Williams County Health Department

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Williams County Health District

Williams County

Lead Report 2018-2022

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Purpose:

The Williams County Health Department recognizes the harmful effects of lead, especially to children, and is working toward the goal of eliminating childhood lead poisoning by reducing the number of children who are exposed to lead. The purpose of this report is to create awareness of the issue and to promote options to prevent lead poisoning in Williams County.

What is lead?

Lead is a naturally occurring element found in small amounts in the earth's crust (EPA, 2023). It is a soft, dense, bluish-grey metal that tarnishes easily in air to a dark grey color. The element is very stable, moldable, resistant to corrosion, a poor conductor of electricity, and an effective shield against radiation (ATSDR, 2023). While it has some beneficial uses, lead can be toxic to humans and animals and result in poor health outcomes.

History of using lead:

Why lead was used in water pipes: The use of lead in water pipes goes back thousands of years. Lead was chosen by ancient civilizations for piping because of its ability to resist pinhole leaks while being soft enough to form into shapes that deliver water efficiently. Many municipal water systems and the homes and other buildings they serve have been around for a long time, long before the dangers of lead were identified. (PMI, 2023). In the U.S, lead pipes were used until 1986 when Congress enacted the Safe Drinking Water Act, which banned lead pipes (EPA, 2023).

Why lead was used in paint: Lead paint was produced as early as the 4th century BC. Certain lead compounds were added to paint to create bright, vivid colors like white, yellow, and red. Lead also makes paint resistant to moisture, helping to accelerate drying times and create a long-lasting finish. (Cleveland Clinic, 2022).

In 1971, the U.S. Congress banned the use of lead-based paints in any newly built residential or commercial buildings, but only if they were constructed using federal funding or assistance. Seven years later, in 1977, the U.S. Consumer Product Safety Commission finally banned the use of lead-based paint completely in residential and public properties. Also in 1977, the use of lead paint in toys and furniture was banned in the United States. In 1996, the Lead-Based Paint Disclosure Regulation, put in place by the U.S. Environmental Protection Agency (EPA) and the Department of

Housing and Urban Development, requires owners of homes built in 1978 or earlier to disclose the presence of lead paint to potential buyers or renters (Zota Pro, 2023).

Where can lead be found?

People are exposed to lead by eating lead paint chips, ingesting contaminated food or water, and/or by breathing in lead dust. Many children ingest lead dust by putting objects such as toys and dirt in their mouths. According to the CDC, sources of lead exposure can include the following:

1. **Water** from lead pipes
2. **Soil** near airports, highways, factories, or homes that used lead paint
3. Chipping or peeling **paint** in homes or **buildings built before 1978**

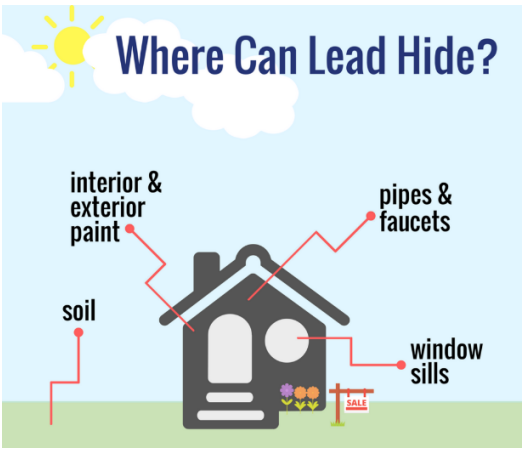
Figure 1

In Williams County, 67.6% of all houses were built **before 1980** and 32.4% were built **after 1980**.

Figure 2

In Williams County, 77.4% of people who lived in houses built before 1980 **owned** their home and 22.6% **rented**.

4. Some **imported candies** and **traditional medicines**
5. Some **imported toys** and **jewelry**



Where an individual works can also expose someone to lead, such as:

Demolition, abatement and cleanup of residential and commercial buildings, steel structures, or environmental sites

