Minnesota Childhood Blood Lead Screening Guidelines: Reference Manual

2022 REVISION

Minnesota Childhood Blood Lead Screening Guidelines

Guidelines Developed 2000
Revisions: 2011, 2022

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

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Contents

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Childhood Blood Lead Screening Guidelines for Minnesota Revision Workgroup:

- Erin Batdorff, MD, Minnesota Poison Control System
- Jennifer Beckenbach, East Side Neighborhood Development Company (ESNDC)
- Helen Binns, MD, MPH, Region 5 Pediatric Environmental Health Specialty Unit (PEHSU): Great Lakes Center for Children's Environmental Health
- David Bothun, Countryside Public Health
- Laura Clouser, East Side Neighborhood Development Company (ESNDC)
- Anne DeJoy, East Side Neighborhood Development Company (ESNDC)
- Mateo Frumholtz, MPH, Minnesota Department of Health (MDH)
- Ryan Fuchs, MD, Minnesota Poison Control System
- Kathryn Haugen, MPH, Minnesota Department of Health (MDH)
- Jeff Huotari, MD, Blue Cross and Blue Shield of Minnesota
- Heidi Innvaer, PHN, Carver County Health and Human Services
- Dana Janowiak, DNP, RN, PHN, St. Paul-Ramsey Public Health Department
- Stacy Laurent, MD, Region 5 Pediatric Environmental Health Specialty Unit (PEHSU): Great Lakes Center for Children's Environmental Health
- Faith Kidder, APRN, MS, PHN, Minnesota Department of Health (MDH)
- Rebecca Lange, PharmD, CSPI, Minnesota Poison Control System
- Nick Lehnertz, MD, Minnesota Department of Health (MDH)
- Jason Maxwell, MD, HealthPartners
- Michael Melius, Olmstead County Public Health Services
- Abby Montague, MD, Minnesota Poison Control System
- Shannon Neale, MD, HealthPartners
- Melissa Nelson, MPH, RDN, LD, Minnesota Department of Health (MDH)
- Travis Olives, MD, Minnesota Poison Control System
- Elizabeth Parten, RN, PHN, Hennepin Healthcare: MVNA
- Rachelle Peleska, MPH, Sustainable Resources Center, Inc. (SRC)
- Liz Placzek, MD, Minnesota Chapter of the American Academy of Pediatrics (MN AAP)
- Colleen Quesnell, CNM, Minnesota Nurse Practitioners (MNNP)
- Alejandro Peralta Reyes, MPH, East Side Neighborhood Development Company (ESNDC)
- Zaynab Rezania, MPH, Minnesota Department of Health (MDH)
- Lily Rubenstein, RN, Minnesota Department of Health (MDH)
- Alison Salita, RN, HealthPartners
- Lisa Smestad, City of Minneapolis Health Department
- Maria Starchook-Moore, MD, Minnesota Medical Association (MMA)
- Nellie Swanson, APRN, CNP, Minnesota Chapter of National Association of Pediatric Nurse Practitioners (MN NAPNAP)
- Kailey Urban, MPH, Minnesota Department of Health (MDH)
- Cora Vavra, MPH, Minnesota Department of Health (MDH)
- Sarah Walker, PHN, Dakota County Public Health
- Amy Waller, PHN, Hennepin Healthcare: MVNA
- Stephanie Yendell, DVM, MPH, Minnesota Department of Health (MDH)
- Erik Zabel, PhD, MPH, Minnesota Department of Health (MDH)

These guidelines have been reviewed and approved by:

- East Side Neighborhood Development Company (ESNDC)
- HealthPartners
- Local Public Health Association of Minnesota (LPHA)
- Minnesota Chapter of National Association of Pediatric Nurse Practitioners (MN NAPNAP)
- Minnesota Environmental Health Association (MEHA)
- Minnesota Medical Association (MMA)
- Minnesota Nurse Practitioners (MNNP)
- Minnesota Poison Control System
- Region 5 Pediatric Environmental Health Specialty Unit (PEHSU): Great Lakes Center for Children's Environmental Health
- 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' or guardians' workplaces and hobby areas, lead in plumbing, and some imported products and traditional remedies. However, deteriorated lead paint in homes is the main source 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, guardians, and professionals across many disciplines. However, lead persists as an environmental contaminant. In Minnesota, 545 children under 6 years of age had confirmed elevated blood lead levels (EBLLs) in 2021; 166 more children had elevated capillary results without follow-up venous results.

These guidelines represent a set of best practices and recommendations for health care providers, local public health, and other individuals or organizations who are determining which children to test for lead. They are based on national recommendations and input from a multi-disciplinary workgroup. These guidelines may be adapted for use within a specific clinic system, depending on resources available.

The 2022 revision of these guidelines includes several important updates. CDC now recognizes that there is no safe level of exposure to lead, and 3.5 µg/dL was set as a reference value in 2021. Minnesota Statutes define EBLLs as 5 µg/dL and above. These guidelines align with Minnesota Statute updates in 2021 and the current definition of an EBLL. The guidelines were also edited to improve clarity and provide health care providers with specific resources to which they can refer families.

