2/3 homes in Ohio may have lead paint.

3 in 100 Ohio children have an elevated blood lead level.

LEAD PREVENTION
Resource Guide
Pre-1978 Housing

- Houses built before 1978 are likely to contain lead-based paint.
- Ohio’s large burden of elevated blood lead levels can be attributed to the age of Ohio’s housing stock as well as the lack of maintenance and deterioration of some homes. The systemic disinvestment in certain neighborhoods, disproportionately affecting minority communities, has resulted in high lead exposure risk in those communities.

Sources of Lead Exposure

Ways children can be exposed to lead:

- Lead-based paint dust/chips
- Occupational take-home lead
- Water
- Food/herbs
- Soil
- Toys
- Cosmetics*
- Spices*
- Folk remedies*

* Kids born abroad, especially recent refugees, are a potential high-risk population, as cosmetics, spices, and folks remedies from abroad are a less common, but not rare source of exposure.

There is no safe level of lead in the blood.

Ohio has the third highest percentage of children under age 6 with elevated blood lead levels.

95% of Ohio’s lead poisoning cases result from dust created by deteriorated lead-based paint in houses built before 1978.
Ensuring lead-safe environments and preventing any exposure to lead in children should be our most important goal. Physicians can play a significant role in this by educating parents and communities about the dangers of lead. When exposure is identified, there are important steps that must be taken to reduce exposure, absorption and hazards.

**Lead Poisoning Prevention**

### Reduce Exposure

**Cleaning**
- Common places with lead dust include wood floors, carpet, upholstery, window sills and window wells
- Wet mop instead of dry sweeping
- Borrow a HEPA vacuum from your local health department
- Thoroughly clean toys and other items that are used by children

**Hygiene**
- Wash hands often, especially before meals and before bedtime
- Do not let children play in bare soil outside

**Occupational**
If you work around products or materials containing lead (i.e. manufacturing, automotive or construction) avoid exposing your child to lead by:
- Changing clothes and shoes at work
- Showering as soon as you get home
- Washing work clothes separately

### Reduce Absorption

- A well-rounded healthy diet reduces lead absorption
- Vitamin C aids in iron absorption

**Foods rich in Iron and Calcium:**
- Non-heme iron: Dried beans, peas, lentils, spinach and broccoli
- Heme iron: Lean red meats, chicken and fish
- Calcium: Low-fat milk, cheese and yogurt

**Foods rich in Vitamin C:**
- Citrus, leafy greens, broccoli, bell peppers and sweet potatoes

### Reduce Hazards

- **Beware of lead dust:** Remodeling and renovating can create lead dust
- **Create safe barrier around lead hazards:** Use furniture as a barrier to windows that contain lead paint
- **Keep child safe:** Remove child from area and contain dust during remodeling
Most commonly, exposure is acutely asymptomatic, but long-term effects are observed at low and acutely asymptomatic levels. This is why we need to test high-risk kids.

**Signs and symptoms:**

- Irritability
- Behavioral problems
- Abdominal pain
- Lethargy
- Loss of appetite
- Headaches
- Memory loss
- Seizures (high lead exposure)

**Lifelong consequences:**

- Speech and language problems
- Decreased bone and muscle growth
- Hearing loss
- Damage to the nervous system and/or kidneys

**Effects of lead poisoning:**

- Developmental delay
- Cognitive problems
- Decreased IQ
  - Attention Deficit Disorder
- Violent crime

**Healthcare Provider Responsibilities**

Blood lead testing requirements for Ohio children less than 6 years:

1. **Medicaid eligible**
2. **Lives in a high risk zip code** (see Ohio High Risk Zip Codes Requiring Blood Lead Testing)
3. Lives in or regularly visits a home or building built before 1950
4. Lives in or regularly visits a home or building built before 1978 that has deteriorated paint
5. Lives in or regularly visits a home or building built before 1978 that has current or planned renovation/remodeling
6. Has a sibling or playmate that has or did have an elevated blood lead level
7. Frequently encounters an adult who has a lead-related hobby, or occupation
8. Lives near an active lead smelter, battery recycling plant, or other industry known to generate airborne lead dust
**MEDICAL MANAGEMENT**

- All capillary (finger/heel stick) test results ≥5 ug/dL must be confirmed by venous draw
- Point-of-care instruments such as the Lead-Care® II cannot be used to confirm an elevated blood lead level
- Any confirmed level of lead in the blood is a reliable indicator that the child has been exposed to lead
- The Ohio Healthy Homes and Lead Poisoning Prevention Program will respond accordingly to all blood lead levels of 5 ug/dL or greater
- According to the American Academy of Pediatrics Bright Futures, physicians should follow the Medical Management Recommendations provided by ODH.
- A minimum of two tests are recommended for all at-risk children prior to their third birthday; specifically, at the child’s one and two year well child visits. Some health departments recommend or require yearly testing until age 6.
- Healthcare providers must screen for asymptomatic lead poisoning and provide guidance on primary prevention.

