Lead

Disease Category: Toxic and Heavy Metals

Signs and Symptoms	Most children and adults exposed to lead have no obvious or immediate symptoms but are often asymptomatic. Testing for lead in blood in young children is often the only way to identify lead poisoning. Short-term high-level lead exposure may cause: • Metallic taste • Abdominal pain, nausea, vomiting • Diarrhea or constipation • Dehydration, headache, exhaustion, irritability, weakness • Appetite loss • Memory loss • Pain or tingling in hands or feet • Seizures • Encephalopathy • Blood lead levels above 100 ug/dL can result in death. Long-term lead exposure may cause: • Abdominal pain, nausea, constipation • Depression, irritability, mood changes • Forgetfulness and distraction • Increased blood pressure • Anemia • Peripheral neuropathy • Neurocognitive deficits • Gout • Kidney damage and/or dysfunction • Hearing loss Other symptoms of lead exposure: • Decreased lung function • Bone or tooth loss • Increased infections • Reproductive health problems in both men and women • Decreased fetal growth/low birth weight • Spontaneous abortion
Incubation	Not applicable
Case Classification	Confirmatory Laboratory Evidence: • Detection of lead in venous blood using GFAAS or ICP/MS at or above 3.5 µg/dL. • Detection of lead in two capillary blood specimens from a child <16 years old, collected within 12 weeks, at or above 3.5 µg/dL. Supportive Laboratory Evidence: • Detection of lead in a single capillary blood specimen from a child <16 years old at or above 3.5 µg/dL, OR

	• Detection of lead in two capillary blood specimens from a child <16 years old, collected after 12 weeks, at or above 3.5 µg/dL. Note: If specimen type is unknown, treat it as capillary for persons <16 years old and venous for those ≥16 years old.
Differential Diagnosis	Lead poisoning can be misdiagnosed for attention-deficit disorder, growth failure, developmental delays, and other behavior disorders. Lead toxicity can be determined by a blood test.
Treatment	An environmental assessment should be done to evaluate for the presence and potential risks associated with lead contamination, including but not limited to soil, dust, paint, and water. Additionally, lead education and prevention to remove exposure to lead, sometimes chelation therapy and/or nutritional interventions to minimize lead absorptions and prevent pica.
Duration	Symptoms usually persist and evolve if no action is taken to decrease lead levels in the blood.
Exposure	Ingestion, inhalation, rarely transdermal absorption or transplacental/endogenous exposure.
Laboratory Testing	Local Health Authority can arrange testing if an environmental exposure is suspected OR for other persons potentially exposed: • NSPHL resources • Sample Collection

Key Partner Agencies	• Nevada State Public Health Lab (NSPHL)
	• Southern Nevada Public Health Laboratory (SNPHL)
	• Centers for Disease Control and Prevention (CDC)
	• Local Health Authorities:
	  ○ Carson City Health and Human Services (CCHHS)
	  ○ Central Nevada Health District (CNHD)
	  ○ Northern Nevada Public Health (NNPH)
	  ○ Southern Nevada Health District (SNHD)
	  ○ State of Nevada, Office of State Epidemiology (OSE)
	• Nevada Childhood Lead Poisoning Prevention Program (NvCLPPP)
	• State of Nevada Environmental Health Section
	• Nevada Division of Environmental Protection
	• Nevada Department of Education
	• Nevada Division of Industrial Relations
	• University of Nevada, Las Vegas (UNLV)
	• United States Environmental Protection Agency (EPA)
	• Western States Pediatric Environmental Health Specialty Unit (PEHSU)

Public Health Actions	Blood lead level (BLL) test results for children under 18 years of age must be submitted to the Local Health Authority (LHA) as soon as practicable after conducting the test. In accordance with reporting requirements for notifiable conditions defined in NAC 441A.225, providers are requested to report blood lead test results during the regular business hours of the health authority on the first working day following the receipt of the lab result.

	Nevada law not only requires reporting of lead test results, but also empowers public health authorities to investigate and respond to such cases. These investigations are compulsory when exposure is suspected and must be relayed to the Office of State Epidemiology. For individual confirmed or suspected cases: • Identify potential exposures • Identify potential outbreaks from common sources • Provide education about how to prevent exposure LHA to notify the Office of State Epidemiology (dpbhepi@health.nv.gov) if a cluster is suspected.

