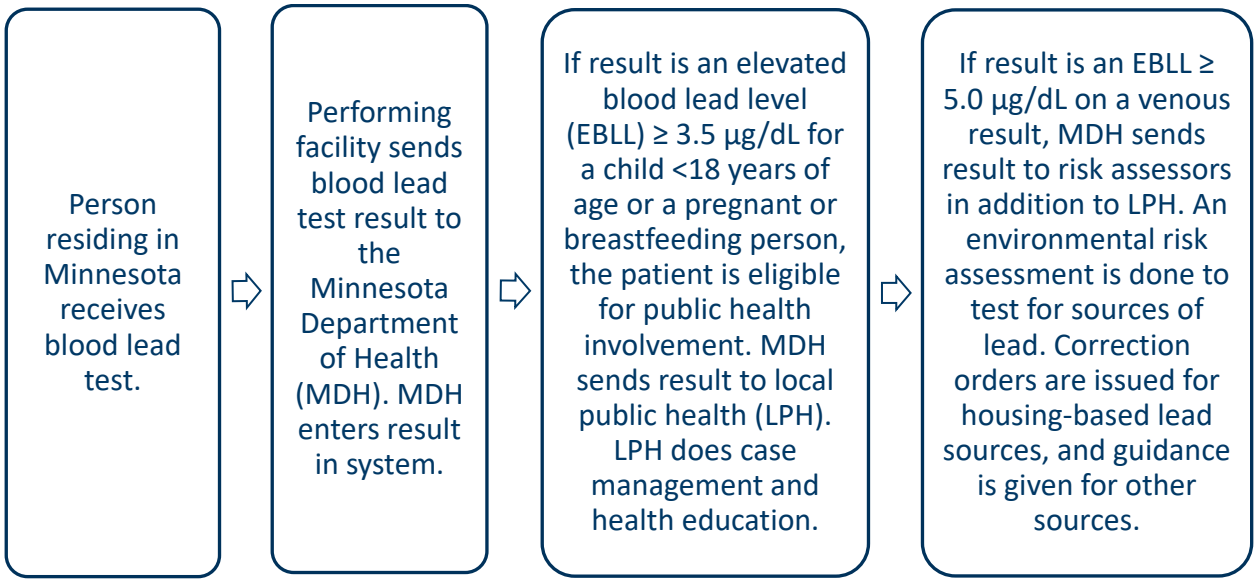
Public Health Process and Roles

Public Health Services

For children, an elevated blood lead level greater than or equal to 3.5 µg/dL will automatically trigger involvement from local public health. For individuals who receive services through a Tribe, services may be provided by Tribal public health rather than local public health.

An elevated blood lead level on a venous result greater than or equal to 5.0 µg/dL in a child will also ensure an environmental investigation (risk assessment). Environmental risk assessments may be performed for children with blood lead levels of 3.5 µg/dL or greater on a venous result if the assessing agency has the resources and chooses to do risk assessments for venous levels 3.5 – 4.9 µg/dL. At this time, risk assessing agencies in Minnesota are only planning to do risk assessments for children with blood lead levels at or above 5.0 µg/dL on a venous result. *Figure 1: Process and Role of Public Health* on page 10 outlines the process for public health services.

Figure 1: Process and Role of Public Health



* For individuals who receive services through a Tribe, services may be provided by Tribal public health rather than local public health.

Case Management

When the Minnesota Department of Health receives an elevated blood lead level for a child under 18 years of age, it is sent out to the relevant local public health department. See *Figure 1* for the public health process. Depending on the location, this may be the city or county public health department or the Community Health Board serving that county. For individuals who receive services through a Tribe, services may be provided by Tribal public health rather than local public health. A staff member from that local public health department, usually a public health nurse, will provide health education and case management for the family. Depending on the local public health department's resources and the child's blood lead level, case management may include sending a letter with educational materials, calling the family, doing a home visit, or a combination of these services. If an environmental risk assessment is performed, the public health nurse may conduct a home visit in conjunction with the risk assessment.

Home Visit Protocol for Case Managers

Purpose

The purposes of a home visit are to:

1. Stop further lead exposure to children with elevated blood lead levels and others in the home environment, and
2. Increase the knowledge of those in the home about the nature of an elevated blood lead level and how to resolve it.

Steps

HOME VISITS SHOULD BE CONDUCTED IN THE PREFERRED LANGUAGE OF THE FAMILY. USE AN INTERPRETER IF NECESSARY.

- Conduct an educational encounter using appropriate educational materials. This is best done in the home of the child with an elevated blood lead level. However, it may be completed through a telephone call for children with lower elevated blood lead levels. The following materials are suggested and can be ordered from MDH in several languages or can be accessed from MDH Fact Sheets and Brochures: Lead Poisoning Prevention (https://www.health.state.mn.us/communities/environment/lead/fs/index.html).
  - Childhood Lead Exposure: Are Your Kids at Risk?
  - Common Sources of Lead
  - Steps to Help Lower Your Child's Blood Lead Level
  - Protect Children from Lead with Healthy Foods
  - Cleaning Up Lead Dust in Your Home or Simplified Cleaning Up Lead Dust in Your Home
  - Lead in Imported Products
  - Take-Home Lead: A Preventable Risk for Your Family
- Opening statements should explain the following:
  - Case management
  - Role of the case manager
  - Tennessen statement utilized by your jurisdiction
  - Verbal or signed release of information statement to permit the case manager to discuss the case with all involved in the resolution of the lead case

Sample Role Explanation

> *"Due to your child's elevated blood lead level, I will be helping you manage their lead level and the circumstances which have possibly contributed to the lead level. We will work together to ensure your child's blood lead level is reduced and the exposures to lead are eliminated."*

The case manager may utilize a form to assess potential needs and document education provided during the home visit. An example of a form is available upon request. They will assess the family's educational needs and deliver appropriate informational brochures as well as hands-on teaching as needed. It is recommended that the case manager utilize the MDH Lead Educational Materials (www.health.state.mn.us/communities/environment/lead/edumat.html).

- If a risk assessor is not present:
  - Conduct a cursory evaluation of the home, including the age of the home and both interior and exterior (gardens, barns, fences, neighborhood) for environmental sources of lead.
  - Ask if the child spends significant time at other locations such as other family members' homes or daycares.
  - Ask the family about potential sources of lead, including housing and non-housing sources of lead such as jobs/hobbies, spices, cosmetics, cookware, travel, etc.

Potential sources of lead are identified starting on page 28 of this manual.
    - Alert the family regarding the potential hazards of lead reduction work and provide them with information on lead-safe work practices. Encourage the family to have the work done by a lead professional and require children and pregnant or breastfeeding women to vacate the premises during the work process.
- Share information for the purposes of case management and case closure with:
    - Primary care provider
    - Lead risk assessor
- Develop a care plan and assess the need for more visits after the initial assessment. At least one follow-up home visit is recommended, or more if indicated. Orders from the primary care provider should be obtained if needed according to your agency policy, the level of nursing intervention provided, and the pay source utilized.
- Coordinate blood lead testing of other household members who are likely exposed to lead source(s) or recommend they contact their primary health care provider for blood lead testing.
    - For housing-based sources, exposed individuals are typically less than 72 months of age.
    - For non-housing-based sources, household members of all ages may be exposed.
- Refer the family to needed services. See Referral Services section on page 22.

