

Lead Poisoning in Children <16 Years Old

A. Protocol Checklist

General activities

- Enter available information into Merlin upon receipt of initial report of blood lead level (BLL) result.
 - Electronic laboratory reporting (ELR) results: Merlin will automatically process ELR results and will associate the lab with an existing case or create a new case as appropriate. Cases with BLLs <10 µg/dL will be auto-reported.
 - Paper results: County Health Departments (CHDs) can complete data entry or fax to the State Health Office at 850-414-6894 for data entry. If the CHD completes data entry, ensure every result is entered as a lab in Merlin, regardless of BLL, and has an associated reported case.
- Investigate as appropriate (see [investigation recommendations](#) below).

Basic BLL investigation

- Additional investigation and follow-up are optional for cases with BLLs ≥5 and <10 µg/dL but should be conducted for cases with BLLs ≥10 µg/dL.**
- Interview the parent or guardian.
 - Assess environmental risk factors, previous lead exposure and treatment history if applicable, Medicaid status, symptoms, occupational status of household contacts, eating habits, behaviors, and housing situation and document collected information on the Merlin extended data screen. If the child is >6 years old, determine the reason for lead testing (e.g., concern that the child had a possible exposure to lead, including any specific or suspected source[s] of potential exposure), and assess as above.
 - Provide education about sources of lead, exposure pathways, nutrition, and housekeeping.
 - Recommend that household contacts and siblings <6 years old be tested.
- Provide recommendations to the health care provider for all children. Priority should be given to children <6 years old.
 - Refer pregnant women with BLLs ≥5 µg/dL to their gynecologist.
 - Recommend that the provider refer the child to Women, Infants, and Children (WIC) (FloridaHealth.gov/programs-and-services/wic/index.html) at 800-342-3556 or Children's Medical Services (CMS) (FloridaHealth.gov/programs-and-services/childrens-health/childrens-medical-services/index.html) at 866-799-5321, if needed.
- Provide confirmatory and follow-up testing guidelines and ensure they are followed (see [confirmatory testing](#) and [follow-up testing](#) section D). Refer to the Florida Department of Health (FDOH) Childhood Lead Poisoning Screening and Case Management Guide (FloridaHealth.gov/environmental-health/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf) for clinical guidance if needed. Consider developmental screenings and discuss long-term developmental follow-up with the parent/guardian.

Investigation for venous BLL ≥20 µg/dL or 2 venous BLLs ≥15 µg/dL >3 months apart

- Conduct a basic BLL investigation.
- Coordinate an environmental health investigation (see [environmental health investigation](#) section E). Document findings on the Merlin extended data screen.

Investigation for BLLs 45–69 µg/dL

- Conduct a basic BLL investigation.
- Advise health care provider to consult Florida Poison Control at 800-222-1222 about chelation therapy. If therapy is done, document treatment information on the Merlin extended data screen and upload medical records.
- Coordinate an environmental health investigation (see [environmental health investigation](#) section E) **within 48 hours of notification**. Document findings on the Merlin extended data screen.

Investigation for BLLs ≥70 µg/dL

- Children with BLLs ≥70 µg/dL constitute a medical emergency and must be hospitalized immediately. Upload medical records in Merlin.
- Advise health care provider to consult Florida Poison Control at 800-222-1222 about chelation therapy. If therapy is done, document treatment information on the Merlin extended data screen and upload medical records.
- Begin basic BLL investigation **within 24 hours of notification**, even on weekends.
- Coordinate an environmental health investigation (see [environmental health investigation](#) section E) **within 24 hours of notification**, even on weekends. Document findings on the Merlin extended data screen.

B. Disease reporting and epidemiology

Purpose of reporting and surveillance

1. Estimate the prevalence of elevated BLLs among children in Florida
2. Ensure appropriate and timely follow-up care of children with elevated BLLs
3. Prevent new cases and worsening of existing cases by early identification of lead exposure sources and risk factors.
4. Gather epidemiologic and environmental data on lead poisoning cases to target future public health interventions.

Legal reporting requirements

Lead poisoning is a reportable condition in Florida under Rule 64D-3.029, Florida Administrative Code. Local health care providers, laboratories, and public health professionals are required to report **all** BLL results to DOH. Electronic reporting of results is preferred.

- BLLs ≥ 5 $\mu\text{g}/\text{dL}$ must be reported to DOH by the next business day.
- BLLs < 5 $\mu\text{g}/\text{dL}$ must be reported to DOH within 10 business days.