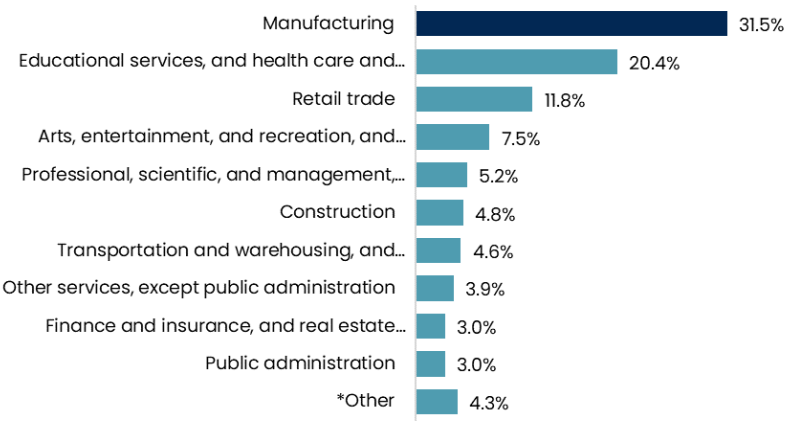
Manufacturing of products containing or coated with lead (e.g., metal equipment parts, batteries, bullets, circuits). **Figure 3** shows that manufacturing was the leading industry for employment in Williams County.

Painting, **sanding, or welding** on industrial equipment and steel structures (e.g., bridges and water towers)

Repair, renovation, remodeling, and/or **painting** of residential and commercial buildings

Use of firearms or working at a firing range (e.g., **law enforcement**, **military**, **private industry**, and **training**)

Figure 3 **Manufacturing** was the leading industry for employment for civilians age 16 and over in Williams County



(Source: CDC, 2023)

Importance of early testing for lead in children:

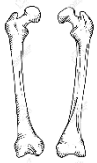
Most children with any lead in their blood have no obvious immediate symptoms. If a child may have been exposed to lead, parents should talk to their child's health care provider about getting a blood lead test. (CDC, 2023). Healthcare providers can administer blood lead tests to children at age 1 and 2, or up to age 6 if no previous test has been completed based on the following criteria: the child is on Medicaid, lives in a high-risk ZIP code, or has certain other risk factors (ODH, 2023). Testing early for lead can prevent future long-term permanent health effects in a child.

High-risk zip codes in Williams County include: 43502 43506 43517 43518 43521 43557 43570. Other high-risk factors include homes or buildings built before 1950, homes and buildings built before 1978 that have deteriorated paint or recent renovations, a sibling or playmate with lead poisoning, contact with an adult who has a hobby or works with lead, or living near certain industries. A screening questionnaire titled Blood Lead Testing Requirements can be found here.

Signs & Symptoms of lead poisoning:

No safe blood lead level (BLL) in children has been identified; even low levels of lead in blood are associated with developmental delays, difficulty learning, and behavioral issues. The CDC uses a blood lead reference value (BLRV) of 3.5 micrograms per deciliter (µg/dL) to identify children with BLLs higher than most children's levels. The Ohio Department of Health classifies blood lead levels >5 µg/dL to be considered elevated in children ages six and under (ODH, 2023). The effects of lead poisoning can be permanent and disabling. Exposure to lead can seriously harm a child's health and cause well-documented adverse effects in a child's health. Lead poisoning can have both short-term and permanent long-term effects on children.

The table below shows the short and long-term health problems of lead poisoning for children:

Short-term	Long-term
  • Lightheadedness • Fatigue • Dizziness • Shortness of breath • Abdominal pain • Cramping • Constipation • Muscle/joint pain • Irritability • Difficulties sleeping	   • Learning and behavioral problems • Lowered IQ • ADHD • Hearing and speech problems • High blood pressure • Damaged nerves • Anemia • Kidney failure • Slowed growth and development

(Sources: CDC and EPA, 2023)