Environmental Investigations (Risk Assessments)

According to Minnesota Statutes 144.9504 (https://www.revisor.mn.gov/statutes/cite/144.9504):

- An environmental risk assessment must be performed for any child under 18 years of age or pregnant/breastfeeding person with a venous blood lead level of at least 5.0 µg/dL.
    - An environmental risk assessment can be performed for any child under 18 years of age or pregnant/breastfeeding person with any elevated blood lead level on a venous result, as risk assessment agency resources allow.
- Environmental risk assessments can be performed at the primary residence, residential or commercial childcare facility, playgrounds, schools, or other locations where the child spends more than a few hours a week.
    - Under some circumstances, risk assessments can also be performed at residences where the child no longer lives.
- Risk assessments can also be done at other locations where lead hazards are suspected in addition to homes, childcare facilities, playgrounds, and schools.
    - If another location outside of the home is the original source of lead exposure, the assessing agency may order the responsible person of that location to perform lead hazard reduction and remediate the conditions that allow the lead hazard to migrate from the source location to the home.
    - An assessing agency may refer investigations at sites other than the child's or pregnant person's residence to the MDH commissioner for follow up.
- Environmental risk assessments are to be completed within the following timelines from when the Minnesota Department of Health is notified of a venous blood lead level for a child under 18 years of age or a pregnant/breastfeeding person:

  - Within 48 hours for a venous blood lead level (BLL) of 60 µg/dL or greater
  - Within 5 working days for a venous BLL of 45.0 – 59.9 µg/dL
  - Within 10 working days for a venous BLL of 10.0 – 44.9 µg/dL
  - Within 20 working days for a venous BLL of 5.0 – 9.9 µg/dL.
- Following a risk assessment by a licensed lead risk assessor, lead correction orders can be issued to the property owner to address lead hazards. Property owners have 60 days to address lead hazards identified in the correction orders.
  - If an environmental risk assessment is performed, it is the responsibility of the licensed risk assessor to follow the property until it passes clearance inspection. In order to pass clearance inspection, the affected property must have no deteriorated lead paint and no bare soil or lead dust exceeding soil or dust standards.

There are two key players when an environmental case is open at the child's primary residence.

- The Case Manager is responsible for determining when to close the case of the child, medically or administratively.
- The Licensed Lead Risk Assessor is responsible for determining when to close the case of the property.

A steady line of communication must be maintained between the licensed lead risk assessor and the case manager. Although the case manager does not have any direct responsibility for the environmental case, it is important for the case manager to be aware of the status of the property. The medical and environmental cases may be closed at different times.

Swab Team Services

According to Minnesota Statutes 144.9504, Subdivision 6 (https://www.revisor.mn.gov/statutes/cite/144.9504) services of a swab team may be offered free of charge to the property owner after a lead risk assessment is performed. Swab team services may be limited in availability. Swab team services are activities that provide protection from lead hazards primarily through interim controls, including:

- Removing lead dust by washing, vacuuming with high efficiency particle accumulator (HEPA) or wet vacuum cleaners, and cleaning the interior of residential property
- Removing loose paint and paint chips, and repainting or installing guards to protect intact paint
- Covering or replacing bare soil that has a lead concentration of ≥ 100 parts per million
- Health education.

Swab team services address immediate lead hazards through interim controls; they are not designed to address long-term lead hazards within the property. More information about the Swab Team Services grant and current grantees are listed on MDH Swab Team Services Grant (www.health.state.mn.us/communities/environment/lead/prof/swabgrant.html).

Public Health Communication with Health Care and MN Statute

Minnesota Statutes 144.9502, Subdivision 9 (www.revisor.mn.gov/statutes/cite/144.9502), along with Minnesota Statues 145A.04, Subdivision 1 (www.revisor.mn.gov/statutes/cite/145A.04), grants local boards of health the authority to enforce the laws identified in these statutes and utilize blood lead data to monitor blood lead levels, ensure screening services are provided to high-risk populations, ensure the provision of medical and environmental follow-up, and conduct primary prevention. Based on these statutes, health care providers may share information about patients that have received a blood lead test with the relevant local public health department, Community Health Board, or Tribal health department as well as the Minnesota Department of Health. The ability of local public health departments to obtain and utilize blood lead analysis data and the associated epidemiologic data is crucial for fulfilling the responsibilities of an assessing agency under Minnesota Statutes 144.9504 and protecting and promoting the health of Minnesota residents.

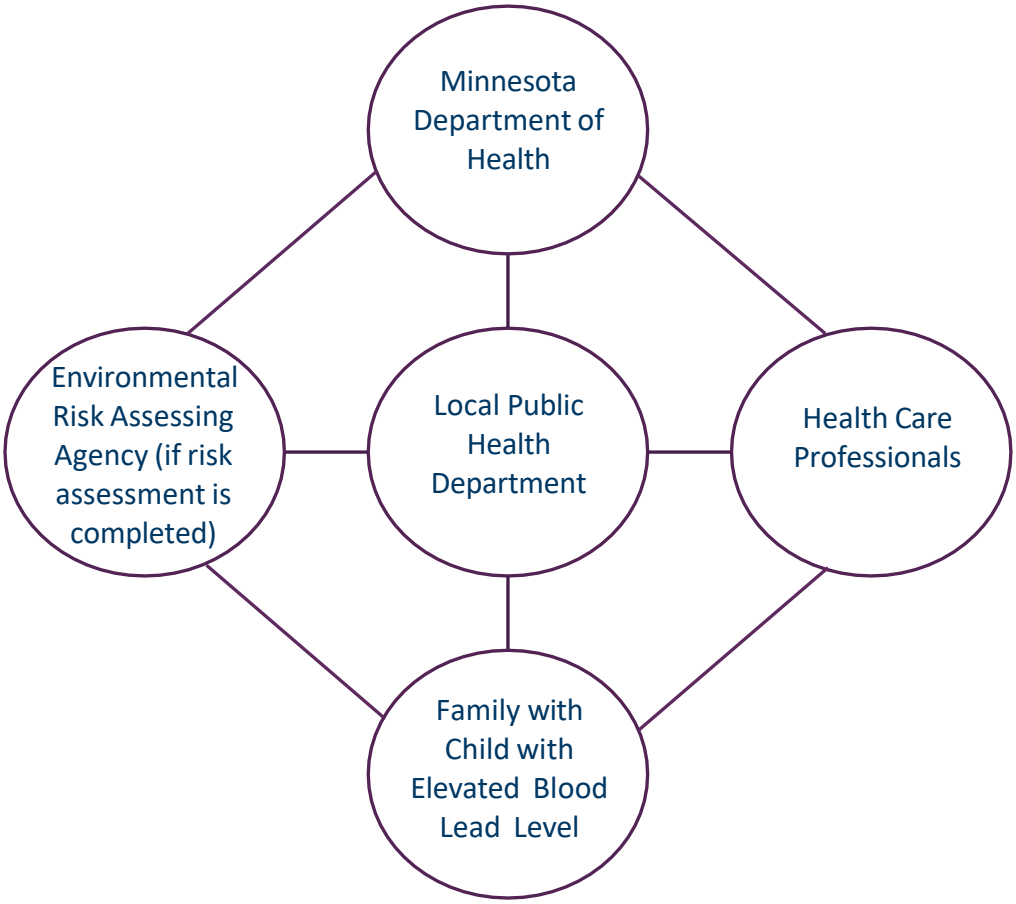
Public health lead case managers may find it helpful to share this statute information with clinics or health care providers if they encounter difficulty getting information about patients with elevated blood lead levels in their jurisdiction. If local public health still has difficulty, they may reach out to the Minnesota Department of Health for assistance.

Technical Assistance and Communication

The Minnesota Department of Health offers guidance and answers questions from health care providers and local public health departments regarding blood lead testing and elevated blood lead case management. If local public health departments have questions about medical treatment or environmental risk assessments or have information to share that may be relevant to addressing the lead exposure, they are encouraged to contact the Minnesota Department of Health or the relevant health care provider. Staff at the Minnesota Department of Health typically work standard business hours and will respond to messages as soon as they are able.