CHD investigation and intervention responsibilities

1. Investigation for lead poisoning cases with a BLL ≥ 10 $\mu\text{g}/\text{dL}$ should begin the same day as notification.
2. Recommend blood lead testing for household contacts, especially children < 6 years old and pregnant women. All test results should be entered in Merlin.
3. Conduct an environmental assessment for children with a venous BLL of ≥ 20 $\mu\text{g}/\text{dL}$ or two venous BLLs ≥ 15 $\mu\text{g}/\text{dL}$ taken more than 12 weeks apart.
4. For BLLs ≥ 45 $\mu\text{g}/\text{dL}$, recommend health care providers call Florida Poison Control Center at 800-222-1222 for further consultation.

Causative agent

Lead, a heavy metal, does not break down and can accumulate in the body, causing serious and permanent health problems to people of all ages.

Illness

Childhood lead poisoning is a preventable, serious environmental health problem. Lead is recognized as one of the most common environmental toxins for young children. The primary way most children are exposed to harmful levels of lead is through contact with deteriorating lead paint and lead-contaminated dust. Young children absorb lead more efficiently than adults.

Lead poisoning can be acute or chronic. Acute lead poisoning occurs when an individual ingests or inhales a large amount of lead into the body over a short period of time. Chronic lead poisoning occurs when small amounts of lead are ingested or inhaled over a period of several months or years. Lead is a systemic toxin that affects virtually all body systems. Lead exposure is associated with a range of serious health effects among young children, including anemia, hearing loss, diminished skeletal growth, delayed pubertal development, dental caries, and impaired neurologic development.¹ Lead exposure is an important cause of preventable brain injury and neurodevelopmental dysfunction that is associated with detrimental effects on children's cognitive and behavioral development, including measurable declines in IQ. Even low levels of lead can cause adverse health effects in children.

Sources of lead exposure

Lead-based paint hazards

Lead-based paint found in older homes is still the most common source of lead exposure in the environment. As homes with lead-based paint age, the paint begins to deteriorate. Deterioration is exacerbated around friction surfaces, surfaces affected by weatherization, and areas exposed to leaks or other types of structural damage. The dust created when paint breaks down is easily accessible to children when it settles on floors or bare soil where they are likely to play. Renovation or construction work done in older homes containing lead-based paint or other leaded material (e.g., ceramic tile, pipes, or glass) can also create lead dust in the environment of a child.

Lead-based paint containing up to 50% lead was commonly used through the 1940s. The use and manufacture of lead-based paint declined during the 1950s and thereafter. Lead-based paint continued to be available for use in residential dwellings until 1978. Although it is difficult to determine the actual number of properties in Florida that contain lead-based paint hazards, 2016 U.S. Census Bureau data for Florida indicate that there are approximately one million housing units built before 1950 and three million housing units built before 1970. Interior dust can become contaminated with lead as the result of chipped or peeling paint in older dwellings (pre-1978 housing), friction caused by opening and closing windows with lead paint, or through the disturbance of lead paint during preparation of paint surfaces for repainting, paint removal, or remodeling.²

Take-home lead from occupations and hobbies

Adults employed in occupations such as construction, lead recycling or lead smelting, as well as those with hobbies such as refinishing antiques, making lead sinkers or casting ammunition from lead shots, can be exposed to lead. Parents or caretakers whose occupations or hobbies expose them to lead have the potential to transfer hazardous lead dust from their place of work or recreation to the car, home, or yard where it becomes accessible to young children or women of childbearing age. This type of exposure is called “take-home” exposure. Take-home lead can have adverse effects on the health of children and adults. Examples of high-risk occupations include construction and demolition workers, battery and metal recycling, firing-range instructors, foundry workers, lead miners and smelters, pipe fitters, pottery workers, stained glass makers, and welders. Examples of high-risk hobbies include shooting in indoor ranges, casting bullets or lead sinkers, home renovations, pottery making, refinishing furniture, and car and boat repairs.

Consumer products

In Florida, consumer products containing unsafe levels of lead are a small yet concerning source of lead exposure for children. Products in Florida that may contain unsafe levels of lead include jewelry, toys, vinyl mini-blinds, lead-glazed pottery, fishing lures and sinkers, tile, and ammunition. For information on previously recalled products with unsafe levels of lead, please refer to the following Consumer Product Safety Commission website at www.cpsc.gov/Recalls.

Home or folk remedies and cultural practices

Some common home or folk remedies or cultural practices involve lead. These practices include giving children azarcon or greta for health ailments, using kohl or surma for face and body painting or decoration, and eating imported candies. A list of items that are known to contain lead are listed at www.cdc.gov/nceh/lead/prevention/sources/foods-cosmetics-medicines.htm. Less commonly, secondary sources such as water contaminated by its flow through lead pipes or brass fixtures, soil contaminated by lead dust, and certain consumer products that contain lead can be significant contributory sources.