**Aiding Families**

- Perform an environmental and family occupational history to educate parents about common sources of childhood lead exposure.
- Encourage parents to identify potential lead hazards in their homes and recommend ways to reduce their child’s lead exposure.
- Provide parents with free educational pamphlets and booklets developed by ODH.

**Medical Management Recommendations for Ohio Children receiving Blood Lead Test**

<table>
<thead>
<tr>
<th>Blood Lead Level (BLL)</th>
<th>Confirm Using Venous Blood Within</th>
<th>Medical Management Recommendations for BLL</th>
<th>Venous Retest Intervals After Recommended Actions</th>
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</table>
| <5 ug/dL               | Not required                      | • Explain that there is no safe level of lead in the blood, what the child’s BLL means, and how the family can reduce exposure. For reference, the geometric mean blood lead level for children 1 – 5 year is 1.3 up/dL.  
• Monitor the child’s neurological, psychosocial, and language development. | • Test again at age 2 if first test is at age 1  
• Lead testing should be considered if the child moves to a different home, daycare, school, etc. that was built before 1978. |
| 5 – 9 ug/dL            | 1 – 3 months                     | **In addition to medical management actions listed above:**  
• Provide lead education: potential environmental sources, effect of diet on exposure, potential health effects, and hazards associated with renovating pre-1978 homes.  
• Monitor subsequent increases/decreases in blood lead levels until the BLL remains <5 ug/dL for at least six months and lead exposures are controlled.  
• Complete child history and physical exam.  
• Assess iron status. Also consider status of hemoglobin or hematocrit. Children with low iron levels are more likely to have high blood lead levels. Follow AAP guidelines for prevention for iron deficiency.  
• Obtain an abdominal X-ray if particulate lead ingestion is suspected. Bowel decontamination should be performed if particulate lead ingestion is indicated.  
• Refer to the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) for other nutritional counseling.  
• Refer to Help Me Grow program within 7 days if a potential delay in development has been identified.  
• Refer to the Children with Medical Handicaps program (CMH). | • Every 3 months for first 2 – 4 tests  
• After 4 test, every 6 – 9 months until BLLs drop to below 5 ug/dL |
| 10 – 44 ug/dL          | Within 1 month                   | **In addition to medical management actions listed above:**  
• Confirm results by venous blood sample immediately. A venous specimen will ensure therapy is based on current and reliable information.  
• Lab work for hemoglobin or hematocrit and free erythrocyte protoporphyrin are indicated.  
• Immediately remove child from exposure source (chelation could have negative effects if not moved to lead safe environment).  
• Hospitalization and chelation therapy should be considered with consultation from a medical toxicologist or pediatric environmental health specialist. | Within 1 month  
• As soon as possible  
• Consult with expert |
| ≥45 ug/dL             | As soon as possible              | **In addition to medical management actions listed above:**  
• Confirm results by venous blood sample immediately. A venous specimen will ensure therapy is based on current and reliable information.  
• Lab work for hemoglobin or hematocrit and free erythrocyte protoporphyrin are indicated.  
• Immediately remove child from exposure source (chelation could have negative effects if not moved to lead safe environment).  
• Hospitalization and chelation therapy should be considered with consultation from a medical toxicologist or pediatric environmental health specialist. | As soon as possible  
• Consult with expert |
ODH Lead Poisoning Prevention Surveillance System
• State law requires clinical laboratories to be approved by ODH.
• All clinical laboratories are required to report blood lead levels to ODH.
• Cases and investigations are open for health department staff.

Case Management
• Case management services are provided by local health departments to coordinate the care of children with elevated blood lead levels.
• Case managers work collaboratively with primary care providers and public health lead investigators to ensure that proper medical management and follow-up occurs.
• Case managers provide education to families about the effects of lead and how to reduce their child’s lead level.