Past versions of these guidelines have recommended targeted blood lead screening. Targeted blood lead screening indicates which children should be tested for lead based on identified risk factors. This current version of the Childhood Blood Lead Screening Guidelines recommends universal blood lead screening of all children in Minnesota at 12 and 24 months of age, and targeted blood lead screening for children ages three through seventeen years. This recommendation to test all children at 12 and 24 months of age is a major shift from past guidelines and is based on available research and recommendations from a multi-disciplinary workgroup.

Purpose of Screening Guidelines

The Childhood Blood Lead Screening Guidelines are for the identification of children who should have a blood lead test. These guidelines represent a set of best practices and recommendations for health care providers, local public health, and others working with children who may be exposed to lead. Other guidelines regarding blood lead treatment and

case management 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

Types of Blood Lead Tests

Levels of lead in the body are determined through a blood lead test. Blood lead test results are 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. EBLLs on capillary samples should be confirmed with a venous sample according to the timelines on page 16 in Follow-up Blood Lead Testing; the sooner elevated capillary results can be confirmed, the better.

Blood lead tests on venous samples are drawn with a needle from a vein, 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 some cases, it might make sense to do a blood lead test on a venous sample right away instead of a capillary: 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). For more information about when a blood lead test on a capillary versus a venous sample is recommended, see below table.

[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

Circumstances for determining whether a Blood Lead Test on a Capillary or Venous Sample is More Appropriate

A capillary sample is more appropriate when:	A venous sample is more appropriate when:
▪ A routine screening test is being done, especially when lead exposure is less likely ▪ A blood lead test is being performed in settings that that do not have the capacity for venous draw ▪ Parents and guardians and/or patients prefer to minimize the need for venous draws ▪ It can be analyzed during the appointment rather than having to wait for results to come back from a lab	▪ A blood lead test is being done to confirm an elevated blood lead test result on a capillary sample ▪ Recurring follow-up blood lead tests are being done once an individual has a confirmed elevated blood lead level (EBLL) ≥ 5.0 µg/dL ▪ A blood draw is already being done for another reason ▪ It might be difficult to get a patient back into a clinic for a confirmatory test if the screening test comes back elevated ▪ A patient is suspected of already having an EBLL (for example: when a household member has an EBLL)

Procedures for Taking Blood Lead Tests

It is important to use correct procedures when taking capillary or venous samples for blood lead tests to ensure accuracy and reduce possible lead contamination. Proper procedures reduce lead contamination through steps including wearing gloves and washing a patient's hands with soap and water. The U.S. Centers for Disease Control and Prevention (CDC) has produced several resources about appropriate protocol for taking blood lead samples:

- Webpage: Blood Lead Levels in Children (https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm)
- YouTube Video: Mission Unleaded: How to test children for lead with maximum accuracy (https://www.youtube.com/watch?v=e1VL1p9Yaas)
- Poster: Steps for Collecting Fingerstick Blood Samples in Micro-Vials for Lead Testing (https://www.cdc.gov/biomonitoring/pdf/Lead_Fingerstick_Poster-508.pdf).
  - The contents of this poster have been copied below for your convenience.

"Steps for Collecting Fingerstick Blood Samples in Micro-Vials for Lead Testing"

1. "Place all collection materials on top of disposable pad. Open the lancet, alcohol swabs, gauze, bandage, and other items. Have all items ready for blood collection.
2. Wash the patient's hands thoroughly with soap and water. Allow them to air dry without touching any surface. Do not use paper towels to dry the patient's hands. Put on your powder free gloves.

3. Massage the patient's hand and lower part of the finger to increase blood flow. Turn the hand down.
4. Scrub the patient's middle finger or ring finger with an alcohol swab.
5. Hold the finger in a downward position and lance the palm side surface of the finger.
6. Apply slight pressure to start blood flow. Blot the first drop of blood on a gauze pad without touching the finger and discard the gauze in appropriate container.
7. Keep the finger in a downward position to maintain blood flow. Hold the micro-collection tube at an angle of 10 degrees below the collection site and touch the tapered end of the tube into the droplet of blood. Do not touch the skin with the tube. Fill the micro-collection vial with the appropriate amount of blood as defined by the micro-collection container that you are using.
8. Once you have collected enough blood, apply a slight pressure to the finger to stop the bleeding. Apply a sterile adhesive bandage over the puncture site.
9. Seal the specimen container and, inverting it immediately, gently invert container 7-10 times to prevent clots from forming.
10. Place the label on the vial. If the label contains a barcode, the barcode needs to be vertical like a ladder when placed on the vial. If the barcode is not vertical, the laboratory will not be able to read the label. Properly discard all used materials. Contact the laboratory for storage and transport guidance."

In addition to the steps above, ensuring a child's hands are warm will improve blood flow. Much of the information in steps 1 and 2 above also apply to taking venous samples. Have all items ready for blood collection and put on powder free gloves. Draw and fill the lead tube first if drawing for multiple tubes with venous samples.

Reporting Blood Lead Test Results

According to Minnesota Statutes 144.9502, Subdivisions 3–4 (Minnesota Statutes 144.9502, Subdivisions 3–4 (https://www.revisor.mn.gov/statutes/cite/144.9502)), all blood lead test results must be reported to MDH by the hospital, medical clinic, medical laboratory, other facility, or individual performing blood lead analysis. For these guidelines, a facility performing blood lead analysis will be referred to as a performing facility. Subdivision 7 also states that facilities can report the information required under this section without liability. Elevated blood lead results must be reported to MDH within two business days, and non-elevated blood lead results must be reported to MDH no later than one month.