At-risk populations

Children from all socioeconomic statuses can be affected by lead poisoning. Children <6 years old are at highest risk because they tend to put their hands or other objects into their mouth, they absorb a greater percentage of lead, and their developing bodies are more vulnerable to the effects of lead. Differences in the rate of lead poisoning have been identified by race, ethnicity, age, and insurance status, with significantly higher BLLs in

younger children, especially those belonging to poor families and those enrolled in Medicaid. For children ≥ 6 years old, screening is only recommended for those who are foreign-born or otherwise identified as high-risk. Since less screening is done, fewer cases are identified in older children. Children ≥ 6 years old with elevated BLLs require the same components of follow-up services as younger children, including follow-up blood lead testing, risk reduction education, nutritional counseling, developmental screening, environmental management, and medical treatment, depending on BLLs. Mean BLLs were significantly higher in non-Hispanic Blacks compared to non-Hispanic whites and Mexican American children.³ Children who recently immigrated and children in households below the federal poverty level are more likely to have elevated BLLs, independent of housing age. High-risk populations include those residing in older homes (built before 1978) or in areas with a large proportion of older homes and those residing in ZIP codes with a high prevalence of lead poisoning.

Treatment

Primary care providers should consider oral chelation therapy treatment (e.g., succimer) for cases with a venous BLL ≥ 45 $\mu\text{g}/\text{dL}$. For additional information on chelation, please refer the provider to the Florida Poison Information Center Network. Other references are the Centers for Disease Control and Prevention's (CDC's) Managing Elevated Blood Lead Levels Among Children (www.cdc.gov/nceh/lead/casemanagement/managingEBLLs.pdf) or FDOH's Childhood Lead Poisoning Screening and Case Management Guide (FloridaHealth.gov/environmental-health/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf).

Lead poisoning in Florida children

Lead poisoning has been reportable since 1992. In 2017, Florida lowered the BLL for lead poisoning from ≥ 10 to ≥ 5 $\mu\text{g}/\text{dL}$ to align with current national guidelines based on the adverse health effects caused by BLLs < 10 $\mu\text{g}/\text{dL}$ in both children and adults. Since expanding the case definition, a total of 1,155 cases of lead poisoning were reported in 2019. The large increase in cases each year is driven by cases with BLLs ≥ 5 and < 10 $\mu\text{g}/\text{dL}$, which accounted for 63% of 2019 cases. The most common sources of lead exposure for children include paint dust, flakes, or chips in houses built prior to elimination of lead in paints in 1978. Because few cases with BLLs ≥ 5 and < 10 $\mu\text{g}/\text{dL}$ are investigated, most of the cases (~83% in 2019) have an unknown source of exposure. Higher incidence is seen in children aged < 6 years in comparison to older children. Lead poisoning cases are easily identified in children < 6 years as they are screened more often than older children. Lead screening is required for children < 6 years old who are Medicaid-enrolled or -eligible and recommended for children who are foreign-born or otherwise identified as high-risk. Children in this age group are more likely to put lead-contaminated hands, toys, or paint chips in their mouths making them more vulnerable to lead than older children.

C. Case definition

Background

Lead poisoning is often asymptomatic, but may result in impaired neurobehavioral development, low IQ, slow nerve conduction, peripheral neuropathies, and encephalopathy.

Clinical criteria for case classification

Not applicable.

Laboratory criteria for diagnosis

Confirmatory:

Either of the following:

- Blood lead level ≥ 5 $\mu\text{g}/\text{dL}$ measured from a venous specimen
- **Or** blood lead level ≥ 5 $\mu\text{g}/\text{dL}$ measured from **two** capillary specimens, unknown specimens (i.e., venous or capillary), or a combination of capillary and unknown specimens taken **within 12 weeks** of one another.

Supportive:

Blood lead level ≥ 5 $\mu\text{g}/\text{dL}$ measured from a single capillary specimen or unknown specimen (i.e., venous or capillary).

Epidemiologic criteria for case classification

Not applicable.

Case classification

Confirmed:

A person with confirmatory laboratory evidence.

Suspect:

A person with supportive laboratory evidence.

Criteria to distinguish a new case from a previous report

Only one case should be created for any person tested, regardless of the number of results received or the blood lead level. All additional results received for that person will be associated with that case.