Public Health Lead Investigation
• A public health lead investigation occurs when a child’s blood lead level is confirmed at 5 – 9 ug/dL.
• A public health lead investigation with an environmental risk assessment occurs when a child’s blood lead level is confirmed at 10 ug/dL or higher.
• An investigator will attempt to identify lead hazards in a child’s environment and provide guidance on avoiding those hazards.

Additional Practices
• All children with BLL =>5 mcg/dL should be connected with Help Me Grow, as this automatically establishes eligibility for Early Intervention services.
• Obtain family permission to facilitate communication between the early intervention program, school and the medical home.
Contact:
Ohio Healthy Homes and Lead Poisoning Prevention Program
Ohio Department of Health
246 North High Street
Columbus, Ohio 43215
Phone: 1-877-LEADSAFE (1-877-532-3723)

Additional Resources for Information on Childhood Lead Poisoning:

**Government Agencies**
- Ohio Department of Medicaid: http://www.medicaid.ohio.gov/ FOROHIOANS/Programs/Lead.aspx
- U.S. Environmental Protection Agency (EPA): https://www.epa.gov/lead
- Centers for Disease Control and Prevention (CDC): https://www.cdc.gov/nceh/lead/

**Lead Advocacy and Support Groups:**
- National Center for Healthy Housing: http://centerforhealthyhousing.org/
- Children’s Environmental Health: Network  http://cehn.org
- Ohio Healthy Homes Network: http://www.ohhhn.org/
- Pediatric Environmental Health Specialty Units: www.pehsu.net
- Ohio Chapter, American Academy of Pediatrics: www.ohioaap.org
Timmy is a 12-month-old male in for a well child visit

• He lives in an apartment with his mom and 2 siblings
• Mom does not know the age of the building
• He visits with his dad who works in construction and lives in an “older” building with his mother
• Mom is going to school
• He attends childcare at a licensed daycare center
• He is insured by Medicaid

Does Timmy need a blood lead level?

YES – According to Ohio Law, Timmy needs a lead level

• He is insured by Medicaid
• His father’s occupation and housing are also possible sources of lead

Timmy’s lead level comes back at 7.5 mcg/dL
The local health department contacts Timmy’s mom and provides her with information on preventing lead exposure

• Wet cleaning of surfaces
• Encourage iron-rich foods
• Discourage oral behaviors
• Get a follow-up lead level in about 3 months

At 15 months, Timmy comes back

• Mom has been cleaning the home 2x/week
• Dad has been changing his clothes before playing with Timmy
• Lead level, CBC, Ferritin, CRP [From Aparna: or reticulocyte Hgb] (per AAP guidelines)
  • Lead 12 mcg/dL
  • CBC Hgb 10.8, otherwise normal
  • Ferritin 5.0
  • CRP normal

The Ohio Dept of Health performs a lead risk assessment at the home

• Timmy’s mom’s home was built in 1919
• There are lead hazards on the windows and trim as well as high lead dust levels on the floor
• There is water damage from a previous roof leak that is causing the plaster to bubble and crack
• There is bare soil in the back yard at the home where he plays
• Timmy drinks about 48 oz of cow’s milk/day
• Dad’s home was built in 1967, was completely renovated in the 1990s and dad only works in new construction

What other actions to take?

Iron supplementation

• Ferritin of 5 -> likely to increase lead absorption, low iron is also associated with developmental delays (see Baker et al, Pediatrics, 2010)

Reinforce temporary measures to address lead hazards

• Covering over areas of deteriorating paint with tape, etc
• Avoiding contaminated soil in the backyard
• Repeat lead level needed in about 1 month
Dear ____________________

Your child's lead level is ___ mcg/dL. Please come back on INSERT DATE to have his/her level rechecked.

_____ We prescribed a multivitamin with iron today.

_____ We did not prescribe a multivitamin with iron today because _______________________________________

Please also encourage your child to have 2-3 servings of calcium-rich foods (such as milk, cheese, yogurt, calcium – fortified cereal and plant-based milks).

Lead exposure can affect a child’s development, behavior, and learning. In order to help ensure your child’s healthy development, it is important to read, talk, and sing with your child, and to plan for your child’s enrollment in a high-quality preschool.