Figure 2 shows the common communication pathways among health care professionals, public health, environmental risk assessors, and families. Local public health departments often have the most direct contact with families and have the most information about sources of lead and other factors that may be contributing to a child's blood lead level. The Minnesota Department of Health may have information regarding sources of lead identified in environmental risk assessments and notes from health care professionals and can share relevant information or questions from local public health with health care professionals or environmental risk assessors.

Figure 2: Communication Pathways



Case Closure

The objective of the case management process is to assure that both the medical treatment of the lead-poisoned child is accomplished and the environmental exposure routes are addressed. Case managers can close cases even if the environmental risk assessor is still working on the environmental aspects of the case, based on the criteria below.

- Medical closure
  - Based on the blood lead level of the child
  - Defined as one capillary or venous blood lead level less than 3.5 µg/dL
- Administrative closure
  - Indicates that the child can no longer be followed
  - Circumstances when an administrative closure can be done include:
    - The child is greater than 18 years of age and is not pregnant or breastfeeding.
    - The child is lost to follow-up after three varied attempts to locate (see below).
    - The child has moved out of the health jurisdiction. Inform MDH of new address when possible so the case can be transferred with the new jurisdiction.
    - The parent has refused services and has been given information about elevated blood lead levels and lead hazard control.

- The case manager is concerned for their personal safety when following up with the family. Appropriate referrals should be made.
- The blood lead level has been decreasing appropriately. Steps are being taken to address lead exposure routes. Resources do not allow active follow-up with the child.
- The blood lead level has been decreasing appropriately, and the health care provider has decided to no longer do follow-up blood lead tests.

Suggested Methods to Contact Family

Three varied attempts at contact in the family's preferred language should be made before closing the case for loss to follow-up. Methods may include the following:

Methods using Existing Contact Information	Methods to Verify or Update Contact Information
▪ Call ▪ Leave a voicemail ▪ Send a letter ▪ Send a certified letter ▪ Make a home visit ▪ Text or email (follow agency policies; may require prior consent)	▪ Inquire with the primary care provider to verify or update contact information or see if they can leave a message in the patient's chart or online portal ▪ Inquire with the WIC contact ▪ Inquire with the economic assistance contact ▪ Inquire with the child protection contact ▪ Inquire with the US Postal Service for a forwarding address ▪ Inquire with the contact person listed at admission ▪ Inquire with the health plan

Childhood Blood Lead Case Management Guidelines for Minnesota

Case Management Guidelines: Blood Lead Tests on Capillary Samples

BLLs (µg/dL)	ACTIONS BASED ON RESULTS OF BLOOD LEAD TESTS ON CAPILLARY SAMPLES
Capillary < 3.5	▪ No local public health (LPH) outreach necessary. LPH should provide lead prevention education if questions arise.

Capillary ≥ 3.5	Perform the following within 1 week, or sooner for higher blood lead levels:
	▪ Contact the family with the recommendation for venous confirmation within:
	  ▪ 1 month for Blood Lead Levels (BLLs) 3.5–9.9 µg/dL
	  ▪ 1 week for BLLs 10.0–44.9 µg/dL
	  ▪ 48 hours for BLLs 45.0–59.0 µg/dL
	  ▪ Immediately for BLLs ≥ 60 µg/dL.
	▪ If feasible, contact the medical care provider regarding venous confirmation, especially for higher blood lead levels.
	  ▪ Offer the medical care provider MDH's screening & treatment guidelines (link under "Resources") if needed.
	  ▪ If a clinic is unable to do a venous draw, they should refer the child to a lab or facility able to perform a venous draw.
	▪ Venous confirmation is required for an environmental risk assessment (an environmental inspection).

Case Management Guidelines: Blood Lead Tests on Venous Samples

BLLs (µg/dL)	ACTIONS BASED ON RESULTS OF BLOOD LEAD TESTS ON VENOUS SAMPLES
Venous < 3.5	▪ No LPH outreach necessary. LPH should provide lead prevention education if questions arise.

Venous 3.5–4.9	Perform the following within 1 week:
	▪ Provide educational materials to the family. A link to MDH lead fact sheets is listed above under Resources.
	▪ Contact the family with the recommendation for a repeat test on a venous sample every 3 months until BLL < 3.5 µg/dL.
	  ▪ After venous confirmation, venous follow-up tests are preferred due to accuracy, but capillary results are accepted.
	  ▪ Blood lead levels should continue to be monitored until they are less than 3.5 µg/dL.
	  ▪ As resources allow, contact the medical care provider regarding the need for follow-up venous testing if venous follow-up not completed within

BLLs (µg/dL)	ACTIONS BASED ON RESULTS OF BLOOD LEAD TESTS ON VENOUS SAMPLES
	three months. ▪ Communicate with MDH or health care providers regarding follow-up and repeat tests, sources of lead, testing of other household members, or other concerns as needed.
Venous 5.0–9.9	In addition to the steps described above for lower blood lead levels on venous samples, perform the following within 1 week: ▪ Contact the family with the recommendation for a repeat test on a venous sample every 3 months until BLL < 3.5 µg/dL. ▪ Contact the medical care provider regarding the need for follow-up venous testing if venous follow-up not completed within three months. Offer the medical care provider MDH's treatment guidelines if needed. ▪ Complete an assessment of medical, environmental, nutritional, and developmental needs. Make referrals as appropriate. ▪ MDH and/or LPH will attempt to conduct an environmental risk assessment and provide education in the home within 20 working days of receiving the qualifying blood lead level. ▪ Through the risk assessment, the suspected lead sources will be identified. Lead correction orders will be issued for housing-based lead sources, and recommendations will be given for other lead sources. ▪ In collaboration with the assessing agency, LPH must ensure that in-home health education is provided through a home visit and/or risk assessment. ▪ Communicate with the risk assessor assigned to the case to determine whether a home visit will be provided by LPH or whether the risk assessor will be providing home health education. ▪ Home visits and risk assessments should be conducted in the preferred language of the family. LPH and/or the assessing agency should use an interpreter or interpreting service if necessary.
Venous 10.0–44.9	In addition to the steps described above for lower blood lead levels on venous samples, perform the following within 3 business days, or sooner for higher blood lead levels: ▪ Contact the family with the recommendation for a repeat test on a venous sample every 3 months until BLL < 3.5 µg/dL. More frequent monitoring may be recommended for higher blood lead levels. ▪ Contact the medical care provider regarding the need for follow-up venous testing if venous follow-up not completed within three months. ▪ Complete an in-depth assessment of medical, environmental, nutritional, and developmental needs. Make referrals as appropriate. ▪ MDH or LPH will conduct an environmental risk assessment within 10 working days of receiving the qualifying blood lead level. ▪ In collaboration with the assessing agency, LPH must ensure that in-home

BLLs (µg/dL)	ACTIONS BASED ON RESULTS OF BLOOD LEAD TESTS ON VENOUS SAMPLES
	health education is provided though a home visit and/or risk assessment. A home visit by LPH is recommended for these blood lead levels.

Venous 45.0–59.9	In addition to the steps described above for lower blood lead levels on venous samples, perform the following immediately:
	▪ Contact the family with the recommendation for a repeat test on a venous sample as soon as possible. Let the family know the provider should be urgently reaching out to them to schedule additional follow-up.
	▪ At this level the medical care provider should consult with MN Regional Poison Center or Region 5 PEHSU. Chelation treatment may be recommended (see MDH treatment guidelines). More frequent monitoring as well as additional tests and medical follow-up should be expected, including blood lead tests on venous samples 3-6 weeks after chelation therapy is complete.
	  ▪ Contact MDH and the medical provider to determine medical status, treatment, and follow-up plans.
	  ▪ LPH should assist with contacting family and coordinating trips to clinic or hospital for recommended further testing and treatment as soon as possible, as well as follow-up tests after chelation therapy is complete.
	▪ For children with venous blood lead levels of 45.0 µg/dL or greater, an environmental risk assessment will be scheduled within 5 working days.
	  ▪ The LPH case manager should arrange for an initial home visit. If possible, the home visit should happen at the same time as the risk assessment. LPH case manager should communicate with the risk assessor assigned to the case.
	  ▪ Attempt to facilitate alternative, lead-safe housing if available.