Comment

All blood level lead tests are reportable in Florida. **Note that cases with blood lead levels ≥ 5 and < 10 $\mu\text{g}/\text{dL}$ will be automatically created and reported as lead poisoning cases in Merlin. No follow-up is required on these cases, and no extended data will be required.** Screening results < 5 $\mu\text{g}/\text{dL}$ will be maintained in Merlin and a case will be created with a dx status of “not a case” for each person.

The Childhood Lead Poisoning Screening and Case Management Guide is a resource available for CHD disease investigators and health care providers. It contains additional information on disease investigation, lead poisoning testing, case management, and requirements for environmental investigations. The guide is available at [FloridaHealth.gov/healthy-environments/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf](https://www.floridahealth.gov/healthy-environments/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf).

D. Laboratory testing

Venous and capillary blood lead tests are the only lead screening method recommended by the Florida Department of Health. Venous testing is the preferred method for measuring BLL for accuracy and may be a sign of recent exposure to lead. While capillary finger-prick specimens are appropriate for screening tests, all BLLs ≥ 5 $\mu\text{g}/\text{dL}$ from capillary specimens should be confirmed with a venous blood lead test. Capillary blood lead tests frequently yield false positives.

Venous blood lead test

This is the preferred method for all blood lead testing and should be used for lead measurement whenever practical. Blood collected by venipuncture has a lower likelihood of contamination compared to blood collected by a capillary blood draw.

Capillary blood lead test using a capillary tube

Contamination of blood specimens obtained by the capillary blood testing method can be minimized if trained personnel follow proper technique outlined by the CDC. Children screened using this method with an elevated BLL require a confirmatory venous blood lead test.

Capillary blood lead test using an onsite blood lead analyzer (i.e., LeadCare® Analyzer)

Health care providers should follow the user guide carefully when collecting and analyzing blood using this method. Providers using this method must meet all Clinical Laboratory Improvement Amendments (CLIA) requirements. When using portable testing machines, reporting all BLL results becomes the provider’s

responsibility. If needed, contact Florida Department of Health's Lead Poisoning Prevention Program (LPPP) to discuss reporting requirements and the most efficient way to report BLL results.

Capillary blood lead test using filter paper

The use of filter paper is not recommended. Children screened using this method with an elevated BLL require a follow-up venous blood lead test.

Specimen Collection

Blood lead collection must be done properly to ensure an appropriate sample. Please refer to CDC guidance (www.cdc.gov/nceh/lead/lab/default.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fnceh%2Flead%2Ftraining%2Fblood_lead_samples.htm) on collecting and handling blood lead samples. Whenever possible, health care workers should use laboratories that can achieve routine quality control of +/-2 µg/dL for blood lead analysis (federal regulations allow laboratories that perform blood lead testing to operate with a total allowable error of +/-4 µg/dL).

Confirmatory testing

Children with a BLL ≥5 µg/dL from a capillary or unknown specimen should have follow-up confirmatory venous testing consistent with the schedule below. Investigation and follow-up are optional for BLLs ≥5 µg/dL and <10 µg/dL but are required when BLLs are >10 µg/dL. Call the provider to ensure a follow-up date for further testing is scheduled. The need for additional investigation and follow-up is based on confirmatory testing results. If there is reason to believe the BLL may be increasing rapidly, or if the child is younger than 1 year old, consider repeating the blood lead test sooner than indicated in the table below.

Table 1. Recommended timeframes for confirmatory venous testing

BLL (µg/dL)	Request a confirmatory venous blood lead test within
5–9.9	3–6 months
10–19.9	1–3 months
20–44.9	1 week–1 month
45–59.9	48 hours
60–69.9	24 hours
≥70	Immediately as an emergency lab test

Table 2. Action based on outcome of confirmatory testing

Outcome of confirmatory testing	Action
No follow-up testing performed	Investigation is complete.
<5 µg/dL	Investigation is complete.
≥5–<10 µg/dL	Investigation is optional.
≥10 µg/dL	Conduct investigation and follow-up until child has 2 BLLs <5 µg/dL at least 6 months apart (preferably venous).

Follow-up testing

Venipuncture is the preferred draw method for follow-up testing. Case managers should call the provider to ensure a follow-up date for further testing is scheduled. Following up with providers is optional for BLL <10 µg/dL.

Table 3. Recommended timeframes for follow-up blood lead testing

Venous BLL (µg/dL)	Follow-up testing (2-4 tests after identification)	Later follow-up testing after BLL declining
5–9.9	3 months	6–9 months
10.0–19.9	1–3 months	3–6 months
20.0–24.9	1–3 months	1–3 months
25.0–44.9	2 weeks–1 month	1 month
≥45	As soon as possible	Retest every 2 to 4 weeks (or more based on most recent BLLs)

Some case managers or health care providers may choose to repeat blood lead tests on all new patients within a month to ensure that their BLL is not rising more quickly than anticipated. Providers may choose to conduct a follow-up test sooner if the child is <1 year old.