Early Intervention
Any child under age 3 with a blood lead level greater than 5 mcg/dL is eligible for Early Intervention services, which can help to support healthy development. Your doctor can send a referral letter, or you can also call Help Me Grow at 1-800-755-4769 throughout Ohio. If your child is age 3 or older and you have concerns about your child's behavior, attention, or learning, send a written request to your local school district for an evaluation to qualify for special education services. We can help you with this, if needed.

Sources of Lead
Preventing future lead exposure is the most important way to protect your child. Peeling or chipping lead-based paint and its resulting dust are the most common causes of elevated blood lead levels, for example, peeling paint on the porch and small paint chips from opening and closing windows. These issues should be addressed with maintenance and re-painting if needed. This should be done in a “lead-safe” manner (because if you begin scraping or disrupting paint there is a risk that lead paint exposure can get worse during renovation, if lead-safe methods aren’t used). Visit www.epa.gov/lead for information about lead safe renovations.

In-Home Lead Exposure Prevention
It is very helpful to take your shoes off when entering your home. This will help prevent lead exposure from soil. Also, frequent wet-mopping and vacuuming is helpful to get rid of lead dust. When running tap water for drinking, cooking, or mixing formula, make sure you run the water cold. Run the water until it is cold before filling a bottle or cup, especially if running the tap for the first time that day.

Ask your doctor about other less common sources of lead exposure.

Investigations
If your child has a lead level of 10 mcg/dL or higher, the health department will come to your home to look for lead hazards. They can assist you in identifying the cause of lead exposure for your child. The health department should call you to arrange this visit.

Financial Assistance
There are some Medicaid funds to help people test their homes for lead, fix the lead hazards, get cleaning supplies to manage lead, or get help with temporary housing. There must be someone in the home who 1) lives there or visits more than 6 hours a week, 2) is Medicaid eligible and 3) is under 19 years old or pregnant. To learn more, call the Ohio Department of Health at 877-532-3723. Have the name of the Medicaid eligible person, their date of birth and their Medicaid number available when you call.

Legal Rights
You may have claims against a landlord or former owner, if your child has been lead poisoned. Consider working with a personal injury attorney. Ohio Legal Help may be able to help you identify legal counsel in your area at www.ohiolegalhelp.org.

Tenants
If you rent a pre-1978 home, ask your landlord to fix any peeling or chipping paint or other lead hazards. Make sure you request in writing and give it to your landlord in the way you pay rent. Keep a copy of the letter. Continue to pay your rent. If your landlord does not respond within 30 days and you are current in your rent, you can deposit your full rent at your municipal court, request an order from the court to force repairs, or break your lease.

Finding Lead Safe Homes
You can check whether a house or apartment has any identified lead hazards by address by typing housing.health (only for Cleveland area) into any internet browser. However, just because a unit does not have a lead hazard order, does not mean it is lead safe.

Please let your doctor know if you have questions. We are here to help and partner with you to ensure your child is protected from the consequences of lead exposure.
THE IMPORTANCE OF PREVENTION

• There is no safe blood lead level.
• There is no evidence that the effect of lead exposure can be reversed.
• Lead exposure is a risk factor for impaired development and school performance and behavioral problems through a person’s entire life.
• EBLL is not something that can be diagnosed and reversed – primary prevention is key.

All kids living in high risk zip codes and all kids insured through Medicaid should have a venous or capillary test completed at 12 and 24 months, per Ohio Department of Health recommendations and Ohio State Law

• While capillary testing is acceptable for screening purposes, medical and environmental testing should be planned based on venous confirmatory test following positive capillary test.
• Venous confirmatory testing should be performed on all children with a capillary blood lead level of 5 mcg/dL or higher and all future lead levels for that child should be venous lead levels.
• High-risk kids who did not have a blood level test at age 1 or 2 should have a capillary or venous test done. Recheck lead level at 3-12 months, depending on the child’s age.

PATIENT FOLLOW UP

• Steps if lead if lead is detected (BLL < 5 mcg/dL):
  - Geometric mean BLL for children <6 is approximately 1 mcg/dL
  - Reinforce primary prevention strategies
  - Re-check lead level

• EBLL (BLL >= 5 mcg/dL) diagnosed through capillary testing should be confirmed with venous test
• Schedule a follow-up test
• For additional medical management needs, possible referral to regional children’s hospital
• Early Intervention referral for children with BLL 5ug/dL or higher

Resource: Pediatric Environmental Health Specialty Units https://www.pehsu.net