TABLE OF CONTENTS

LEAD

I. DISEASE REPORTING

A. Purpose of Reporting and Surveillance (1)

1. To identify lead toxicity in children as early as possible to minimize adverse effects.
2. To identify and remove sources of lead exposure.
3. To identify possible clusters related to shared lead exposures.
4. To educate affected individuals about how to reduce their risk of exposure to lead.
5. To better characterize the epidemiology of lead exposures in Nevada.

B. Legal Reporting Requirements

Healthcare providers are encouraged to conduct blood lead level (BLL) testing for all children in accordance with guidelines from the Centers for Medicare and Medicaid (2). BLL testing is required for all children enrolled in Medicaid and should be conducted when the child:

- Reaches 12 and 24 months of age; or
- At least once between 24 to 72 months of age if they have not previously been tested.

BLL testing can be performed using venous or capillary blood specimens. NRS 442.700 requires that elevated blood lead levels (≥ 3.5 ug/dL) identified in a capillary specimen must be confirmed with a venous specimen as soon as practicable after the initial result is obtained.

Per NRS 442.700 , all results of BLL tests conducted in children under 18 years of age must be reported to the LHA. A report to the health authority may be made by telephone; telecopy, in the form prescribed by the health authority; or any form of electronic communication identified by the health authority, in the form and manner specified by the health authority (see Appendix A for contact information). (2)

Providers should report through Electronic Laboratory Reporting (ELR) or use the Nevada Confidential Morbidity Report Form.

1. Health Care Providers and Health Care Facilities

- Where to report:
  - Notifiable to the LHA having jurisdiction where the health care facility or office of the health care provider is located (see Appendix A). (3) (4)
- Timeframe to report:
  - NRS 442.700 requires that results of BLL tests conducted in children under 18 years of age be reported to the appropriate health authority as soon as practicable after conducting the test.

- In accordance with reporting requirements for other notifiable conditions defined in NAC 441A.225, providers are requested to report blood lead test results during the regular business hours of the health authority on the first working day following the receipt of the lab result. (5)

2. Laboratories

- Where to report:
  - For laboratories located in Nevada: BLL test results are notifiable to the health authority having jurisdiction where the office of the health care provider who ordered the test is located or to an electronic clearing house approved by the health authority. (6)
  - For laboratories located outside of Nevada performing testing on specimens collected in Nevada or from residents of Nevada: Results indicating lead are notifiable to the Chief Medical Officer (6). In practice, reporting to the Chief Medical Officer occurs via the Office of State Epidemiology.
- Timeframe to report:
  - NRS 442.700 requires that results of BLL tests conducted in children under 18 years of age be reported to the appropriate health authority as soon as practicable after conducting the test.
  - In accordance with reporting requirements for other notifiable conditions defined in NAC 441A.225, please report blood lead test results during the regular business hours of the health authority on the first working day following the receipt of the lab result. (5)

3. Local Health Authority

- The LHA should complete the State of Nevada Confidential Morbidity Report Form (available at https://nvose.org/report-a-case/) for each case of lead reported in its jurisdiction.

C. Local Health Authority Investigation Responsibilities (7)

Nevada law not only requires reporting of lead test results (particularly those ≥ 5 µg/dL) but also empowers public health authorities to investigate and respond to such cases. These investigations are compulsory when exposure is suspected and must be relayed to the Office of State Epidemiology. If available resources for these services are limited, case investigation and management activities should be prioritized for children under the age of 18 and pregnant people with BLL above the CDC reference value.

II. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent (8) (9)

B. Lead is a natural element found in the environment, including in air, soil, and water, and it can be toxic to humans and animals. It has been used for a variety of purposes since ancient times, including in products such as gasoline, paint, plumbing pipes, ceramics, solders, batteries, and cosmetics. Sources of lead exposure include lead-based paint in homes, soil or dust near industries or roadways, plumbing leachate, occupational or hobby-related activities, and various lead-containing or contaminated products. Examples of these products include certain ceramic ware, cosmetics, folk remedies, traditional medicines, imported toys, jewelry, and spices. Description of Illness (9) (10)

Lead toxicity can produce a variety of symptoms and health effects in both children and adults, and the effects may vary markedly between different exposure types, blood levels, and with age.