Health care providers do not need to call MDH to report EBLLs or individual blood lead test results. Health care providers should ensure their lab is aware of the requirement to report all blood lead tests to MDH. If a clinic uses a point-of-care blood lead test, health care providers should confirm the clinic has protocols in place to ensure all blood lead test results are reported to MDH. If a health care provider is concerned that blood lead result(s) have not been appropriately reported to MDH by the performing facility, they may call 651-201-4919.

All blood lead test results must include:

- Whether the specimen was collected as a capillary or venous sample
- The date the sample was collected
- The results of the blood lead analysis

- The date the sample was analyzed
- The method of analysis used
- The full name, address, and phone number of the laboratory performing the analysis
- The full name, address, and phone number of the physician or facility requesting the analysis
- The full name, address, phone number, birthdate, gender, race, and ethnicity of the person who received the blood lead test, and their guardian's name if available

Data must be submitted by telephone, fax, or electronic transmission "as prescribed by the commissioner." The facility performing the blood lead test is responsible for reporting the blood lead test result to MDH. Information about reporting blood lead tests to MDH, including reporting through electronic submission, can be found at Blood Lead Information System (https://www.health.state.mn.us/communities/environment/lead/prof/surv.html).

Blood Lead Reference Value

In 2021, the U.S. Centers for Disease Control and Prevention (CDC) announced that they updated their blood lead reference value (BLRV) from 5.0 µg/dL to 3.5 µg/dL, in response to a 2021 recommendation from the Lead Exposure Prevention and Advisory Committee (LEPAC). The BLRV is based on the 97.5th percentile of the blood lead level (BLL) distribution in U.S. children ages 1–5 years. It is not based on evidence of a direct benefit or harm to individual children. For more information, please see the press release CDC Updates Blood Lead Reference Value for Children (https://www.cdc.gov/media/releases/2021/p1028-blood-lead.html).

CDC's recommendation does *not* automatically change the definition of an EBLL or Minnesota guidelines. An EBLL in Minnesota is greater than or equal to 5 µg/dL, and children with BLLs less than 5 µg/dL do not receive follow-up from public health. Changing the definition of an EBLL in Minnesota would require legislative action or a declaration by the MDH Commissioner that doing so is in the interest of public health. MDH will continue to monitor any new data regarding the benefit of individual interventions between 3.5 and 5 µg/dL. For the time being, MDH is focusing on interventions for children with BLLs $\geq$ 5 µg/dL and primary prevention efforts. MDH does receive all blood lead test results, so MDH will be able to monitor the number of children with BLLs between 3.5 and 5 µg/dL.

Health care providers may choose to confirm capillary BLLs between 3.5 and 5 µg/dL with a venous test if they feel that is a benefit to their patient, but we do not have a universal recommendation to do so at this time. BLLs < 5 µg/dL are not considered elevated, so children with BLLs < 5 µg/dL will not receive case management or follow-up at this time.

Targeted versus Universal Screening

Past versions of these guidelines have recommended targeted blood lead screening. Targeted blood lead screening indicates which children should be tested for lead based on identified risk factors. This current version of the Childhood Blood Lead Screening Guidelines recommends universal blood lead screening of all children in Minnesota at 12 and 24 months of age, and targeted blood lead screening for children 3–17 years of age. This recommendation to test all

children at 12 and 24 months of age is a major shift from past guidelines and is based on available research and recommendations from a multi-disciplinary workgroup.

Lead poisoning prevention policies, such as the Lead-Based Paint Poisoning Prevention Act and the Lead Contamination Control Act, have resulted in decreases in lead hazards and EBLLs in children overtime. However, many lead hazards in housing and in the environment remain. In Minnesota, about 21% of housing was built prior to 1950, while about 55% was built prior to 1980. Forty-eight of the 87 Minnesota counties (55%) have over 25% of their housing stock built before 1950, and all 87 Minnesota counties (100%) have over 25% of their housing built before 1980.[2]

Products produced or contaminated with lead are also unfortunately common in our environment. Non-housing sources of lead may include workplaces, hobbies, antiques, toys, keys, traditional medicines and cosmetics, amulets, jewelry, cookware, pottery, and food. Public health professionals also continue to identify new and emerging sources of lead including products purchased online, locally, and abroad. With so many possible sources of lead exposure, there is concern that targeted screening cannot account for all sources of lead, and thus some children with EBLLs may be missed. Universal blood lead screening will ensure that all children in Minnesota receive blood lead tests at 12 and 24 months, no matter their possible sources of lead exposure.

The American Academy of Pediatrics' (AAP) policy statement on the "Prevention of Childhood Lead Toxicity"[3] cited studies that have found that risk screening questionnaires often fail to identity children exposed to lead. This policy statement emphases the importance of preventing and reducing sources of childhood lead exposure, rather than just focusing on identifying children who have already been exposed. Preventing and reducing sources of lead exposure are important as there is no safe level of lead and there is no treatment available for low BLL concentrations. Universal screening of children at 12 and 24 months may help identify sources of lead to be targeted for primary prevention.