Venous ≥ 60.0	In addition to the steps described above for lower blood lead levels on venous samples, perform the following immediately: ▪ TREAT AS AN EMERGENCY— potential encephalopathy. ▪ For children with venous blood lead levels of 60.0 µg/dL or greater, an environmental risk assessment will be scheduled within 48 hours. Additional follow-up should match follow-up for venous levels of 45.0–59.9 µg/dL.

*For individuals who receive services through a Tribe, services may be provided by Tribal public health rather than local public health.

Special Populations

Refugees and Other Newcomer Populations

Refugees are persons who are forced to leave their home country because of disasters, war, or persecution. Refugees who come to Minnesota may be at high risk for lead exposure in their country of origin as well as further exposure from both housing and non-housing sources of lead once they arrive in the United States. The percentage of EBLLs for refugees who receive a blood lead test is ten times higher than the percentage of elevated blood lead levels among Minnesota children in general.

All refugees less than 17 years of age should receive a blood lead test upon arrival in Minnesota according to the CDC Refugee Health Domestic Guidance (www.cdc.gov/immigrant-refugee-health/hcp/domestic-guidance/lead.html) and the Minnesota Refugee Health Provider Guide: Childhood Lead Screening (https://www.health.state.mn.us/communities/rih/guide/9lead.html). In addition, all refugee children less than 72 months of age should receive a blood lead test from their health care provider three to six months after placement in permanent residence, regardless of their initial blood lead level.

Other newcomer populations such as recent immigrants, asylum seekers, migrants, or international adoptees may also be at higher risk of lead exposure from their country of origin. Health care providers should follow the Childhood Blood Lead Screening Guidelines for Minnesota (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html#screening) for blood lead testing for these populations, but may also refer to the refugee health guidance above.

Children receiving Medical Assistance or MinnesotaCare

Children enrolled in Medical Assistance (MA) or MinnesotaCare (MNCare), Minnesota's Medicaid programs, tend to be more than twice as likely to have elevated blood lead levels as non-enrolled children. All health care providers are required to test all children receiving Medical Assistance at 12 and 24 months of age, and all children up to 6 years of age who did not receive a blood lead test at their 24-month checkup. This is a federal Medicaid requirement. For more about this requirement and testing schedule, see below resources:

- Medicaid Lead Screening (https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/lead-screening/index.html)
- Minnesota Department of Human Services: Child & Teen Checkups (C&TC): Blood Lead Test (https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=dhs16_150092#blood)
- MDH Child and Teen Checkups: Lead Testing: Fact Sheet for Primary Care Providers (https://www.health.state.mn.us/docs/people/childrenyouth/ctc/lead.pdf)
- Minnesota Child and Teen Checkup (C&TC) Schedule of Age-Related Screening Standards: (https://edocs.dhs.state.mn.us/lfserver/Public/DHS-3379-ENG)
- American Academy of Pediatrics (AAP) Recommendations for Preventative Pediatric Health Care (https://downloads.aap.org/AAP/PDF/periodicity_schedule.pdf).

Children receiving medical assistance are often eligible for other services either provided or coordinated by local public health departments in addition to lead case management. Coordination and communication are important when multiple services are provided.

Children with Nutritional Needs

Elevated blood lead levels may be associated with nutritional deficiencies, especially iron and calcium deficiency. Local public health should assess children's nutritional status through a conversation with the family about the child's normal diet.

Children with Long-term Elevated Blood Lead Levels

Some children may have elevated blood lead levels for long periods of time. If a trend has been established that the child's blood lead level is decreasing and the sources of lead have been identified, providers may want to decrease the frequency of follow-up blood lead tests from three to six months and/or do follow-up tests on capillary samples. It is recommended that providers discuss this with MDH or the local public health department to ensure lead sources are addressed and there are no other considerations that would mean that more frequent monitoring is recommended. Local public health's knowledge of lead cases will be valuable in decisions regarding the frequency of follow-up blood lead testing for long-term elevated blood lead levels.

Children Needing Chelation

Chelation may be considered for blood lead levels on a venous sample greater than or equal to 45 µg/dL. Research does not show health benefits for chelation for blood lead levels less than 45 µg/dL. When chelation is considered, the Minnesota Regional Poison Center (1-800-222-1222) or the Region 5 Pediatric Environmental Health Specialty Unit (PEHSU) (1-866-967-7337) should be consulted. Either the Minnesota Regional Poison Center or the Region 5 PEHSU will be able to provide guidance on:

- Whether chelation treatment is recommended
- Type of chelation (Succimer or EDTA) and dosage
- Diagnostic tests
- Iron therapy
- Evaluation for and removal of foreign object(s)
- Additional questions

For blood lead levels of 45 µg/dL or greater, blood lead levels should be reconfirmed as soon as possible, even for blood lead test results on venous samples. An abdominal radiograph should be completed to check for any possible foreign objects containing lead. If a swallowed foreign body is seen on the abdominal radiograph, it should be passed or removed prior to chelation. Information regarding blood lead levels, any medical treatments including iron therapy the child is receiving, and foreign objects is important to share with the Minnesota Regional Poison Center or Region 5 Pediatric Environmental Health Specialty Unit for making decisions regarding chelation.

If chelation is recommended by MN Regional Poison Center or Region 5 PEHSU, additional coordination may be needed to ensure its availability. In recent years, there have been shortages of chelation medication across the United States. Health care providers should ensure that the

recommended chelation medication is available at a hospital location before sending the family to that hospital. If there are questions or concerns about availability of the chelation medication, contact MDH as soon as possible so MDH can contact the regional health care coalition to determine the best location to send the patient.

The Minnesota Department of Health should be notified as soon as possible if a child is hospitalized or chelation is begun. This is essential for coordinating care and putting an action plan into place with the Minnesota Department of Health, the local public health department, and the relevant agency performing the environmental risk assessment. Health care providers should discuss possible sources of lead and ways to reduce lead exposure with the family until the source of lead can be addressed. Close communication between health care providers and public health staff is critical for identifying sources of lead and creating an action plan for a lead-safe environment for the child.

Referral Services

A key aspect of the case manager's role is making referrals. The case manager is responsible for placing the family of the child with an elevated blood lead level in contact with services and resources that are available in the local community, or at the state or national level.

The case manager has a unique opportunity to connect with families over the phone or in the home, complete an assessment, and provide assistance to the family. The case manager's role is not limited to assisting with lead exposure prevention. It may also include helping families gain access to resources for addressing other issues.

A wide variety of resources are listed below. Additional resources and links are provided at MDH Lead poisoning Prevention Resources (https://www.health.state.mn.us/communities/environment/lead/links.html). The case manager should become familiar with resources available locally to address the various needs of the family. It may take creativity to meet the specific needs of each family. In cases where no local contact is listed, the case manager should call other agencies or organizations on the list for help obtaining information or resources.

Multi-Resource Sites

- Help Me Connect (https://helpmeconnect.web.health.state.mn.us/HelpMeConnect/)
  - Help Me Connect is a navigator connecting expectant families, families with young children (birth – 8 years old) and those working with families to services in their local communities that support healthy child development and family well-being.
  - It includes information on multiple topics, including healthy development and screening, developmental and behavior concerns, disability services and resources, early learning and childcare, family well-being and mental health, dental and health care, basic needs, legal services, and other resources.
- United Way 211 (https://211unitedway.org/)
  - United Way 2-1-1 provides free and confidential health and human services information for people in Minnesota. Their services are available 24 hours a day, 7 days a week in all languages to connect families to resources and information.