E. Case Investigation and Follow-up

Basic BLL investigation

- **Additional investigation and follow-up are optional for cases with BLLs ≥5 and <10 µg/dL but should be conducted for cases with BLLs ≥10 µg/dL.**
- Interview the parent/guardian.
 - Assess environmental risk factors, previous lead exposure and treatment history if applicable, Medicaid status, symptoms, occupational status of household contacts, eating habits, behaviors, and housing situation and document collected information on the Merlin extended data screen.
 - If the child is >6 years old, determine the reason for lead testing (e.g., concern that the child had a possible exposure to lead, including any specific or suspected source(s) of potential exposure), and assess as above.
 - Provide education about sources of lead, exposure pathways, nutrition, and housekeeping.
 - Recommend that household contacts and siblings <6 years old be tested.
- Provide recommendations to the health care provider for all children. Priority should be given to children <6 years old.
 - Refer pregnant women with BLLs ≥5 µg/dL to their gynecologist.
 - Recommend that the provider refer the child to Women, Infants, and Children (WIC) ([FloridaHealth.gov/programs-and-services/wic/index.html](https://www.floridahealth.gov/programs-and-services/wic/index.html)) at 800-342-3556 or Children’s Medical Services (CMS) ([FloridaHealth.gov/programs-and-services/childrens-health/childrens-medical-services/index.html](https://www.floridahealth.gov/programs-and-services/childrens-health/childrens-medical-services/index.html)) at 866-799-5321, if needed.
 - Provide confirmatory and follow-up testing guidelines and ensure they are followed (see [confirmatory testing](#) section III.A and [follow-up testing](#) section III.B).
 - Refer to the FDOH Childhood Lead Poisoning Screening and Case Management Guide ([FloridaHealth.gov/environmental-health/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf](https://www.floridahealth.gov/environmental-health/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf)) for clinical guidance, if needed.
 - Consider developmental screenings and discuss long-term developmental follow-up with the parent/guardian.

Environmental health investigation

Conduct an environmental health investigation for children with a venous BLL ≥ 20 $\mu\text{g}/\text{dL}$ or two venous BLLs ≥ 15 $\mu\text{g}/\text{dL}$ taken more than three months apart.

- Environmental health investigations should be conducted by an EPA-certified lead risk assessor at the child's home and other sites where the child spends a significant amount of time. The case investigator should accompany the EPA-certified lead risk assessor and document findings on the Merlin extended data screen.
- For help locating a lead risk assessor or information on firms certified to provide lead remediation, visit http://cfpub.epa.gov/flpp/search.cfm?Applicant_Type=firm or contact the Bureau of Epidemiology at 850-245-4401.
- A history of the child's environmental exposures can identify possible sources of lead exposure. Measurements of environmental lead levels should include house dust, paint that is not intact or is subject to friction, exposed soil (especially play areas), and other potential lead exposure sites.
- The lead risk assessor will make recommendations for lead remediation and facilitate interventions to reduce ongoing exposures to lead, if needed.
- Refer cases for lead-related housing remediation services as appropriate. Remediation of lead in residential settings should be done in accordance with the EPA's Renovation, Repair, and Painting (RRP) Rule (www.epa.gov/lead/lead-renovation-repair-and-painting-program).
- If imported food products, spices, home remedies, contaminated water or contaminated soil are a suspected source of lead exposure, provide resources and recommendations for additional testing.

Investigation for venous BLL ≥ 20 $\mu\text{g}/\text{dL}$ or 2 venous BLLs ≥ 15 $\mu\text{g}/\text{dL}$ >3 months apart

- Conduct a basic BLL investigation.
- Coordinate an [environmental health investigation](#) (see section above). Document findings on the Merlin extended data screen.

Investigation for BLLs 45–69 $\mu\text{g}/\text{dL}$

- Conduct a basic BLL investigation.
- Advise health care provider to consult Florida Poison Control at 800-222-1222 about chelation therapy. If therapy is done, document treatment information on the Merlin extended data screen and upload medical records.
- Coordinate an environmental health investigation **within 48 hours of notification** (see [environmental health investigation](#) section above). Document findings on the Merlin extended data screen.