Absorption depends on the form of the lead and the route of exposure. Ingestion and inhalation are the typical routes of lead exposure. The most common source of lead exposure is ingestion of lead-containing dust. The most dangerous lead exposure is to lead vapors (formed when lead is melted) or other respirable lead compounds.

Symptoms of lead toxicity can result rapidly after acute exposures or can develop insidiously over time.

- In children, the most serious symptoms are found in the central nervous system, with subtle effects (e.g., neurocognitive deficits) occurring at lower levels and severe effects (e.g., seizures, encephalopathy) occurring at higher levels. These neurocognitive deficits can include decreased IQ, learning disabilities, attention difficulties, and behavioral challenges such as hyperactivity, impulsivity, and emotional regulation issues, which may contribute to academic struggles and social difficulties. Lead toxicity can also affect kidney function, cause gastrointestinal symptoms (e.g., abdominal pain, vomiting, and constipation), interfere with vitamin D and calcium metabolism, and can sometimes contribute to anemia in children. The impact on brain development is particularly concerning, as lead exposure can cause irreversible damage, leading to long-term cognitive and behavioral challenges that persist into adolescence and adulthood (11).
- In adults, acute signs and symptoms following high exposures to lead might include gastrointestinal symptoms (e.g., abdominal pain, constipation, anorexia), joint or muscle pains, excessive fatigue, sleep disturbance, decreased libido, headache, difficulty concentrating, deficits in short-term memory, irritability, depression, and, in extreme cases, encephalopathy, seizures, and persistent cognitive impairment after recovery. Chronic exposure may produce a variety of health problems, including neurologic effects (e.g., cognitive decline, peripheral neuropathy), psychiatric effects (e.g., anxiety, depression), anemia, hypertension, nephropathy, fertility issues (e.g., reduced sperm count or function), cardiovascular diseases, immune dysfunction,

and bone or joint disorders. In pregnant women, lead exposure can be associated with reduced fetal growth, lower birth weight, or spontaneous abortion.

Absorbed lead is detectable in blood, soft tissue, and bone. The half-life of lead varies from about one month in blood, 1-1.5 months in soft tissue, and about 25-30 years in bone. This is pertinent because lead in bone can be released if the bone is reabsorbed for various reasons.

For the purpose of these guidelines, persons with BLLs at or above 3.5 µg/dL are considered to have lead poisoning, regardless of symptoms. The CDC's blood lead reference value is specifically for children, as it is derived from children's blood lead levels based on NHANES data. For adults, most sources define lead poisoning at a higher threshold, typically 10 µg/dL.

C. Epidemiology (9) (13) (14)

Health effects of lead toxicity are often non-specific and difficult to measure, making BLL testing a crucial tool to identify affected children and adults. BLL test data also provide value for measuring the prevalence of elevated BLLs within a population as a proxy measure for lead toxicity, however these data are highly dependent on testing and reporting practices.

Data compiled through the National Institute for Occupational Safety and Health Adult Blood Lead Exposure Surveillance (ABLES) program shows a decrease in the estimated national prevalence rate of Elevated Blood Lead Levels in adults (EBLLs) from 1994 to 2022 (15). Similarly, a CDC analysis (16) published in 2013 found an overall reduction in the proportion of children with BLLs ≥5 µg/dL. This is likely due to national bans on leaded gasoline and use of lead-based paint in residential buildings in 1996 and 1978, respectively (17) (18).

Nevertheless, the potential for childhood exposure to lead remains high, particularly due to the stability of lead in the environment, usage of lead in numerous industrial applications and widespread use of lead-based paint in older housing. In Nevada, nearly 25 percent of homes were built before the 1978 ban on lead-based paint, presenting a potential risk to nearly 300,000 households (18) (19).

1. Data

To view current childhood lead poisoning data for Nevada, visit Nevada Childhood Lead Poisoning Prevention Program's Dashboard. NVCLPPP also publishes reports on the current lead data.

2. Seasonality (20) (21)

Historic trends have suggested lead levels to increase in summer months as opposed to winter months.