In their policy statement, the AAP recommended blood lead testing for asymptomatic children according to federal and state requirements, and blood lead testing for *all* children 12 to 24 months of age living in communities with ≥ 25% of housing built before 1960. As a majority of counties in Minnesota have over 25% of their housing built before 1960, this AAP policy statement would indicate universal blood lead testing for children aged 12 and 24 months in Minnesota is appropriate.

Importance of Blood Lead Testing at Both 12 and 24 Months

Children should receive a blood lead test at *both* 12 and 24 months of age, but oftentimes that does not happen. Often, health care providers or parents and guardians believe that if a child did not have an EBLL at 12 months, they do not need to receive a blood lead test at 24 months of age. Two-year-old children are more mobile and interact with their environments differently

[2] Minnesota Department of Health. Risk factors for childhood lead exposure. Minnesota Department of Health. Updated May, 2022. Accessed August 25, 2022. https://data.web.health.state.mn.us/lead_risk

[3] AAP Council on Environmental Health. Prevention of childhood lead toxicity. *Pediatrics.* 2016;138(1). doi: 10.1542/peds.2016-1493

than one-year-old children. This can change the risk for lead exposure between these ages, even if the child's house or other risk factors do not change. This is supported by MDH surveillance data: of children with an EBLL at two years of age, 40% were tested and had a non-elevated test at one year of age. If children at 24 months of age do not receive a blood lead test, lead-exposed children may go undetected.

Among children born in 2018 residing in Minnesota, 70% were tested around one year of age (9 to 18 months), but only 44% were tested around two years of age (18 to 36 months) and only 35% were tested at both one and two years of age. This indicates that many providers are testing children at one year but not two years of age as recommended. Blood lead screening statistics are available at the county scale through the MDH Data Access Portal's Childhood Lead Exposure (https://data.web.health.state.mn.us/web/mndata/lead) page.

Childhood Blood Lead Screening Guidelines for Minnesota

Blood Lead Testing by Age Group

Recommendations for Blood Lead Testing by Age Group

<table>
<tr><th colspan="5">All Children 0–17 Years</th></tr>
<tr><td colspan="5">

Any child that a parent or guardian expresses concern about lead exposure, or asks for their child to be tested for lead poisoning, should receive a blood lead test.
If the health care provider becomes aware of changes in possible lead exposure or risk factors in a child, the child should receive a blood lead test.
Newly arrived refugees should be tested upon arrival and 3–6 months after initial blood lead test. Additional tests may be warranted based on risk questionnaire.
When doing a blood lead test, follow sample collection procedures identified by the CDC Steps for Lead Testing (https://www.cdc.gov/biomonitoring/pdf/Lead_Fingerstick_Poster-508.pdf).

For capillary samples, make sure to wash the patient's hands with soap and water before taking a sample.

</td></tr>
<tr><th>Newborns</th><th>9–15 Months</th><th>18–24 Months</th><th>25 Months–
5 Years</th><th>6–17 Years</th></tr>
<tr><td>If a parent has a blood lead level (BLL) ≥ 5 µg/dL during pregnancy or while breastfeeding, refer to the MDH Blood Lead Level Guidelines (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html) for Pregnancy & Breastfeeding.</td><td>All children should receive a blood lead test between 9–15 months of age (recommended 12 months).</td><td>All children should receive a blood lead test between 18–24 months of age (recommended 24 months).</td><td>Children should receive a blood lead test if they did not receive a blood lead test ≤ 24 months OR if they meet criteria for a blood lead test based on risk questionnaire (see below).</td><td>Children should receive a blood lead test if they meet criteria for a blood lead test based on risk questionnaire (see below).</td></tr>
<tr><td colspan="5">ALL BLOOD LEAD TESTS ARE REQUIRED TO BE REPORTED TO THE MINNESOTA DEPARTMENT OF HEALTH (MDH) BY THE LAB OR CLINIC ANALYZING THE SAMPLE. HEALTH CARE PROVIDERS DO NOT NEED TO CALL MDH TO REPORT (UNLESS THEY SUSPECT A FAILURE TO REPORT PROPERLY).</td></tr>
</table>

* For blood lead screening for other populations, refer to MDH Blood Lead Level Guidelines (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html) for Pregnancy & Breastfeeding.