    - They are available at 1-800-543-7709 or 651-291-0211 or via text by texting the local zip code to 898-211*.
    - The 211 website has many resources listed for topics including eviction, childcare providers, education, employment, food, government provided benefits and insurance programs, health care, housing/shelter, individual and family support services, mental health, public assistance programs, temporary financial assistance, transportation, utilities, and other resources.

Medical Resources

- Medical assistance programs
    - Insurance information and free certified assisters for medical assistance enrollment can be found at MNsure (https://www.mnsure.org/).
    - Child and Teen Checkups is the name for Minnesota's Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Program. Child and Teen Checkup visits are available to children receiving medical assistance. Child and Teen Checkups Information for Families (www.health.state.mn.us/people/childrenyouth/ctc/families.html) has information about services available.
- Transportation assistance to medical appointments
    - Transportation assistance may be available through multiple providers, including:
        - Local city or county resources
        - Public transit services
        - Taxis or ride share services
        - Non-profit organizations and volunteer groups
        - Medical/clinic systems
        - Medical insurance
        - DHS Transportation Services - Nonemergency Medical Transportation (NEMT) Services (Overview) (https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=ID_008991) provides reimbursement for rides to medical appointments for individuals receiving Medical Assistance or MinnesotaCare.
- Family home visiting
    - Some families may qualify for family home visiting services to help improve their health and well-being, depending on local resources.

Learning and Development Resources

It is important to remember that children may not show signs of learning difficulties or developmental delays until long after their exposure to lead. Family members and professionals working with families should remain alert to signs of delays so early intervention services can be provided.

- Developmental Assessments
    - It is strongly recommended that the child receive a developmental screening test. The child may be referred to a local community program that administers developmental

screening tests.
    - For advice on specific tests, go to MDH Developmental and Social-Emotional Screening of Young Children (0-5 years of age) in MN (www.health.state.mn.us/people/childrenyouth/ctc/devscreen/index.html)).
- Follow Along
    - The Follow Along Program is a free service that helps track developmental milestones. Parents or local public health can make referrals.
    - Children can be referred at any blood lead level. More information and local contacts can be found at MDH Follow Along Program (www.health.state.mn.us/people/childrenyouth/fap/index.html).
- Help Me Grow
    - Help Me Grow is part of Minnesota's statewide intervention system under the Individuals with Disabilities Education Act.
    - Children with a blood lead level ≥ 45 µg/dL are automatically eligible for Help Me Grow.
    - Children with a blood lead level ≥ 15 µg/dL should be referred for an evaluation to determine eligibility for Help Me Grow.
    - Children with any blood lead level who are showing signs of developmental delays may also be eligible for Help Me Grow.
    - Anyone can make referrals to Help Me Grow, including public health professionals. Referral information can be found at Help Me Grow: How to Refer (http://helpmegrowmn.org/HMG/GetHelpChild/HowRefer/index.html).
- Head Start and Early Head Start
    - Head Start programs promote school readiness of children ages birth to 5 from low-income families by supporting their development in a comprehensive way.
    - More information on local programs can be found through the Minnesota Department of Education: Head Start (http://education.state.mn.us/MDE/fam/elsprog/start/).

Nutritional Resources

- Women Infants and Children Program (WIC)
    - Families who meet income requirements may qualify for nutrition information and nutritious foods.
    - Program eligibility requirements and referral information can be found at MDH: Women, Infants & Children (WIC) Program (http://www.health.state.mn.us/wic/) or at 1-800-WIC-4030 (1-800- 942-4030).
- Food Assistance programs through the MN Department of Human Services
    - Information on the food and assistance programs through the Minnesota Department of Human Services, including SNAP and emergency food services can be found at MN Department of Human Services: Supplemental Nutrition Assistance Program (SNAP) (mn.gov/dhs/people-we-serve/children-and-families/economic-assistance/food-nutrition/programs-and-services/index.jsp).
    - Food assistance programs may include:
        - Supplemental Nutrition Assistance Program (SNAP)
        - Summer Electronic Benefit Transfer (Summer EBT)
        - Supplemental Nutrition Assistance Program - Employment and Training Program (SNAP - E&T)

    - Minnesota Family Investment Program (MFIP).
- The Minnesota Food Helpline helps assess and provide solutions to food needs. This is a program of Hunger Solutions Minnesota, and can be reached at 1-888-711-1151 or at Minnesota Food Helpline (www.hungersolutions.org/programs/mn-food-helpline/).

Rules and Legal Resources

- Legal assistance for renters
  - HOME Line provides free and low-cost legal services for tenants throughout Minnesota in English, Spanish, and Somali at HOME Line (homelinemn.org/).
    - Tenants can call HOME Line toll free at 866-866-3456 or 612-728-5767 or email an attorney on the website.
  - Mid-Minnesota Legal Aid (https://mylegalaid.org/) helps clients with civil cases and questions to ensure each Minnesotan has access to basic rights like housing. They have both regional offices throughout MN and phone intake line at 1-877-696-6529.
- Local rental ordinances
  - Some jurisdictions have protections for renters, such as requirements that painted surfaces be intact. Rental ordinances can be helpful for enforcement, particularly when an environmental risk assessment is not done.
  - Rental ordinances can often be used for primary prevention, as they do not require that children have a certain blood lead level.
- Renovation, Repair, and Paint Rule (RRP)
  - EPA's RRP Rule requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in homes, childcare facilities and pre-schools built before 1978 have their firm certified by EPA (or an EPA authorized state), use certified renovators, and follow lead-safe work practices.
- More information on the RRP Rule can be found at EPA: Lead: Renovation, Repair, and Painting Program (https://www.epa.gov/lead/renovation-repair-and-painting-program).
- Real Estate Disclosure
  - Homebuyers and renters have rights to know about whether lead is present before signing contracts or leases. For example, an EPA-approved information pamphlet on identifying and controlling lead-based paint hazards must be provided.
  - EPA enforces disclosure rules. More information can be found at EPA: Lead: Real Estate Disclosure (https://www.epa.gov/lead/real-estate-disclosure).

Housing Repair and Lead Reduction Resources

Statewide-Resources

- The Swab Team Services Grant provides funding to organizations to provide services including blood lead testing, education and outreach, and interim controls for lead exposure. Swab team services may be limited in availability. More information about the Swab Team Services grant and current grantees are listed on the MDH Swab Team Services Grant (https://www.health.state.mn.us/communities/environment/lead/prof/swabgrant.html) website.

- MDH Healthy Housing Grants (https://www.health.state.mn.us/communities/environment/healthyhomes/hhgrant.html) provide funding to local/tribal public health departments, non-profit organizations, and community action partnerships to perform activities related to housing-based health threats, including primary prevention and assessment and mitigation of hazards in homes. Current grantees are listed on the website.
- Low-interest home improvement loans are available through the Minnesota Housing Finance Agency. Available funding and requirements for low-interest loans vary.
  - Information on available funds can be found through the Minnesota Housing Finance Agency (www.mnhousing.gov) at Improve Your Home (https://www.mnhousing.gov/homeownership/improve-your-home.html). These may include:
    - Fix Up Home Improvement Loan Program
    - Energy Loan Plus
    - Rehabilitation Loan Program and Emergency & Accessibility Loan Program
    - Disaster Recovery Loan Program.
- The Minnesota Homeownership Center: Home Rehab and Repair Program Directory (www.hocmn.org/partner-resources/guides-tools/rehab-repair-program-directory/) is a comprehensive list of localized rehabilitation and repair loan/grant program resources available to current homeowners.
- Weatherization programs offer grants to improve the energy efficiency of the homes of low-income families, which may include home repairs.
  - Local providers can be found through the MN Department of Commerce: Weatherization Assistance Program (https://mn.gov/commerce/consumers/consumer-assistance/weatherization/)
  - MHFA Secured Home Energy Loan | Center for Energy and Environment (https://www.mncee.org/mhfa-secured-home-energy-loan) Through the Minnesota Housing and Finance Agency (MHFA) and the Minnesota Department of Commerce, CEE offers home energy loans for Minnesota homeowners to make energy improvements in their homes.
- If a person has a Health Savings Account (HSA) or Health Care Flexible Savings Account (FSA), those pre-tax dollars can be used to remove lead. This would require getting a letter of medical necessity from a primary health care provider (which would probably require a blood lead test with an elevated result $\geq$ 3.5 mcg/dL on a venous sample).