Investigation for BLLs ≥ 70 $\mu\text{g}/\text{dL}$

- Children with BLLs ≥ 70 $\mu\text{g}/\text{dL}$ constitute a medical emergency and must be hospitalized immediately. Upload medical records in Merlin.
- Advise health care provider to consult Florida Poison Control at 800-222-1222 about chelation therapy. If therapy is done, document treatment information on the Merlin extended data screen and upload medical records.
- Begin basic BLL investigation **within 24 hours of notification**, even on weekends.
- Coordinate an environmental health investigation **within 24 hours of notification**, even on weekends (see [environmental health investigation](#) section above). Document findings on the Merlin extended data screen.

Conclude investigation

An investigation is concluded when a child has 2 BLLs < 5 $\mu\text{g}/\text{dL}$ at least 6 months apart (preferably venous), a child moves to another state, or three attempts to contact a child's parent/guardian have failed. Please document the investigation outcome on the Merlin extended data screen.

F. Merlin data entry and reports

Merlin data entry

Merlin will automatically process ELR results and will associate the lab with an existing case or create a new case as appropriate. Cases with BLLs <10 µg/dL will be auto-reported.

For paper results, CHDs can complete data entry or fax to the State Health Office at 850-414-6894 for data entry. If the CHD completes data entry, ensure every result is entered as a lab in Merlin, regardless of BLL, and has an associated reported case. Associate **follow-up** BLLs (elevated and non-elevated results) to the case in Merlin. Only one case should be created for any person tested, regardless of the number of results received or BLLs.

The table below summarizes what Merlin will do and what CHD staff should do based on whether results came via paper or ELR and the BLL.

Table 4: Summary of Merlin and CHD actions for BLL results

BLL (µg/dL)	Merlin action	CHD action
For BLL results received by ELR or paper results faxed to the State Health Office data entry staff:		
<10 ug/dL	Merlin/data entry staff will: <ol style="list-style-type: none"> 1. Create the lab 2. Associate lab with a case if one exists or create new case 3. Assign/update dx status 4. Auto report the case 	CHD action: <p>Do nothing; cases will not appear on CHD task lists. Investigating cases with BLLs ≥5 µg/dL and <10 µg/dL is optional.</p>
≥10 ug/dL	Merlin/data entry staff will: <ol style="list-style-type: none"> 1. Create the lab 2. Associate lab with a case if one exists or create new case 3. Assign/update dx status 4. Add new cases to CHD case task list 	CHD action: <ol style="list-style-type: none"> 1. Complete investigation and ensure follow-up testing 2. Complete basic data and extended data screens in Merlin 3. Report the case
For paper BLL results entered by CHD:		
<10 ug/dL	Merlin will: <ol style="list-style-type: none"> 1. Assign/update dx status 	CHD action: <ol style="list-style-type: none"> 1. Enter lab result 2. Associate lab with a case if one exists or create new case 3. Report the case (investigating cases with BLLs ≥5 µg/dL and <10 µg/dL is optional)
≥10 ug/dL	Merlin staff will: <ol style="list-style-type: none"> 1. Assign/update dx status 	CHD action: <ol style="list-style-type: none"> 1. Enter lab result 2. Associate lab with a case if one exists or create new case 3. Complete investigation and ensure follow-up testing 4. Complete basic data and extended data screens in Merlin 5. Report the case

Report non-Florida cases in Merlin. Investigation is not necessary for non-Florida cases.

For questions, please contact the Merlin Helpdesk at Merlin.Helpdesk@flhealth.gov

Lead Priority Follow-Up Report

The Lead Priority Follow-Up Report is a list of lead poisoning cases in children <6 years old with a BLL of ≥ 10 $\mu\text{g}/\text{dL}$ and no case closure date entered in the case closure information section of the lead extended data section. To remove cases from this report, enter a case closure date on the extended data screen in Merlin. Follow the three instructions below to access the Lead Priority Follow-Up Report:

Step 1. To access the report, go to the Task tab in Merlin.

Step 2. In the Task List menu, select All Task Lists.

Step 3. In the Cases section, select the Lead Priority Follow-Up Report.

Criteria for the resulting line list can be updated by changing the common criteria. The “last blood level ($\mu\text{g}/\text{dL}$)” column shows the most recent test result which may be lower than previous results and may no longer be ≥ 10 $\mu\text{g}/\text{dL}$. These cases have previous results with a BLL of ≥ 10 $\mu\text{g}/\text{dL}$ and still need a closure date.

The Last Blood Level column shows the most recent test results, which may be lower than previous results and may not longer be ≥ 10 $\mu\text{g}/\text{dL}$. These cases have previous results ≥ 10 $\mu\text{g}/\text{dL}$ and still need a closure date.