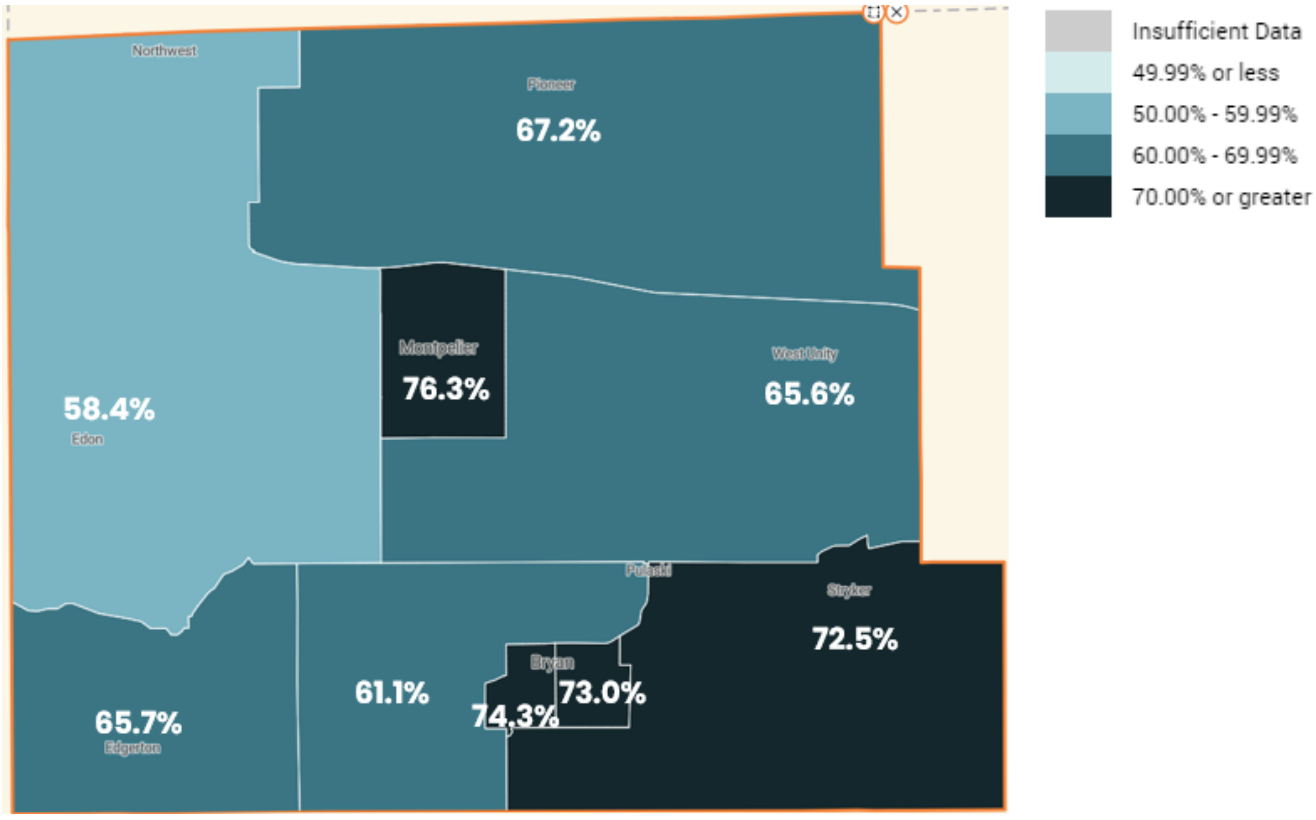
Lead is also harmful to **pregnant women** and **fetuses**. During pregnancy, lead is released from the mother's bones along with calcium and can pass from the mother exposing the fetus or the breastfeeding infant to lead (EPA, 2023). This can result in serious effects to the developing fetus and infant, which may:

- Cause the baby to be born **too early** or **too small**
- Hurt the baby's **brain, kidneys**, and **nervous system**
- Increase the likelihood of **learning or behavioral problems**
- Put the mother at risk for **miscarriage**

Who is at risk for lead exposure?

Children from **low-income households** and those who live in **housing built before 1978** are at the greatest risk of lead exposure (CDC, 2023). **Children younger than six years** are more likely to be exposed due to their hand-to-mouth behavior. Children six years old and younger are most susceptible to the effects of lead. Lead is particularly dangerous to children because their growing bodies absorb more lead than adults do, and their brains and nervous systems are more sensitive to the damaging effects of lead. Living in a home built before 1978 is one of the biggest risk factors for children being exposed to lead. **Figure 4** shows the estimated percentage of all housing units built in 1979 or before, as of 2017-2021 in Williams County.