Risk Factors (8) (9) (22)

Risk factors for lead exposure include:

- Age: Children, especially children between ages six months to three years, are at higher risk than adults.
- Additionally, children with disabilities may have increased hand-to-mouth behaviors beyond 6 years of age and may also have pica

- Racial/ethnic minorities: Non-Latino Black children have higher average BLLs compared to non-Latino White children, and a higher percentage of Latino children have EBLLs compared to the general population. Children in refugee and immigrant populations may also be at increased risk of EBLL due to various possible exposures in their home countries and exposure related to poverty in the United States.
- Poverty: Children living in low-income housing have been found to be more likely to have EBLL compared to children living in homes with higher property values. Additionally, children enrolled in WIC and Medicaid have been found to be at higher risk for EBLL than children not enrolled in those programs.
- NvCLPPP has identified zip codes at higher risk for lead exposure using a lead exposure risk index (LERI)

For more information about risk factors, please see the NvCLPPP Blood Lead Testing Plan.

D. Sources and Routes of Exposure (9) (23)

While deteriorating lead-based paint in older homes remains a significant source of lead exposure for children in the United States, especially in residences built before 1978, it's important to recognize that other sources also contribute to lead poisoning, particularly on the West Coast. Recent studies have highlighted that up to 38% of childhood lead poisoning cases are linked to consumer products, including imported items such as toys, jewelry, cosmetics, and certain foods. In California, data from 2018-2019 indicated that 37.1% of lead exposure cases in children were attributed solely to non-housing sources, with an additional 10.7% linked to both housing and non-housing sources. These non-housing sources encompass items like imported candies, spices, ceramics, and certain traditional remedies. Given this diverse range of exposure pathways, it's crucial to adopt a comprehensive approach to lead poisoning prevention that addresses both environmental and consumer product-related sources. Among adults with known lead exposures and blood lead levels (BLLs) of 10 µg/dL or more, about 90% had occupational exposure. Occupational exposures include manufacturing (e.g., storage battery manufacturing; non-ferrous metal foundries and processing; alumina and aluminum production and processing), construction (e.g., painting and wall covering contractors; highway, street, and bridge construction; residential building construction), mining, metal recycling, smelting operations, plumbing, and certain types of demolition work.

Common Sources of Lead Exposure

Today, one of the most common sources of lead exposure among U.S. children is deteriorating lead-based paint in older homes. Lead-based paints were banned for residential use in 1978, but homes built before this time—an estimated 25% of homes in Nevada—still pose a risk of lead exposure through lead-contaminated dust and paint chips (24, 25). However, exposure is not limited to older housing. Other sources—including imported consumer products, occupational and para-occupational exposures, and certain hobbies—are increasingly recognized as contributors to elevated blood lead levels. To better capture the full range of potential hazards, lead exposure sources can be categorized as follows:

- Housing & Environmental Sources
    - Deteriorating lead-based paint in homes built before 1978
    - Lead-contaminated dust and soil
    - Water from lead pipes or plumbing components
- Consumer Products & Imported Goods

    - Spices, candies, and food products
    - Ceramics, dishware, and cookware with lead-based glazes
    - Cosmetics such as kohl, surma, and sindoor
    - Jewelry and toys containing lead
    - Vinyl products such as blinds and artificial Christmas trees
- Occupational & Take-Home Exposures
    - Construction, painting, renovation, and demolition work
    - Manufacturing (e.g., batteries, metalwork, electronics)
    - Welding, radiator repair, and auto mechanics
    - Lead residue carried home on clothing, shoes, skin, or hair
- Hobbies & Recreational Activities
    - Making or restoring stained glass and ceramics
    - Shooting firearms or spending time at firing ranges
    - Fishing using lead sinkers or lures
    - Jewelry making with lead solder
    - Hunting and consuming game harvested with lead ammunition
- Cultural & Herbal Practices
    - Certain folk remedies (e.g., litargirio, greta, azarcon)
    - Traditional herbal medicine, including some Ayurvedic and Chinese medicine products
    - Distilled alcohol (e.g., moonshine) made using lead-contaminated equipment

Given the growing number of exposure pathways beyond housing, comprehensive lead prevention efforts must address both environmental and consumer product-related risks while incorporating culturally inclusive language and practices.

III. EPIDEMIOLOGIC CASE INVESTIGATION

Nevada law not only requires reporting of lead test results (particularly those ≥ 5 µg/dL) but also empowers public health authorities to investigate and respond to such cases. These investigations are compulsory when exposure is suspected and must be relayed to the Office of State Epidemiology. If available resources for these services are limited, case investigation and management activities should be prioritized for children under the age of 18 and pregnant people with BLL above the CDC reference value.