To update search criteria like dx status or age, select Common Criteria in the Lead Priority tab.

Case #	FL Disease Code	Case Closure	County	DX Status	Last Name	Date of Birth	Last Blood Level ($\mu\text{g}/\text{dL}$)	Lab Event
		Open		Suspect			15.7	01/16/2019
		Open		Suspect			18.4	02/19/2019
		Open		Suspect			17.9	08/07/2019
		Open		Suspect			1	02/27/2019
2508642	94890 - Lead Poisoning	Open		Suspect			1	04/16/2019
2511309	94890 - Lead Poisoning	Open		Suspect			14	03/23/2019
2547081	94890 - Lead Poisoning	Open		Confirmed			18.2	08/13/2019
2619580	94890 - Lead Poisoning	Open		Suspect			10.8	07/02/2019

Merlin analysis tool

The Merlin analysis tool includes a report of lead poisoning cases with a blood lead level of ≥ 5 $\mu\text{g}/\text{dL}$ and < 10 $\mu\text{g}/\text{dL}$ reported since 2017. The Merlin analysis tool is an exe file kept in a shared network folder.

To access the Merlin analysis tool, go to the Merlin home screen and follow the steps below.

The image shows the Merlin website home screen on the left and a Windows File Explorer window on the right. The website has a navigation bar with 'Home', 'Search', 'Outbreak', 'Analysis', and 'Resource' tabs. Below the navigation bar is a search field and a 'Most Recent EpiCom Posts' section with a table of posts. A 'Message of the Day' section is also visible. The File Explorer window shows a network path: 'Network > dchp00vfp01 > CHDShare > DC...'. Inside this folder, there is a sub-folder named 'Merlin Analysis Tool' and a file named 'Merlin Analysis Tool Quick User Guide.docx'. Red callout boxes provide instructions: 'Step 1. Click the Merlin Analysis Tool link. A folder containing the tool and a user guide will open.' and 'Step 2. Copy the Merlin Analysis Tool file to a location accessible from the local computer.'

To open the tool, double click the file, then follow the steps below to generate an Excel line list of lead poisoning cases with a blood lead level of ≥ 5 $\mu\text{g}/\text{dL}$ and < 10 $\mu\text{g}/\text{dL}$ reported since 2017.

The image shows the Merlin Query Tool interface. At the top, there are tabs for 'Zika', 'Salmonellosis', 'Lead', 'Flu', 'EH', 'Hepatitis A', and 'FL Shots'. The 'Lead' tab is selected. Below the tabs, there is a dropdown menu for 'Lead cases: highest blood lead level ≥ 5 and < 10 $\mu\text{g}/\text{dL}$ (updated on 08/28/2018)'. To the right, there is an 'Additional Selection' section with a 'County:' dropdown menu and a 'Date From:' dropdown menu. At the bottom, there is an 'Action' section with a 'Generate Spreadsheet' button and an 'Exit' button. Red callout boxes provide instructions: 'Step 4. Select the Lead tab and select the Lead cases report.', 'Step 5. Select a County and click Generate Spreadsheet.', and 'Step 6. The tool will create an Excel file in a folder named LeadData on the user's desktop.'

Contact the Merlin helpdesk at Merlin.Helpdesk@flhealth.gov for assistance.

G. Prevention information for parents

Educate families of children with elevated BLLs on the potential adverse health effects of an elevated lead levels, the need for follow-up testing to monitor the child's BLL until it returns to an acceptable range, and recommendations on how to prevent further exposure to lead. Educational fact sheets and brochures can be found on FDOH's LPPP website ([FloridaHealth.gov/environmental-health/lead-poisoning/educational-materials.html](https://www.floridahealth.gov/environmental-health/lead-poisoning/educational-materials.html)) and the CDC's Childhood Lead Poisoning Prevention Program website (www.cdc.gov/nceh/lead/about/program.htm).