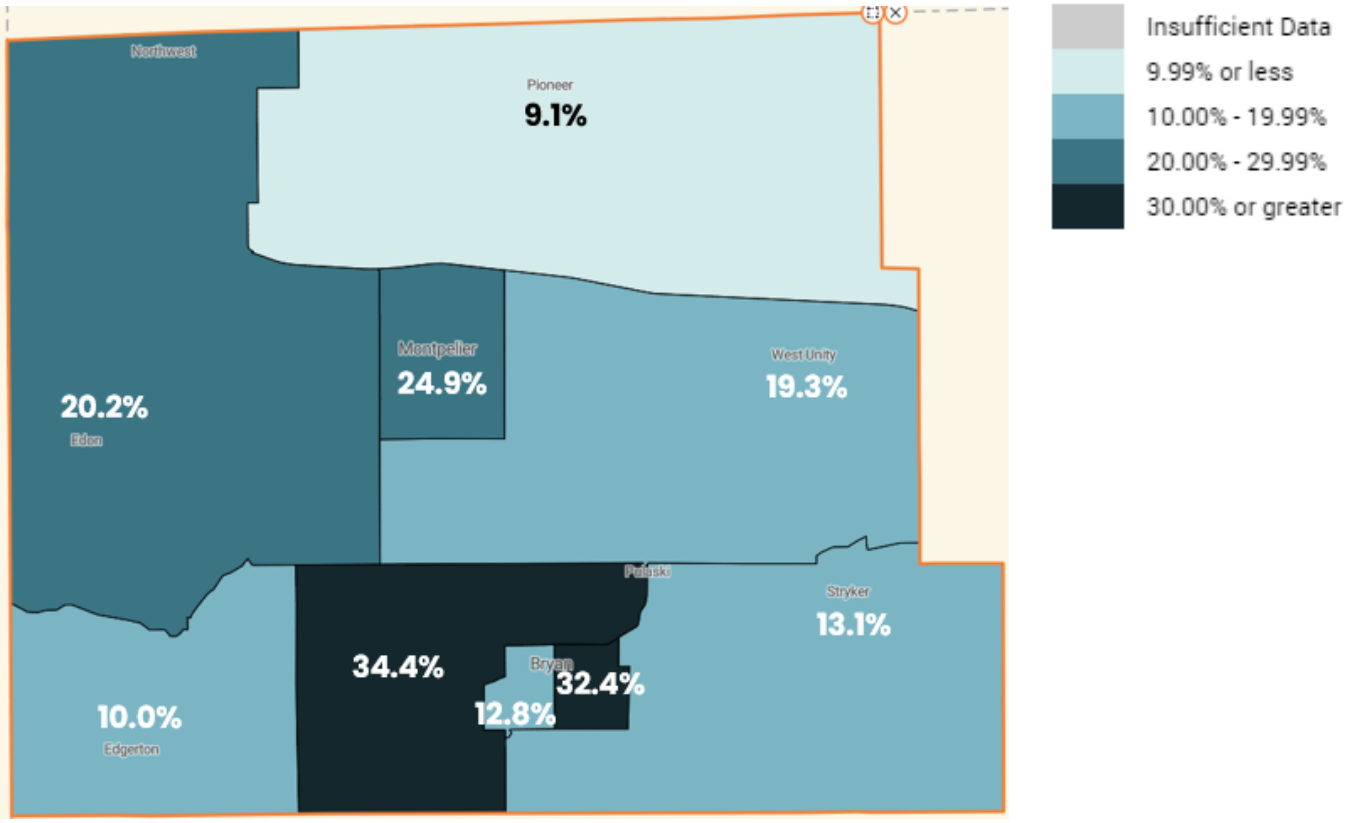
Figure 4



The Montpelier area had the highest percentage of houses built in 1979 or before with 76.3% and Edon area had the lowest percentage with 58.4%. East and West Bryan both had nearly 75% of houses built in 1979 or before. Areas located in the southeastern part of Williams County, such as Stryker, and East and West Bryan had higher percentages of houses that were built in 1979 or before with over 70%. Areas located in the western parts of Williams County such as Edon and Edgerton had the lowest percentages of houses built before 1979 with around 60%. Overall, houses built within cities such as Bryan and Montpelier had higher percentages of houses built before 1979 compared to smaller villages.

Children who live in poverty are also at risk for lead exposure. **Figure 5** shows poverty rates for children under 5 years old by census tract in Williams County.

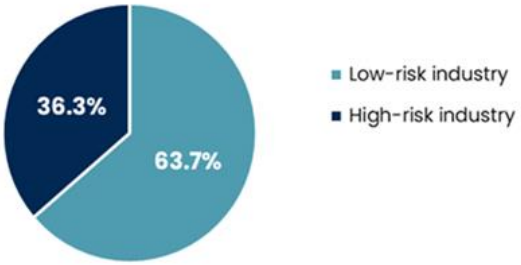
Figure 5



The Pioneer area had the lowest poverty rates among children under the age of 5 with 9.1% being in poverty and the Center area (rural area west of Bryan and north of Bryan) had the highest poverty rates with 34.4% being in poverty. Between East and West Bryan, poverty rates among children under age 5 in East Bryan were nearly 3 times higher than West Bryan. Nearly 25% of all children under age 5 in the Montpelier area were living in poverty. Overall, poverty rates among children under age 5 were lower in smaller villages compared to Bryan and Montpelier.