A. Step 1: Review relevant information about the disease.

1. Review lead case definition (2024 CDC). (27)

A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance. Surveillance case definitions enable public health officials to classify and count cases consistently across reporting jurisdictions. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient's health needs.

a) Clinical Criteria

Not applicable

b) Laboratory Criteria for Diagnosis (27)

Confirmatory laboratory evidence:

- Detection of lead in a venous blood specimen, tested by graphite furnace atomic absorption spectrometry (GFAAS) or inductively coupled plasma mass spectrometry (ICP/MS), that is at or above the reference value of 3.5 µg/dL.
- Detection of lead in two capillary* blood specimens from a child less than 16 years old at or above the reference value of 3.5 µg/dL that are collected within 12 weeks of each other.

** If specimen type is unknown, it should be considered capillary for persons <16 years of age and venous for persons ≥16 years of age, for the purpose of case classification.*

Supportive laboratory evidence:

- Detection of lead in a single capillary blood specimen from a child less than 16 years old that is at or above the reference value of 3.5 µg/dL, OR
- Detection of lead in two capillary blood specimens from a child less than 16 years old at or above the reference value of 3.5 µg/dL that are collected after 12 weeks of each other

c) Epidemiologic Linkage

Not applicable.

d) Criteria to Distinguish a New Case from an Existing Case (27)

Many individuals receive more than one blood lead test over time. Individuals who meet the confirmed case classification criteria should be counted as a case only once annually. To distinguish which are new cases to be enumerated annually from those that persist or recur for more than one year, the following should be applied:

- For children (less than age 16) and adults (age 16 years or older): A confirmed case based on a venous test should be enumerated once per calendar year as a new case if the case was not enumerated as a confirmed case in the previous calendar year.

OR

- For children (less than age 16): A confirmed case based on two capillary tests within 12 weeks of each other should be enumerated once per calendar year as a new case if the case was not enumerated as a confirmed case in the previous calendar year.
    - If the collection date of the second of the two capillary tests occurred in the subsequent calendar year, the case should be counted in the year of the first collection date.

e) Case Classification

Suspect:

Meets the supportive laboratory evidence.

Confirmed:

Meets the confirmatory laboratory evidence.

f) Comments:

Case definitions are used to classify and count cases consistently across jurisdictions for public health surveillance. They are not intended for clinical diagnosis or individual patient care.

B. Step 2: Begin investigating the case.

1. Contact Reporting Source and/or Reported Case

Upon receiving an initial case report, review lab test results and available clinical details and epidemiologic factors. Before initiating the investigation, contact the health care provider who initiated the case report/ordered the test to confirm the diagnosis and discuss the circumstances of the case or suspected case. If, after a reasonable effort, the disease investigator is unable to contact the health care provider before the time when an investigation must be initiated to protect the public health, the disease investigator may proceed with the investigation, including contacting the case or suspected case. (28)

Next, if necessary, contact the case or suspected case directly to conduct an interview to obtain additional data needed to complete the investigation.

Document all attempts to contact a reporting source and/or reported case.

2. Collect Data

a) Priority Data for Investigation of Lead Cases

Per NRS 442.700, health care providers are required to include the following variables when reporting BLL test results to public health. At minimum, these variables should be reviewed for completeness:

- The name, sex, race, ethnicity and date of birth of the child;
- The address of the child, including, without limitation, the county and zip code in which the child resides;
- The date on which the sample was collected;
- The type of sample that was collected; and
- The name and contact information of the provider of health care who ordered the test.

b) Step 5: If case investigation and management is pursued, please include the following:

- Obtain an exposure history: Obtain information on potential sources of lead exposure prior to diagnosis. Timing and duration of exposure can be important in determining whether a negative health effect may result. If the exposure is known, it is important to ask when it occurred, how long it lasted, and how often the child was exposed to lead (daily, weekly, monthly, etc.). It is also important to ask about the amount (29). Investigate possible exposure from household, occupational, environmental, or other sources. Ask patients about their living conditions, travel history, occupational environment, hobbies, and any other potential lead exposure. Some example questions to ask regarding possible exposures include:
  - Do you (or this child) live in or regularly visit a home built before 1978?
  - In the past year, have you (or this child) been exposed to repairs, repainting or renovation of a home built before 1978
  - Have you (or this child) traveled outside the U.S. or recently arrived from another country?
  - Have you (or this child) ever been to Mexico, Central or South America, Asian countries (i.e., China or India), or any country where exposure to lead

from certain items could have occurred (for example, cosmetics, home remedies, folk medicines or glazed pottery)?
    - Do you (or this child) live with someone who has a job or a hobby that may involve lead (for example, jewelry making, building renovation or repair, bridge construction, plumbing, furniture refinishing, or work with automobile batteries or radiators, lead solder, leaded glass, lead shots, bullets or lead fishing sinkers)?
    - At any time, has this child lived near a factory where lead is used (for example, a lead smelter or a paint factory)?
- Provide education: Patients should be counseled on how to minimize further exposure to lead. Please find resources that can be shared with patients and families in the EDUCATION/PREVENTION section of this document.
- Assess need for referrals:
    - Medical Care: If the patient does not have a primary care provider they should be encouraged to find one. Some available resources can be found here: Medical Assistance (nv.gov)
    - Children three years of age and under with disabilities or developmental delay: The Nevada Early Intervention Services (NEIS) System provides services to children birth until age three with developmental delay or disabilities and their families.
    - Children ages 3-21 with developmental delay or special health needs: Child Find aims to ensure that every child receives the best start in their educational journey. By focusing on early identification and referral, Child Find helps children be prepared for school. (775) 327-0685 (ext #2)
    - Nutrition education and financial support for pregnant women and families with children under five years of age: Nevada WIC
    - Financial support for low-income individuals and families needing assistance in purchasing food: Supplemental Nutrition Assistance Program (SNAP)

  If you encourage a patient or family to pursue any of these resources, please conduct a two-week follow-up call to assess if families have had trouble contacting the services.

- Identification of High-Risk Contacts: If resources allow, identify and evaluate household members or others, particularly children, who may have been exposed to the same lead sources. Coordinate referrals mentioned above for lead testing and intervention services if necessary. Information regarding lead exposure prevention and follow-up can be found on the CDC's Lead Poisoning Prevention website.
- Environmental Lead Investigations: For children with blood lead levels above the CDC reference value, environmental health (EH) investigations are critical to identify and mitigate sources of lead exposure. If the LHA lacks EH capacity, they should first contact the Nevada Childhood Lead Poisoning Prevention Program (NvCLPPP) at nvclppp@unlv.edu to determine if NvCLPPP has the capacity and funding to assist.

  If NvCLPPP is unable to provide support for an EH investigation, the LHA should notify OSE and then contact the Nevada Division of Environmental Protection (NDEP) to request assistance. NDEP serves as the primary point of contact for

these matters and will coordinate with the Environmental Protection Agency (EPA) if further support is necessary. LHAs should not contact the EPA directly to conduct EH investigation(s).

- Retesting with their provider every few months to ensure and document decreasing levels.

c) Quality Assurance

Disease Investigators must ensure all EpiTrax data entry is complete, including the State of Nevada Confidential Morbidity Report (CMR) Form and the Childhood Lead Investigation Questionnaire. The questionnaire is available at: https://www.nvclppp.org/resources/forms-guides/.

3. Special Considerations (9)

a) Pregnancy and lead

Lead exposure during pregnancy is especially problematic, as lead can cross the placenta and interfere with the normal development of the fetal brain. Pregnant people can be exposed to lead through all of the sources described previously, making it critical to minimize exposure as much as possible. Those who are pregnant or planning to become pregnant should take precautions to avoid lead exposure, including refraining from activities such as remodeling or repainting the baby's room or restoring old furniture, as these can disturb lead-based paint and create hazardous dust.

b) Routine blood lead testing is not recommended for all pregnant individuals; however, completing a lead exposure risk questionnaire during prenatal visits can help identify those at higher risk who may benefit from testing. Healthcare providers should offer anticipatory guidance to help reduce potential exposures and provide tailored recommendations based on an individual's risk factors.

c) Babies Affected by Lead

Parents should consult pediatricians and other healthcare providers immediately if they suspect their baby has been impacted by lead. This is crucial for assessing the extent of the impact and initiating appropriate medical care. Babies affected by lead should have regular check-ups to monitor their growth and development. These check-ups should include assessments for potential complications like developmental delays and other neurological or sensory issues. Ongoing developmental screenings can help identify delays or disabilities early, allowing for timely intervention and support. Early intervention can significantly improve outcomes for babies with developmental delays or disabilities.