Area-Specific Resources

- MDH Lead Hazard Reduction Grants (https://www.health.state.mn.us/communities/environment/lead/prof/leadhazgrants.html) provides grant funding for residents in an 11-county area in southeastern Minnesota to fix hazards like lead paint and other safety issues in owner-occupied and rental homes.
- Local Community Action Partnerships (CAP) may sometimes have funds available for home repairs. You can find your local Community Action Partnership agency at Minnesota Community Action Partnership (https://minncap.org/).

- Counties or cities sometimes have home repair loan or grant programs. If these programs exist, they would be listed on your city or county website. Three known cities/counties with current programs are:
  - Funding assistance for home health and safety hazards (https://www.hennepin.us/en/residents/property/lead-paint-hazards): Hennepin County offers a variety of programs, including support to detect and remove lead paint as well as a household item testing program, to help families prevent and reduce the risk of lead poisoning.
  - Minneapolis Renovation Grants (www.minneapolismn.gov/resident-services/property-housing/healthy-homes/renovation-grants/) manages multiple grants to support property owners in renovating homes to remove lead and other home hazards.
  - St. Paul Ramsey County Lead Removal Grant (www.ramseycounty.us/residents/health-medical/healthy-homes/lead-home) provides grant funding to reduce lead poisoning in children by replacing windows with lead-based paint and addressing other hazards.
- The Small Cities Development Program is administered through the Minnesota Department of Employment and Economic Development, and includes funds for housing grants in selected cities.
  - More information on current projects can be found at the MN Department of Employment and Economic Development: Small Cities Development Program: (mn.gov/deed/government/financial-assistance/community-funding/small-cities.jsp).
- USDA Single Family Housing Home Repair Loan and Grant Program (www.rd.usda.gov/sites/default/files/508_rd_fs_rhs_sfh504homerepair.pdf) provides loans to very-low-income homeowners to repair, improve, or modernize their homes, or provides grants to elderly, very-low-income homeowners to remove health and safety hazards. Properties must be located in an eligible rural area.
- Lead remediation or home improvement grants
  - Available funding varies.
  - The HUD Office of Lead Hazard Control and Healthy Homes provides grants to local jurisdictions. For information on current grantees, visit HUD Office of Lead Hazard Control and Healthy Homes (http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes).
- Various non-profit organizations may provide or facilitate grants or loans to address lead hazards. Some examples include:
  - Rebuilding Together Minnesota (https://rtmn.org/) Rebuilding Together Minnesota is a non-profit organization operating in various locations throughout Minnesota that offers home repair and other services.
  - NeighborWorks Home Partners - Home Improvement Loans (https://nwhomepartners.org/fix-your-home-loan/) is a non-profit organization that offers or facilities home improvement loans in the Twin Cities area.

Sources of Lead

Case managers should be aware of common sources of lead when interacting with families or doing educational visits when a risk assessor is not present. The following list is provided to give background information on common sources of lead. MDH can provide additional information or technical assistance when unusual or newly emerging lead sources are suspected.

Public health professionals should be aware of common sources of lead when interacting with families. For children, the primary route of exposure is ingestion of products or dust containing lead. The following list is provided to give background information on common sources of lead, and is also available in a webpage or factsheet at MDH Common Sources of Lead (www.health.state.mn.us/communities/environment/lead/fs/common.html). This factsheet also provides information on how to reduce exposure to different lead sources. This and other educational materials on specific lead sources can be found at Lead Fact Sheets and Brochures (www.health.state.mn.us/communities/environment/lead/fs/index.html) MDH can provide additional information or technical assistance when unusual or newly emerging lead sources are suspected.

Paint and Dust

- Lead dust is currently the main source of lead exposure among children. Even tiny amounts of dust from lead paint can cause a child's blood levels to rise. Household dust can contain lead from:
  - Lead-painted friction surfaces such as windows, doors, or floors
  - Cracked, chipped, or peeling lead-based paint
  - Home remodeling, renovation, or paint projects
  - Contaminated soil tracked into the home.
- Homes built before 1978 may contain lead-based paint. Children can be exposed to lead in paint through:
  - Lead-painted friction surfaces such as windows, doors, or floors
  - Cracked, chipped, or peeling lead-based paint
  - Home remodeling, renovation, or paint projects.
- One third of homes in Minnesota may have lead paint. Older homes are more likely to have sources of lead.
  - 75–85% of Minnesota children with a high blood lead level have hazardous lead paint in their home.
  - Lead paint exposures can occur at home, daycare, or a relative's home.
  - Window components, porches, and home exteriors are common areas to find lead-based paint.
    - Other areas include walls, floors, doors, door frames, bannisters, baseboards, and antique bathtubs.
- Cleaning Up Lead Dust in Your Home (https://www.health.state.mn.us/communities/environment/lead/docs/fs/cleaningup.pdf) provides information about cleaning up dust and paint chips.

Renovation of Older Homes

- Renovation creates large amounts of dust, which can lead to both lead inhalation and ingestion exposures and high blood lead levels in homes built before 1978.
  - Certain renovation practices, such dry-sanding paint or using heat guns to remove paint are particularly dangerous.
    - Lead-safe work practices should be used when renovating a home built before 1978. Information on lead-safe work practices and information on hiring a contractor and certifications for different types of renovation or lead removal work are available at MDH Lead Poisoning Prevention: Homeowner Information (www.health.state.mn.us/communities/environment/lead/home/index.html).
    - Federal law requires that all contractors performing renovation work in pre-1978 residences to be certified. More information is available at EPA Lead Renovation, Repair, and Painting Program (www.epa.gov/lead/lead-renovation-repair-and-painting-program) and Minnesota Lead Renovation, Repair, and Paint (RRP) Rulemaking (www.health.state.mn.us/communities/environment/lead/rules/rrp/index.html).

Soil and Water

Soil

- Bare soil can be a source of lead, especially in areas near busy streets, old homes, buildings, or fences from past uses of leaded gasoline or lead-based paint.
  - 30–40% of Minnesota children with a high blood lead level have hazardous levels of lead in soil at their home.
  - Bare soil should be covered with a durable ground cover such as grass or mulch and shoes should be removed at the door to reduce the chance of lead exposure.

Water

- Lead in water is not commonly a cause of elevated blood lead levels in Minnesota but may contribute to low levels of lead.
- Municipal water supplies and private wells in Minnesota are not generally a substantial source of lead. Lead can enter drinking water as it passes through household plumbing or lead service lines.
  - Homes built before 1986 may have lead parts in their plumbing systems. Plumbing in buildings built after 1986 may still have some parts containing low levels of lead.
- Water can be tested if there is a concern about lead contamination. Local jurisdictions (cities or counties) may have free or discounted water testing available; this varies from jurisdiction to jurisdiction. Well Testing, Results, and Options (www.health.state.mn.us/communities/environment/water/wells/waterquality/tips.html) has more information about testing well water.
- Only water from the cold tap should be used for cooking or drinking. Let the water run before using it for drinking or cooking.
  - If you have a lead service line, let the water run for 3-5 minutes. If you do not have a

lead service line, let the water run for 30-60 seconds.