In addition to poverty and housing conditions, individuals who are employed in certain occupations such as **manufacturing** and **construction** can be at an increased risk of lead exposure. **Figure 6** shows that 36.3% of workers that are employed work in high-risk industries for lead exposure in Williams County.

Figure 6 Nearly 40% of workers work in **high risk industries** for lead exposure in Williams County



Babies and young children can also be more highly exposed to lead because they often put their hands and other objects that can have lead from dust or soil on them into their mouths. A pregnant woman's exposure to lead from these sources is of particular concern because it can result in exposure to her **developing baby**. During pregnancy, lead is released from the mother's bones along with calcium and can pass from the mother exposing the fetus or the breastfeeding infant to lead (EPA, 2023).

Williams County lead data:

In this report, the number of children under age six tested for blood lead by year, blood lead levels in Williams County children under age 6, and elevated vs not elevated blood lead level trends were analyzed. Information for all Williams County blood lead levels in children under age six was obtained from the Ohio Public Health Information Warehouse. Other data such as poverty rates, houses built before 1980 by census tract was obtained from other government sites such as U.S. Census, Ohio Department of Health Social Determinants of Health Dashboard, and PolicyMap. A 5-year period was chosen to show trends in blood lead levels in Williams County that can be compared with previous lead reports.

Figure 7 shows the total number of children under age six who were tested for lead in Williams County. 2022 had the most children tested for lead with 517 children and 2020 had the fewest children with 455. From 2018-2020, children that were tested for lead decreased, then increased from 2021-2022. Overall, from 2018-2022, the number of children under six years old being tested for lead has increased.

Figure 7 Number of children <6 years old tested for lead has **increased** since 2018

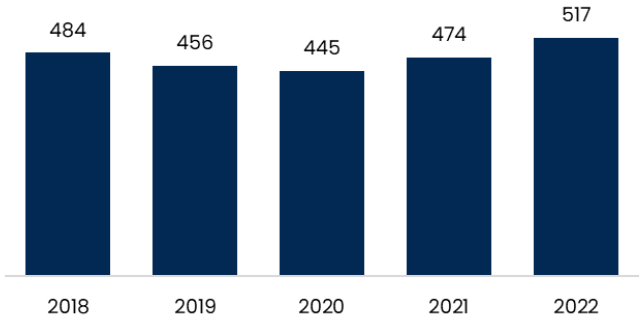
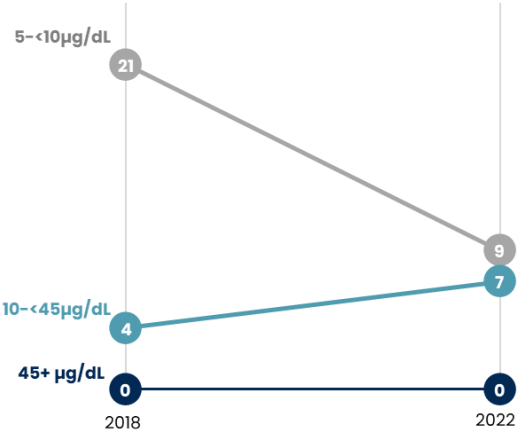


Figure 8 shows trends for all elevated blood lead levels among children under six years old from 2018-2022. From 2018 to 2022, the number of children who tested at **5-<10µg/dL** decreased from 21 to 9 children, while the number of children who tested at **10-<45µg/dL** increased from 4 to 7 children. Very high blood lead levels at **45+ µg/dL** remained the same from 2018-2022 with 1 child tested at that level. Even though Williams County saw an increase in the

number of children tested at blood lead levels between **10-<45 µg/dL**, overall, the number of children tested at elevated blood lead levels has decreased since 2018.

Figure 8 Number of children <6 years old tested at elevated blood lead levels from 2018-2022



Blood lead levels can be classified into two categories: **elevated** and **not elevated**. The Ohio department of heath classifies "elevated" blood lead levels as 5µg/dL and up, and "not elevated" blood levels as >5µg/dL. **Figure 9** shows trends for both elevated and not elevated blood levels in children <6 years old in Williams County from 2018-2022. From 2018-2022, not elevated blood lead levels were higher than elevated blood levels. Elevated blood levels have decreased since 2018 while not elevated blood levels have increased. The number of children who had not elevated blood levels decreased from 2018-2020, then increased in 2021-2022. Children who had elevated blood lead levels decreased from 2018-2021, then increased in 2022. **Figure 10** shows that the percentage of children who have elevated blood lead levels have decreased since 2018.