C. Step 3: Notify working partners and begin necessary coordination.

1. Roles and Responsibilities

a) Partner Divisions/Programs (within DPBH)

Depending on the nature of the case/outbreak investigation, coordination with other DPBH divisions or programs may be warranted. These divisions/programs may include:

- Nevada State Public Health Lab (NSPHL) for lead testing

- State of Nevada, Environmental Health Section for guidance on where to seek environmental assessments
- Centers for Disease Control and Prevention (CDC) for guidance on lead prevention
- Southern Nevada Health District (SNHD), Central Nevada Health District, Northern Nevada Public Health, Carson City Health and Human Services for referring cases to the correct jurisdiction
- Nevada Division of Environmental Protection for guidance on where to seek environmental assessments
- Nevada Department of Education for resources on children with developmental disabilities due to lead exposure
- Nevada Division of Industrial Relations for occupational exposures
- United States Environmental Protection Agency (EPA) for lead risk assessments for families needing additional support in reducing exposure. One case is enough to pursue an assessment if the family is agreeable to an assessment and exposure cannot be determined.
- Nevada Childhood Lead Poisoning Prevention Program (NvCLPPP) for general information, free educational materials, and other resources.
- Western States Pediatric Environmental Health Specialty Unit (PEHSU) for medical consultation and a resource for families needing medical advice

Partner contact information may be found in APPENDIX A: PARTNER CONTACT INFORMATION.

D. Step 4: Analyze & disseminate data.

The Nevada Childhood Lead Poisoning Prevention Program (NvCLPPP) is a 5-year initiative funded by the Centers for Disease Control and Prevention (CDC) and implemented by the University of Nevada, Las Vegas (UNLV) School of Public Health, the Southern Nevada Health District (SNHD), and the Office of State Epidemiology (OSE).

The UNLV School of Public Health receives data submitted by OSE and SNHD. UNLV then analyzes monthly lead reports submitted by OSE and SNHD. UNLV disseminates the data through quarterly reports at the NvCLPPP quarterly advisory board meeting.

More information can be obtained by contacting *NVCLPPP@unlv.edu*.

IV. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL

N/A

V. TREATMENT/PROPHYLAXIS

A. Treatment of Case

Treatment and interventions may vary, but generally begins with educating the patient or family about lead exposures and removing or minimizing the source of lead exposure.

Repeat BLL testing is often recommended. Children with lead toxicity may have developmental delays and may be eligible for Early Intervention Services. They may also have concurrent iron deficiency or other nutritional needs. In some circumstances, chelation therapy may be indicated. Clinicians are encouraged to consult with a physician with expertise in managing childhood lead poisoning. Clinicians can contact the Western States Pediatric Environmental Health Specialty Unity (PEHSU) or the Rocky Mountain Poison Center for medical consultation.

- PEHSU: (415) 514-0878, or email pehsu@ucsf.edu
- Rocky Mountain Poison Center, Nevada: (800) 222-1222

VI. EDUCATION/PREVENTION

A. For cases & contacts (30) (31)

The investigator should provide educational materials for the prevention and control of lead to the person with elevated BLL or that person's parent/guardian.

In addition to providing the standard materials listed below, investigators should also engage families in discussions to ensure they understand the risks and strategies for lead prevention. Key talking points for investigators include:

- An overview of lead poisoning, including common sources of lead exposure, entry routes, associated health effects, and prevention strategies.
- A review of the child's BLL results, their significance, and follow-up testing recommendations.
- Guidance on nutrition, with a focus on foods rich in iron and calcium to reduce lead absorption. Providing specific examples of meals or handouts, such as those from WIC, can help families implement dietary changes.
- Education on personal hygiene practices, including frequent hand washing, showering after work, and washing work clothes separately to minimize exposure.

Finally, investigators should offer to send additional materials from the Nevada Childhood Lead Poisoning Prevention Program (NvCLPPP) to further support families.