- More information is available at Lead in Drinking Water (www.health.state.mn.us/communities/environment/water/contaminants/lead.html).

Lead-Related Occupations and Industries

Lead is used in a variety of industries. Children may be exposed to lead dust if it is carried home from the workplace on the clothing, shoes, or body of a household member who works with lead. Precautions should be taken to reduce children's exposure to take-home lead, including:

- Washing hands frequently
- Not smoking or eating in areas where lead may be present
- Taking shoes off before entering the home
- Changing out of work clothes and shoes and showering before getting in one's vehicle or going home
- Washing work clothes separately from other clothing or having work clothes laundered at work.

Hobbies can also be a source of lead exposure. Often, hobbies are performed in or around the home, leading to increased opportunities for family members to be exposed. Hobbies that involve lead should be performed in well-ventilated areas and away from areas to which children have access.

Common occupations, industries, and hobbies where lead exposure may occur include:

- Art including ceramics/pottery, jewelry, painting, stained glass, prints, and lead figurines
- Automobile and ship manufacturing, body work, and repair
- Manufacturing of glass, paint, pigment, plastic, ammunition, fishing sinkers, batteries, ceramics, cable, wire, countertops, industrial machinery, rubber products, and electrical components
- Construction, demolition, and bridge reconstruction
- Renovation, refinishing, remodeling, lead abatement, painting, paint removal
- Plumbing, pipe fitting, radiator repairs
- Restoring or refinishing antique products and furniture, or upcycling and reuse of old barn wood or painted wood
- Using or working at firing ranges, making ammunitions or explosives, reloading shotgun shells, working as a gunsmith or police officer, and being a member of the armed forces
- Metal processing and industrial work including mining or refining lead, cable and wire splicing or production, welding, burning, or cutting metals, or foundry work
- Recycling or salvaging metal, glass, electronics, and batteries, working as a solid waste incinerator operators or junkyard employee
- Bleigiessen or Molybdomancy (tradition of dropping molten lead into water to make future predictions)
- This should not be considered an exhaustive list of all potential occupational lead sources.

Food and Cookware

Imported or Recalled Spices and Candies

- Imported or recalled spices may contain lead.
  - Spices most at risk are those that are unlabeled and have been purchased outside of the U.S. If spices are suspected, families should switch to spices purchased in the U.S.
  - Examples of spices that have been found to contain lead include:
    - Turmeric, which is the most common spice found to be adulterated with lead in Minnesota communities
    - Other spices such as cinnamon, chilies, curry powder, or various spice mixes.
  - Food products that contain spices may be at risk if the spices contain lead.
    - If there is a recall of a spice or food for lead, families should stop using the product and follow product recall instructions.
    - Imported candy from multiple countries has also been found to contain lead.

Other Food Products

- Game meat harvested with lead ammunition
  - Lead bullets can fragment extensively, and trimming away meat around the wound channel is not sufficient to prevent lead exposure.
  - Alternatives include use of non-lead ammunition, bow hunting, or consumption of other protein sources.
- Food grown in lead-contaminated soils
  - When gardening in potentially contaminated sites, test soil for contaminants or build raised beds and use clean soil as discussed in MDH Gardening in Urban Soil (https://www.health.state.mn.us/communities/environment/hazardous/topics/gardurbsoil.html).

Imported or Handmade Pottery or Ceramics, Other Cookware

- Imported or handmade pottery, ceramics, or other cookware with a lead glaze may contain lead that could leech into food or drink.
  - Lead is most likely to leach into food or drink when ceramics or cookware are used for storing liquids or acidic materials, for heating foods in the oven, stovetop, or microwave, or when lead-glazed pottery is fired under lower temperatures.
- The Food and Drug Administration (FDA) has regulations for labeling lead-glazed pottery as not for use with food. However, some imported or handmade products may not comply, and the use of heirloom cookware is common.
  - Many shops in Minnesota do small-scale imports of pottery, especially from Latin American countries, which have not undergone FDA lead testing or inspection.
- If pottery, ceramics, or cookware are suspected, it is recommended that the family replace the product with a lead-free version or use the product for decoration purposes only.
- Examples of pottery, ceramics, or other cookware found to contain lead include:
  - Bean pots
  - Tajines

- Clay or ceramic pots, pitchers, mugs, jars, and dishes, especially ones that are painted or antiques
- Handmade or imported pottery with lead glaze
- Imported or antique pressure cookers or crockpots
- Pewter dishes and leaded crystal.

Cosmetics and Traditional or Alternative Remedies

Cosmetics and Religious Powders or Products

- Imported cosmetics and religious powders or products may contain lead.
- Traditional cosmetics or religious powders may be culturally important to individuals, so it is important to work with families to help them understand possible risks and benefits.
- The following are some examples of traditional medications/alternative remedies grouped by the community known to use the product:
  - South Asian and Indian Communities:
    - Sindoor, vermillion, or kumkum is a red or orange powder used for bindi dots, along the hairline to signify marriage status, for religious purposes, or on prayer stations.
  - Asian, African, and Middle Eastern Communities:
    - Kohl, alkohl, kajal, tiro, or surma is a black powder or liquid used as eyeliner for cosmetic purposes, to promote eye health, to ward off evil, or to treat skin infections or promote healing around umbilical stumps.
      - Kohl is banned for sale in the United States.

Traditional Medications, Alternative Remedies and Products

- Products from many forms of traditional, herbal, or alternative medicines and remedies have been found to contain lead.
  - Products may be imported or purchased in the United States in stores or online, and country of origin cannot be used as an indicator of product safety.
  - Traditional remedies may be culturally important to individuals, so it is important to work with families to help them understand possible risks and benefits.
  - The use of traditional or alternative remedies is not confined to immigrant communities.
- The following are some examples of traditional medications/alternative remedies that have been found to contain lead:
  - Ayurvedic medicines
    - Ayurvedic medicines are Hindu traditional medicines and have many names and a variety of forms and uses and are often used by people from many different backgrounds.
    - Rasa Shastra is a subset of Ayurvedic medicines and is more likely to contain lead because they may have heavy metals or minerals added intentionally for purported therapeutic effects.
  - Chinese traditional medicines and traditional medicines from other communities
    - These are generally powders used to treat a variety of illnesses, including digestion issues, fevers, skin infections, fevers, colic, and respiratory issues.
  - Various forms of clay, chalk, or earth is sometimes taken internally for various uses such

as treating morning sickness or promoting digestion.
    - Calabash chalk or clay, bentonite clay, and diatomaceous earth are some of the most common forms.
- Herbal supplements including dietary supplements
- Imported gripe water
- Other sources: this is not an all-inclusive list

Other Sources of Lead

Exposures that Occurred in Another Country

- Individuals who have recently moved from or spent substantial time in another country may have greater risk for lead exposure, depending on the environmental regulations and sources of exposure in that country.
    - Lead paint and leaded gasoline are still allowed in some countries.
    - Some countries have stricter regulations about lead in foods and products than others.

Pica Behavior

- Pica is the deliberate ingestion of nonfood items and can cause elevated levels of lead in people. Pica in children can include chewing, gnawing on, or eating materials including:
    - Paint chips
    - Soil or clay
    - Windowsills, bannisters, floorboards, doorframes, painted surfaces in homes or on furniture or toys, plaster, or sheetrock.
- If pica behavior is identified, it should be managed to prevent exposure to substances containing lead.