Figure 9

Elevated vs **Not elevated** blood lead levels among children < 6 years old by year

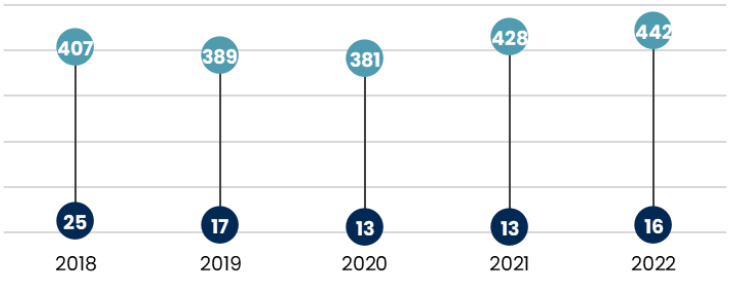
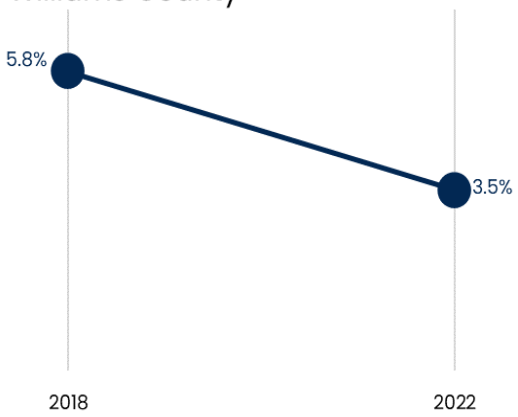


Figure 10

Elevated blood lead levels in children <6 years old have **decreased** since 2018 in Williams County



Prevention:

The most effective preventative measures against lead poisoning are to remove lead hazards from the environment before a child is exposed. Examples of ways to prevent lead poisoning are to wash hands and toys, run cold water for at least 1 minute before use, clean dusty surfaces with a wet mop or damp cloth, eat a healthy diet, get your home inspected for lead, avoid items that might contain lead, change shoes and clothes with lead dust on them, call water provider if unsure if water pipes were made of lead, and renovating safely. Listed below are ways to reduce and prevent lead exposure:

Wash hands and toys

Wash hands and toys to reduce hand-mouth transfer of contaminated dust or soil. Babies often put their hands and other objects that can have lead from dust or soil on them into their mouths.

Run cold water for at least 1 minute before use

Run cold water if you have plumbing containing lead pipes for **at least a minute** before using. The longer water is exposed to lead pipes or lead solder, the greater the possible lead contamination.

Clean dusty surfaces

Clean dusty surfaces with a wet mop or damp cloth. Lead dust is the most common way that people are exposed to lead.

Eat a healthy diet

Children need **calcium**, **vitamin C**, and **iron** to keep lead from being absorbed and stored in their bones.

Get your home inspected!

If your home was built **before 1978**, have your home inspected by a licensed lead inspector.

Avoid items that might contain lead

Avoid certain children's toys and products especially **imported or antique toys**. Avoid certain **antique ceramic or pottery dishes** that might be glazed with lead.

Change clothes and shoes with lead

If working in an occupation that might expose you to lead, change into clean clothes and shoes **before** coming home to minimize bringing home lead dust particles on clothing.

Call water provider

Call your water provider to find out of you have a lead service line connected to your home.

Renovate safely

Renovate safely and **avoid sanding** or **scraping** which can release dust. Use only approved methods for removing lead hazards from your home and use contractors certified with the EPA.

Additional lead resources:

- Call 1-877-LEADSAFE (532-3723) for more information about childhood lead poisoning and precautions for home renovation work.
- Visit the Ohio Department of Health website: https://www.odh.ohio.gov/odhprograms/eh/phs_environmental/leadlp/lead.aspx
- Visit the Environmental Protection Agency website: http://www2.epa.gov/lead
- Visit the National Center for Healthy Housing website: www.nchh.org
- Visit the Centers for Disease Control and Prevention website: http://www.cdc.gov/nceh/lead/
- If you rent, you may wish to call Legal Aid (1-888-534-1432) or First Call for Help (211). These agencies can resolve housing conditions that may be contributing to lead in the home.

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