- Make sure children do not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Pregnant women and children, especially those <6 years old, should not live in or visit housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living and play areas and possible sources of lead exposure.
- Regularly wash children's hands and toys which can become contaminated from household dust or exterior soil, known sources of lead exposure.
- Because household dust is a major source of lead, parents should wet-mop floors and wet-wipe windows and horizontal surfaces every 2–3 weeks. Windowsills and wells can contain high levels of leaded dust and should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Prevent children from playing in bare soil. If possible, provide them with sandboxes. Parents should plant grass on areas of bare soil or cover the soil with mulch or wood chips, if possible. Until the bare soil is covered, parents should move play areas away from bare soil and away from the sides of the house.
- To further reduce a child's exposure from non-residential paint sources:
 - Avoid using traditional home remedies and cosmetics that may contain lead.
 - Avoid eating imported candies or foods containing chili or tamarind, especially from Mexico.
 - Avoid using containers, cookware, or tableware not shown to be lead-free to store or cook foods or liquids.
- Remove recalled toys and toy jewelry from children immediately. Check lead recall lists on the U.S Consumer Product Safety Commission website (www.cpsc.gov/Recalls).
- Shower and change clothes after finishing a task that involves working with lead-based products, such as stained-glass work, bullet making, or using a firing range.
- Visit FDOH's LPPP website ([FloridaHealth.gov/environmental-health/lead-poisoning/index.html](https://www.floridahealth.gov/environmental-health/lead-poisoning/index.html)) for additional educational information on lead poisoning.

H. Resources and references

Resources

FDOH Lead Poisoning Prevention Program—Information about lead exposure and prevention.

[FloridaHealth.gov/environmental-health/lead-poisoning/index.html](https://www.floridahealth.gov/environmental-health/lead-poisoning/index.html)

Childhood Lead Poisoning Screening and Case Management Guide—Information about testing for elevated blood lead, blood lead reporting requirements, clinical guidance, and lead poisoning treatment.

[FloridaHealth.gov/environmental-health/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf](https://www.floridahealth.gov/environmental-health/lead-poisoning/_documents/childhood-leadpoisoning-screening-casemanagement-guide.pdf)

Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention—Information on recommendations regarding case management guidelines for the evaluation and treatment of children with BLLs $\geq 10\mu\text{g/dL}$ and those requiring chelation (BLLs $\geq 45\mu\text{g/dL}$). www.cdc.gov/nceh/lead/casemanagement/managingEBLLs.pdf

Laboratory Considerations—Information on reducing the risk of contamination during blood collection for lead testing. www.cdc.gov/nceh/lead/training/blood_lead_samples.htm

FDOH Educational Materials—Fact sheets and brochures on nutrition, general housekeeping, and lead poisoning prevention. [FloridaHealth.gov/environmental-health/lead-poisoning/educational-materials.html](https://www.floridahealth.gov/environmental-health/lead-poisoning/educational-materials.html)

FDOH Women, Infants, and Children (WIC)—Information on how to contact the program to get enrolled and information on educational materials on nutrition, food vendors, healthcare providers, and breastfeeding support. [FloridaHealth.gov/programs-and-services/wic/index.html](https://www.floridahealth.gov/programs-and-services/wic/index.html)

Children's Medical Services Health Plan (CMS)—Information on types of services for children and their families such as doctor's visits, laboratories, and emergency care. www.wellcare.com/en/Florida/Members/Medicaid-Plans/CMS

U.S. Consumer Product Safety Commission—Information about risks of injury or death associated with the use of the different types of consumer products that have been recalled for lead contamination. www.cpsc.gov/Recalls

CDC Childhood Lead Poisoning Prevention—Information on lead poisoning prevention, health effects, sources of lead, at-risk populations for lead exposure, nationwide lead poisoning data, and links to other state lead poisoning prevention programs. www.cdc.gov/nceh/lead/prevention/default.htm

CDC Lead in Foods, Cosmetics, and Medicines—Information on how a child can be exposed to lead found in certain foods, cosmetics, and traditional medicines imported from other countries. www.cdc.gov/nceh/lead/prevention/sources/foods-cosmetics-medicines.htm

EPA—General information on lead exposure and information for lead abatement contractors and consultants about firm certification, individual licensure, notification, and training. www.epa.gov/lead/

Locate Certified Inspection, Risk Assessment, and Abatement Firms—Information on how to locate EPA certified risk assessors and certified abatement firms throughout the state.

<https://cfpub.epa.gov/flpp/pub/index.cfm?do=main.firmSearchAbatement>

EPA Renovation, Repair, and Painting (RRP) Rule—Information on EPA developed work practice standards for renovation contractors and construction firms. www.epa.gov/lead/renovation-repair-and-painting-program

References

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3. CDC. Interpreting and managing blood lead levels <10 µg/dL in children and reducing childhood exposures to lead: Recommendations of CDC's Advisory Committee on Childhood Lead Poisoning Prevention. *MMWR*. November 2, 2007; 56(RR08):1-14;16. Erratum: Vol. 56, No. RR-8 *MMWR*. November 30, 2007; 56(47):1241-1242. www.cdc.gov/mmwr/preview/mmwrhtml/rr5608a1.htm