Jewelry, Amulets, Toys, Keys, Fishing Sinkers, Chalk, and Furniture

- Children may put objects that may contain lead in their mouths. These may include:
    - Jewelry, amulets, beads, hair clips, clothing charms or good luck charms
        - Amulets may have different names, such as tabeez or tabiz, and may be worn for religious purposes or to ward off evil and may not be considered jewelry by families.
    - Keys, including car and door keys
    - Fishing sinkers, bullets, or pellets
    - Chalk, especially colored sidewalk chalk
    - Imported, antique, painted, or recalled children's toys, blocks, musical instruments, and metal toys such as cars
    - Antique furniture, and decorative pieces made from recycled/upcycled wood, doors, shutters, or other products containing lead paint from old buildings or barns.

Retained Bullets

- An individual may have an elevated BLL if they have any retained bullets in their body from past gunshot wounds.

Resources for Identifying Products Containing Lead, Including Recalls

- Some resources for identifying potential items containing lead are listed below.
- To check for recalled products that were sold in the United States and contain lead:
  - Recalled foods, supplements, cosmetics, and some other products are listed on the U.S. Food & Drug Administration (FDA) Recalls, Market Withdrawals, & Safety Alerts (https://www.fda.gov/safety/recalls-market-withdrawals-safety-alerts) website.
  - Recalled items such as toys are listed on the United States Consumer Product Safety Commission (www.cpsc.gov/Recalls) website.
- To gain a general idea of potential products containing lead:
  - New York City maintains a database open to the public of the Metal Content of Consumer Products Tested by the NYC Health Department (https://data.cityofnewyork.us/Health/Metal-Content-of-Consumer-Products-Tested-by-the-N/da9u-wz3r/data).
    - This database includes over 2,000 products tested for lead in New York City, including food, spices, cosmetics, medications, children's products, pottery, jewelry, and other sources. While individual products may or may not be found in Minnesota, the database provides ideas of potential sources.

Minnesota Department of Health Resources

Contact Information

The Minnesota Department of Health contact information for the most common questions and concerns from health care providers are listed below. Other contact information is available at the MDH Lead Poisoning Prevention Contacts (www.health.state.mn.us/communities/environment/lead/contactus.html).

Questions Regarding:	Contact Information:
▪ Elevated blood lead case management ▪ Guidance on blood lead testing	Phone Number: 651-201-4892
▪ Reporting blood lead results to MDH ▪ Incoming or outgoing blood lead results	Phone Number: 651-201-4919 Email: health.bloodleadresults@state.mn.us Fax Number: 800-388-9389 Mailing Address: Minnesota Department of Health, Health Risk Intervention Unit, P.O. Box 64975, St. Paul, MN 55164-0975

Educational Materials

Lead Fact Sheets and Brochures (https://Lead Fact Sheets and Brochures (www.health.state.mn.us/communities/environment/lead/fs/index.html)ad exposure and prevention in 19 different languages. Printed materials may be ordered through an order form on this page or viewed online.

Guidelines

In addition to this document, the Minnesota Department of Health has developed and periodically updated Blood Lead Level Guidelines (https://Blood Lead Level Guidelines (www.health.state.mn.us/communities/environment/lead/prof/guidelines.html) webpage and include:

- Childhood Blood Lead Screening Guidelines for Minnesota
- Blood Lead Screening Guidelines for Pregnant and Breastfeeding Women in Minnesota
- Childhood Blood Lead Case Management Guidelines for Minnesota.

Accessing Data

The Minnesota Public Health Data Access: Childhood Lead Exposure (https://data.web.health.state.mn.us/web/mndata/lead) contains maps, charts and data for childhood lead exposure, lead testing, and risk factors. Data are available at the state level and by county and census tract.

Minnesota Department of Health Lead Webpage

Additional information on topics not covered in these guidelines may be found at Minnesota Department of Health: Lead (www.health.state.mn.us/communities/environment/lead/index.html).

Commonly Used Terms

Blood lead level (BLL): A diagnostic blood lead test with units of micrograms of lead per deciliter of whole blood in any person.

Child: An individual under 18 years of age.

Clearance inspection: Identification of deteriorated paint and bare soil and resampling and analysis of interior dust lead concentrations in a residence to ensure that an environmental case can be closed.

Capillary blood sample: A quantity of blood drawn from a capillary. The sample generally is collected by finger stick. Elevated results must be confirmed with a venous blood sample.

Case manager: A local public health professional who works with the families of children with elevated blood lead levels to assess needs and facilitate access to needed resources.

Environmental risk assessment, or lead risk assessment: An investigation to determine the existence, nature, severity, and location of lead hazards.

Elevated blood lead level (EBLL): A diagnostic blood lead test with a result that is equal to or greater than 3.5 micrograms of lead per deciliter of whole blood in any person.

Health care provider: A physician, nurse practitioner, physician assistant, nurse, or other health professional in a medical setting.

Interim controls: A set of measures intended to temporarily reduce human exposure or likely exposure to known or presumed lead hazards, including specialized cleaning, repairs, maintenance, painting, temporary encapsulation, or enclosure.

Lead hazard: A condition that causes exposure to lead from dust, bare soil, drinking water, or deteriorated paint that exceeds MDH standards.

Lead hazard reduction: Abatement or interim controls undertaken to make a residence or other facility lead-safe.

Lead order or lead correction order: A legal instrument to compel a property owner to address lead hazards according to the specifications given by the assessing agency.

Lead risk assessor: An individual who performs lead risk assessments or lead inspections and who has been licensed by the Minnesota Department of Health.

Lead risk assessing agency: An agency that performs lead risk assessments or lead inspections with lead risk assessors who has been licensed by the Minnesota Department of Health.

Lead-safe practices: Methods for construction, renovation, remodeling, or maintenance activities that are not regulated lead work and that are performed so that they do not result in exposure to lead.

Local public health (LPH) department: The public health department or agency of a city, county, or Community Health Board that is working with an individual with an elevated blood lead level.

mcg/dL: Micrograms of lead per deciliter of whole blood. Also expressed as µg/dL.

Minnesota Department of Health (MDH): The state health department that receives all blood lead tests results for Minnesota residents and provides case coordination, technical assistance, and environmental risk assessments.

Minnesota Regional Poison Center: The system that provides free recommendations for poison exposure management and public and professional education services for the people living in Minnesota, North Dakota, and South Dakota.

Pediatric Environmental Health Specialty Unit (PEHSU): Academically based units that are typically at university medical centers that serve as a source of medical information and advice on environmental conditions that influence reproductive and children's health.

Refugee: A foreign-born resident who is not a United States citizen and who cannot return to his or her country of origin or last residence because of persecution or the well-founded fear of persecution because of race, religion, nationality, membership in a particular social group, or political opinion, as determined by the State Department or United States Citizenship and Immigration Services (USCIS).

Region 5 Pediatric Environmental Health Specialty Unit (PEHSU): The Pediatric Environmental Health Specialty Unit (PEHSU) that serves the geographic region that includes Minnesota.

Performing Facility: The hospital, medical clinic, medical laboratory, other facility, or individual performing blood lead analysis.

Primary prevention: Preventing lead exposure before blood levels become elevated.

Secondary prevention: Intervention to mitigate health effects on people with elevated blood lead levels.

Swab team services: Activities that provide protection from lead hazards primarily through the use of interim controls, such as:

- Removing lead dust by washing, vacuuming with high efficiency particle accumulator (HEPA) or wet vacuum cleaners, and cleaning the interior of residential property, and
- Removing loose paint and paint chips and repainting or installing guards to protect intact paint.

Tribal public health (TPH) department: The public health department or agency of a Tribal Nation that is working with an individual with an elevated blood lead level.

Venous blood sample: A quantity of blood drawn from a vein. This is considered a confirmatory test and is required for a child to be eligible for some services.

µg/dL: Micrograms of lead per deciliter of whole blood. Also expressed as mcg/dL.