Risk Screening Questionnaire

Lead Risk Screening Questionnaire for Children 3–17 Years of Age

All children in Minnesota should receive a blood lead test at 12 and 24 months. Refer to blood lead screening guidelines.			
Questions for Children 3–5 Years of Age			
In the following questions, the "child" refers to the person getting screened for a blood lead test. If you are a parent or guardian, answer the following questions for your child.	**Yes**	**Don't Know**	**No**
Did the child miss their blood lead tests at 12 or 24 months?			
Since the child's last blood lead test has the child's sibling, housemate, or playmate been diagnosed with an elevated blood lead level (EBLL) greater than or equal to ≥ 5 µg/dL?			
Since the child's last blood lead test has the child moved to or started regularly visiting a home, childcare, or other building built before 1978?			
Has the child moved to Minnesota from a major metropolitan area within the last 12 months?			
Does the child's diet lack sources of iron or calcium?			
Has the child been diagnosed with low hemoglobin, low iron levels, or anemia?			
Questions for Children 3–17 Years of Age			
In the following questions, the "child" refers to the person getting screened for a blood lead test. If you are a parent or guardian, answer the following questions for your child. If you are a teenager filling this out for yourself, answer the questions for yourself.	**Yes**	**Don't Know**	**No**
Do you think the child may have been exposed to lead?			
During the last 12 months, did the child arrive in Minnesota from another country or spend significant time in another country?			
Does the child live in a house built before 1978 that is currently being renovated or has been renovated within the past 12 months?			
Does the child have any bullets in their body from past gunshot wounds?			
Does the child have any developmental disabilities?			
Does the child eat, mouth, or chew on any nonfood items, such as clay, soil, paint chips, painted wood, keys, fishing sinkers, jewelry, or antique furniture or toys?			
Does the child eat venison or other game that was harvested with lead bullets?			
Does the child eat candy (like chili or tamarind) or spices (like turmeric, chili, or curry) from other countries, especially spices purchased in bulk?			
Does the child eat food cooked or served in handmade, imported, or terra cotta pottery, cookware, or leaded crystal?			
Does anyone in the household use any traditional or cultural medicines?			
Does anyone in the household use any traditional or cultural cosmetics such as kohl, kajal, surma, sindoor, or thanakha?			
Does anyone in the household have an occupation, hobby, or activity that involves lead exposure? See below list for examples.			
If the answer "Yes" or "Don't Know" to ANY of the above questions, the child should receive a blood lead test. Children should be tested if they or their parents/guardians have any concerns about lead not addressed here.			

Examples of Lead-Related Hobbies, Occupations, and Industries

- Manufacturing: lead, batteries, bullets, fishing sinkers, ceramics, electrics, cable, wire, industrial, glass, paint, plastic, rubber
- Shooting teams, hunters, firing range users and workers, gunsmiths, police officers, armed forces
- Painters, remodelers, renovators, restorers, and refinishers of old buildings or antiques
- Auto repair, plumbers and pipe fitters, radiator repairers, welders, splicers, shipbuilders
- Recycling: metal, glass, electronics, and batteries, solid waste incinerators
- Artists (Painting, Ceramics, Pottery, Jewelry, Stained Glass, Printmaking)
- Construction and demolition work, lead abatement workers

Follow-Up Blood Lead Testing

Follow-up Blood Lead Testing

Follow-Up Blood Lead Testing
▪ If blood lead test result was < 5 µg/dL for either a blood lead test on a capillary or venous sample, no further testing is needed until the next time they are scheduled to receive a blood lead test according to the above screening guidelines, or if their risk factors change.
▪ If blood lead test was done on a capillary sample and the blood lead level (BLL) was elevated (≥ 5 µg/dL), confirm with a venous draw as soon as possible and no later than: ▪ *Immediately* for BLLs ≥ 60 µg/dL, ▪ 48 hours for BLLs 45.0–59.9 µg/dL, ▪ 1 week for BLLs 15.0–44.9 µg/dL, ▪ 1 month for BLLs 5.0–14.9 µg/dL. ▪ If a clinic is unable to do a venous draw, refer the child to a laboratory or facility able to perform a venous draw.
▪ If blood lead test was done on a venous sample and the BLL was elevated (≥ 5 µg/dL), follow the MDH Blood Lead Level Guidelines (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html) for Childhood Blood Lead Treatment.

Collaboration with Public Health

Sharing Information with Public Health

Minnesota Statutes 144.9502, Subdivision 9, (https://www.revisor.mn.gov/statutes/cite/144.9502), along with (Minnesota Statutes 145A.04 Subdivision. 1 (https://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 BLLs, 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, tribal nation health department, or Community Health Board as well as MDH.

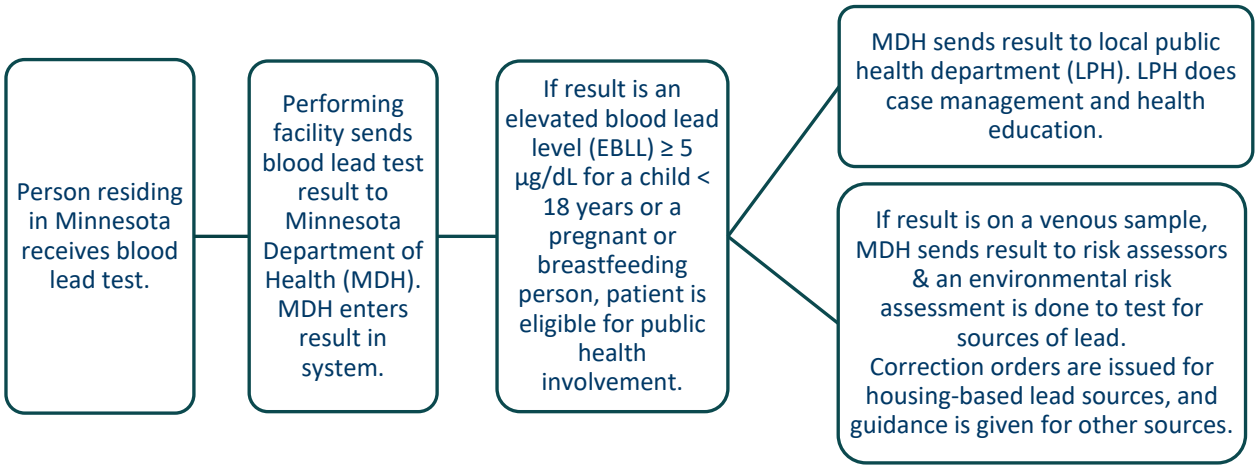
The ability of local public health departments to obtain and utilize blood lead analysis data and the associated epidemiologic data is crucial for fulfilling the responsibilities of an assessing agency under Minnesota Statutes 144.9504 and protecting and promoting the health of Minnesota residents.