Standard Materials for Cases and Contacts:

- Childhood Lead Exposure (Eng/Spa)
- After the Lead Test (Eng/Spa)
- Tips to Clean (Eng/Spa)
- How Lead Affects Children (Eng/Spa)

B. For the public (32)

The best way to prevent lead is to:

- Wash hands often
- Wash toys and pacifiers
- Wash work clothes separately
- Wash surfaces with a damp cloth when dusting
- Wash floors with a wet mop
- Mitigate children from putting their hands and toys in mouth
- Mitigate children from playing in dirt
- Mitigate children from being near remodeling projects
- Mitigate children from eating imported candies and snacks with high lead content
- Make sure to use cold water for cooking, drinking, and baby formula
- Make sure to let cold water run for 1 minute before using
- Make sure to leave shoes at the door before entering the home
- Make children's food high in iron and calcium
- Make sure to check the recall website (https://www.recalls.gov/ and https://www.cpsc.gov/Recalls) regularly and remove recalled items

For more information on how to prevent lead poisoning visit the NvCLPPP website on prevention.

The investigator should search for the most recent online public educational materials about the disease from the CDC.

VII. REFERENCES

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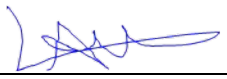
VIII. ACKNOWLEDGEMENTS

This document was developed based on the content and format of the disease investigation guidelines of several state and local health jurisdictions:

- Oregon Health Authority Investigative Guidelines
- Washington State Department of Health Reporting and Surveillance Guidelines
- Washoe County Health District Epidemiology and Communicable Disease Program Investigation of Communicable Disease Manual

The Nevada Office of State Epidemiology would like to acknowledge the work of these great partners.

IX. UPDATE LOG



Ihsan Azzam, Ph.D., M.D.
Chief Medical Officer

7/18/2025
Chief Medical Officer Approval Date

X. APPENDIX A: PARTNER CONTACT INFORMATION

Local Health Authorities in Nevada		
Carson City Health and Human Services (CCHHS) [Serving Carson City, Douglas, and Lyon County]	Disease reporting	(775) 887-2190 (775) 887-2138 (confidential fax)
	After-hours phone	(775) 887-2190
Central Nevada Health District (CNHD) [Serving Churchill, Mineral, Eureka, and Pershing County)	Disease Reporting	(775)866-7535 (877) 513-3442 (confidential fax)
Northern Nevada Public Health (NNPH) [Serving Washoe County]	Epidemiology and Public Health Preparedness (EPHP)	(775) 326-6055
	24-hour communicable disease reporting	(775) 328-2447 (775) 328-3764 (confidential fax)
Nevada Division of Public and Behavioral Health Rural Health Services [Serving Elko, Esmeralda, Humboldt, Lander, Lincoln, Nye, Storey, and White Pine County]	Disease Reporting	(775) 400-0333 (775)684-5999 (confidential fax)
Southern Nevada Health District (SNHD) [Serving Clark County]	Epidemiology	(702) 759-1300 (702) 759-1414 (confidential fax)
	STDs, HIV, and AIDS	(702) 759-0727 (702) 759-1454 (confidential fax)
	Tuberculosis	(702) 759-1015 (702) 759-1435 (confidential fax)
	After hours & public health emergencies	(702) 759-1100
DPBH Partners		
Environmental Health Section	Main office line	(775) 684-5280
External Agency Partners		

Nevada State Public Health Lab (NSPHL)	Administrative	(775) 784-6063
	Clinics/Patients	(775) 982-1000
Southern Nevada Public Health Laboratory (SNPHL)	Administrative	(702) 759-1020
University of Nevada, Las Vegas		(702) 895-1380
Nevada Childhood Lead Poisoning Prevention Program		North: (775) 453-0434 South: (702) 895-1040
United States Environmental Protection Agency	Region 9 Office	(415) 947-8000
Nevada Division of Environmental Protection		North: (775) 687-4670 South: (702) 668-3900
Nevada Department of Education		North: (775) 687-9115 South: (702) 486-6458
Nevada Division of Industrial Relations		North: (775) 684-7270 South: (775) 486-9000
Western States Pediatric Environmental Health Specialty Unit		(415) 514-0878

XI. APPENDIX B: OSE CONTACT INFORMATION

Nevada DPBH Office of State Epidemiology	
Disease reporting	(775) 684-5911 (775) 684-5999 (confidential fax)
After-hours duty officer	(775) 400-0333