Public Health Services

Once a person residing in Minnesota receives a blood lead test, the performing facility (the lab or clinic analyzing the sample) sends the blood lead test result to MDH. If a child had an EBLL, they are eligible for public health involvement and the child is referred to services automatically by MDH. For children, an EBLL greater than or equal to 5 µg/dL will automatically trigger involvement from a local public health department, and an EBLL on a venous result greater than or equal to 5 µg/dL will ensure an environmental investigation (risk assessment). The term local public health (LPH) is used throughout this document, and may refer to a Community Health Board, city or county public health department, or a tribal nation health department. While not required, tribal nation health departments have the right to access case data and may choose to provide services to children with EBLLs. *Figure 1: Process and Role of Public Health* outlines the process for public health services.

Health care providers do not need to contact MDH or LPH departments to report BLLs or to request services for children with EBLLs unless they suspect a failure to report properly. Health care providers are welcome to contact MDH to check on the status of a case, request to be connected with a local public health agency, or consult on likely sources of lead exposure (see Technical Assistance and Communication section on page 19).

Figure 1: Process and Role of Public Health



Case Management

When MDH receives an EBLL for a child, it is sent out to the relevant LPH department. See *Figure 1: Process and Role of Public Health* for the public health process. Depending on the location, this may be the city, county, or tribal public health department or the Community Health Board serving that county or community. A LPH staff member, 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 BLL, 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.

Environmental Investigations (Risk Assessments)

When a child under 18 years of age has an EBLL (≥ 5 µg/dL) on a venous sample, an environmental investigation, or a risk assessment, is performed. An environmental risk assessment is an investigation to determine the existence, nature, severity, and location of lead hazards. A licensed risk assessor goes to the primary residence and other locations a child spends significant amounts of time to test for lead. Current risk assessing agencies in Minnesota include MDH, the Minneapolis Health Department, and Saint Paul – Ramsey County Public Health. Health care providers do not need to call to request risk assessments for patients with an EBLL (≥ 5 µg/dL) on a venous sample; MDH sends results to risk assessing agencies automatically.

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 with a venous BLL of at least 5 µg/dL.
  - Environmental risk assessments can be performed at the primary residence and other facilities where the child spends more than a few hours a week.
  - Risk assessments can be done at other locations where lead hazards are suspected in addition to homes, child care facilities, playgrounds, and schools. Under some circumstances, risk assessments can also be performed at residences where the child no longer lives.
    - 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 residence to the MDH commissioner for follow up.
  - Environmental risk assessments are completed within 20 business days of the first qualifying venous BLL ≥ 5 µg/dL being received by the assessing agency.
- 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.

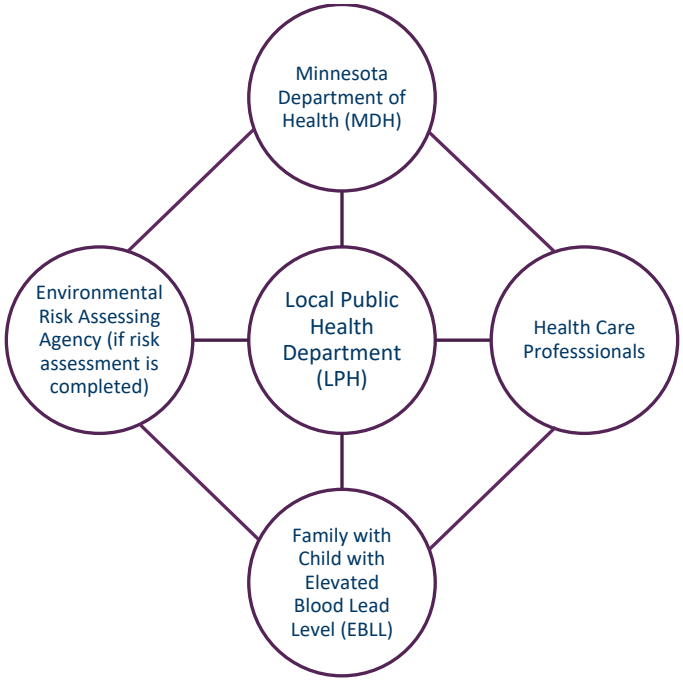
- If an environmental risk assessment is performed, it is the responsibility of the licensed risk assessor to follow the property until it passes clearance inspection. In order to pass clearance inspection, the affected property must have no deteriorated lead paint and no bare soil or lead dust exceeding soil or dust standards.

Technical Assistance and Communication

MDH offers guidance to and answers questions from health care providers, local public health, and others regarding blood lead testing and elevated blood lead case management. If health care providers have questions about case management or environmental risk assessments, or have any information to share that may be relevant to addressing the lead exposure, they are encouraged to contact MDH or the relevant LPH department. Staff at MDH as well as LPH staff typically work standard business hours and will respond to messages as soon as they are able.

Figure 2: Communication Pathways 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 BLL. MDH may have information regarding sources of lead identified in environmental risk assessments and LPH notes, and can share relevant information or questions from health care professionals with local public health or environmental risk assessors.

Figure 2: Communication Pathways



Specific Populations

Refugees

All refugees less than 17 years of age should receive a blood lead test upon arrival in Minnesota according to the MDH Domestic Refugee Health Screening Guidance: Blood Lead Screening (MDH Domestic Refugee Health Screening Guidance: Blood Lead Screening (https://www.health.state.mn.us/communities/rih/guide/9lead.html#1)) and the CDC Screening for Lead during the Domestic Medical Examination for Newly Arrived Refugees (https://www.cdc.gov/immigrantrefugeehealth/guidelines/lead-guidelines.html). Refugees should be retested three to six months after initial blood lead test, regardless of their initial BLL.

As refugees get settled, they move to different residences, so more testing may be warranted according to results of risk questionnaire. If the setting where an initial blood lead test takes place is not the primary care clinic for the refugee, primary care connection should be ensured for the recommended follow-up blood lead tests. Clinic workflows and order sets should be reviewed to ensure follow up for refugees. For other newcomers to the United States including asylees, humanitarian parolees, and undocumented immigrants, health professionals should follow the refugee blood lead screening guidance.

Children Receiving Medical Assistance or Minnesota Care

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 (Child and Teen Checkups (state.mn.us))
- MDH Child and Teen Checkups Fact Sheets (https://www.health.state.mn.us/people/childrenyouth/ctc/factsheets.html)
- 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)

Sources of Lead

Health care 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. MDH can provide additional information or technical assistance when unusual or newly emerging lead sources are suspected. Educational materials on specific lead sources can be

found at Lead Fact Sheets and Brochures (https://www.health.state.mn.us/communities/environment/lead/fs/index.html), including a Common Sources of Lead (https://www.health.state.mn.us/communities/environment/lead/fs/common.html#Common) fact sheet. This fact sheet contains a summary of common housing and non-housing sources of lead exposure, and tips for reducing lead in the home.

Paint and Dust

- Chipping or peeling paint is the most common source of lead exposure. Homes built before 1978 may contain lead-based paint.
  - 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 BLL have hazardous lead paint in their home.
  - Lead paint exposures can occur at home, daycare, or a relative's home.
- Window components and porches are common areas to find lead-based paint.
  - Other areas include walls, floors, doors, door frames, bannisters, baseboards, and antique bathtubs.
- Even tiny amounts of dust from lead paint can cause a child's BLL to rise. Friction surfaces such as windows or doors can wear off lead paint into lead dust even when the paint is not obviously chipped.
  - A teaspoon of lead dust in an entire home is enough to cause a child to have EBLLs.
- Cleaning Up Sources of Lead in the Home (https://www.health.state.mn.us/communities/environment/lead/fs/cleaningup.html) 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 BLLs 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 homes built before 1978. Information on lead-safe work practices is available at (Remodeling the Older Home (https://www.health.state.mn.us/communities/environment/lead/home/remodel.html).
  - MDH Hiring a Contractor (https://www.health.state.mn.us/communities/environment/lead/home/howhire.html) has information on hiring a contractor and certifications for different types of renovation or lead removal work.
    - Federal law requires that all contractors performing renovation work in pre-1978 residences to be certified. Use the EPA Locate Certified Renovation and Lead Dust Sampling Technician Firms (https://cfpub.epa.gov/flpp/pub/index.cfm?do=main.firmSearch) database to find firms with a Renovation, Repair, and Painting (RRP) certification.

- For lead abatement or lead removal work, a certification from MDH is required. Contractors and consultants that are certified for lead abatement may be found at MDH: Lead Poisoning Prevention: Find a Contractor or Consultant (https://lead.web.health.state.mn.us/searchFirm.jsf).

Soil and Water

Soil

- Bare soil can be a source of lead, especially in areas near busy streets or old homes.
  - 30–40% of Minnesota children with a high BLL 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 EBLLs 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.
  - 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. All private wells should be tested for lead at least once. Local jurisdictions (cities or counties) may have free or discounted water testing available; this varies from jurisdiction to jurisdiction. Well Testing, Results, and Options (https://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 (https://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 (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 chilies, curry powder, or various spice mixes
- Imported candy from multiple countries have also been found to contain lead, especially candies containing tamarind or chili.

Other Food Products

- Game meat harvested with lead ammunition

  - Lead bullets can fragment extensively; 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, handmade, or terra cotta pottery, ceramics, or other cookware with a lead glaze may contain lead that could leach 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:
  - Southeast Asian, South Asian and Indian Communities:
    - Sindoor 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.

        - Thanakha is a yellow-white creamy cosmetic used for traditional decorative makeup and skin lightening.
    - 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 are Hindu traditional medicines and have many names and a variety of forms and uses.
        - 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.

Developmental Disabilities and Pica Behavior

- Pica is the deliberate ingestion of nonfood items, which 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, plaster, or sheetrock
- If pica behavior is identified, it should be managed to prevent exposure to substances containing lead.
- Many children with developmental disabilities have pica behavior at older ages then children not diagnosed with developmental disabilities.

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
  - 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 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 (https://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.

Resources

Minnesota Department of Health Resources

Contact Information

MDH 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 (https://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: 651-201-4909 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://www.health.state.mn.us/communities/environment/lead/fs/index.html) contains educational materials about lead exposure and prevention in 15 different languages. Printed materials may be ordered through an order form on this page or viewed online.

Guidelines

In addition to this document, MDH has developed and periodically updated Blood Lead Level Guidelines (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html) for lead. These are available on the 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 (https://www.health.state.mn.us/communities/environment/lead/index.html).

Additional Resources

Many local public health departments help families with the additional resources below, but partnership with primary health care providers can improve outcomes for families.

Help Me Connect Website

Minnesota Help Me Connect (https://helpmeconnect.web.health.state.mn.us/HelpMeConnect) helps pregnant and parenting families and guardians with young children birth to 8 years of age connect to services in their local communities that support healthy child development and family well-being. Help Me Connect is a joint initiative between Minnesota's Departments of Education, Health and Human Services, and the Governor's Children's Cabinet. Help Me Connect includes resources and services that promote healthy prenatal and early childhood development, education, safety and well-being of children and families. It includes non-profits, for-profits (licensed by the state of Minnesota) and government agencies.

Medical

- Medical assistance programs
  - Navigators for medical assistance enrollment can be found at MNsure: Find Free Help Near You (https://www.mnsure.org/help/find-assister/).
- Transportation assistance to medical appointments
- Family home visiting

- Some families may qualify for LPH family home visiting services to help improve their health and well-being, depending on local resources.

Learning and Developmental

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. Assessments may be performed by the health care provider, or the child may be referred to a local community program that administers developmental screening tests
  - For advice on specific tests, go Developmental and social-emotional screening of young children (0-5 years of age) in Minnesota (https://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, guardians, or LPH can make referrals. Children can be referred at any BLL. More information and local contacts can be found at Follow Along Program (https://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 venous BLL ≥ 45 µg/dL are automatically eligible for Help Me Grow. Children with a venous BLL ≥ 15 µg/dL should be referred for an evaluation to determine eligibility for Help Me Grow.
  - Children with any BLL who are showing signs of developmental delays may also be eligible for Help Me Grow.
  - Anyone can make referrals to Help Me Grow, including health professionals. Referral information can be found at Help Me Grow: How to Refer (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 (education.state.mn.us/MDE/fam/elsprog/start/).

Nutritional Assistance

- 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 (www.health.state.mn.us/wic/) or at 1-800-WIC-4030 (1-800-942-4030)
- Supplemental Nutrition Assistance Program (SNAP): 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)

- 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/).

Lead in Housing

There are resources available for individuals doing work on homes or looking to hire a contractor to address sources of lead in housing.

- MDH Homeowner Information (https://www.health.state.mn.us/communities/environment/lead/home/index.html)
  - Site includes information about testing for lead, safely doing renovation work, and hiring licensed contractors.
- City of Minneapolis: Training Descriptions and Providers: Lead Safe Work Practices Training (https://www2.minneapolismn.gov/resident-services/property-housing/healthy-homes/lead/training-descriptions-providers/)
  - Lead safe training courses are designed for owner-occupied property owners whose intent is to do maintenance and remodeling projects on homes built prior to 1978.

Other resources may be available for addressing lead in housing, including services for both short-term and long-term lead abatement. These resources may be dependent on a risk assessment being completed and housing-based sources of lead being identified.

Other Resources

- Many medical clinics have their own social services systems and resources.
- For additional resources regarding housing or legal help, please refer to the Childhood Blood Lead Case Management Guidelines for Minnesota: Reference Manual (https://www.health.state.mn.us/communities/environment/lead/prof/guidelines.html#case).

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.

Blood lead reference value (BLRV): A measure used by the CDC that is based on the 97.5th percentile of the blood lead distribution in U.S. children ages 1–5 years from the most recent two cycles of data from the National Health and Nutrition Examination Survey (NHANES).

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 EBLLs to assess needs and facilitate access to needed resources.

Community Health Board (CHB): The legal governing authority for local public health in Minnesota. Community Health Boards serve at least 30,000 people, and can include one county/jurisdiction or multiple neighboring counties/jurisdictions.

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 five 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 MDH.

Lead risk assessing agency: An agency that performs lead risk assessments or lead inspections with lead risk assessors who has been licensed by MDH.

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, Community Health Board, or tribal nation that is working with an individual with an EBLL.

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 Poison Control: 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 EBLLs.

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 Nation health department: The public health department or agency of a Tribal Nation that is working with an individual with an EBLL.

U.S. Centers for Disease Control and Prevention (CDC): A U.S. federal government agency whose mission is to protect public health. The CDC has a Childhood Lead Poisoning Prevention program.

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.