Lead in Soil and Dust: Health Information for Families

What is lead?
Lead is a toxic metal that can be found in dust, soil, water, air, and food. No amount of lead is safe for health. Eliminating all lead exposure in our environment is the best course of action (NIEHS 2018; Tarragó & Brown, 2017).

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How are children affected by lead?
Lead exposure can cause serious health problems in children. Children exposed to lead often exhibit behavioral problems, lower IQs, hearing and speech problems, slowed growth, and learning disabilities. High levels of lead poisoning can also cause fatigue, crankiness, stomach aches, kidney damage, reproductive problems, seizures, coma, and even death (CDC, 2012, 2013; Tarragó & Brown, 2017).

How does soil become contaminated with lead?
Elevated soil lead levels can come from many sources including:

- *industrial pollution* - e.g., metal smelting, battery manufacturing, and other factories that use lead which gets into the air, falls to the ground and then mixes with the soil at playgrounds, homes, gardens
- *leaded paint on homes* - peeling and flaking lead-based paint can mix with soil close to buildings, and
- *leaded gas* - although lead in gasoline was banned completely in 1996, lead from car exhausts mixed with soil near roadways and can still be found in soil (Tarragó & Brown, 2017).

How does lead get into my child's body from soil or dust?
Children under the age of 6 are at greater risk for lead poisoning, because they often put hands and toys which may have lead dust on it, in their mouths. They also tend to be closer to the ground, crawling or playing in lead contaminated soil. There are two main routes of contact-through breathing it or eating:

- *Ingestion/Eating:* Ingestion is the most common form of lead exposure among children and adults and can occur through:
    - Swallowing leaded soil through hand-to-mouth activity,
    - Eating unwashed food from the garden, and
    - Eating washed food from the garden that has absorbed lead from soil
- *Inhalation/Breathing:* Lead in soil can be stirred up by the wind into lead dust, blowing into playgrounds, yards, and gardens. Breathing in dust from contaminated soil is the second most common route of contact and can occur through:
    - Industrial sources of lead pollution range in size from large mines and hazardous waste sites (e.g., Superfund sites) to small auto repair facilities.
    - Industries such as mining and lead smelting contribute to high levels of lead in the environment around such facilities.
    - People living near hazardous waste sites, incinerators, landfills may be exposed to lead and chemicals that contain lead by breathing air, drinking water, eating foods, or swallowing dust or dirt that contains lead (Tarragó & Brown, 2017).

What can I do to prevent lead exposure from soil and dust?

- Prevent children from playing in bare soil and near construction sites with dust
- Remove shoes before entering home
- Wash hands, bathe children after they come in contact with soil
- Wash soiled clothes after contact with soil/dust and in a separate load from other clothes.
- Spray playground areas that have bare soil with water to reduce dust
- Cover bare soil with grass, mulch, compost, or clean soil.
- If total soil lead levels exceed 1,200 ppm, replace soil (EPA, 2014, 2017; Stehouwer & Macneal).

What factors increase risk of high soil and dust lead levels?

- Urban areas are at highest risk of lead soil contamination, contamination can occur anywhere
- Land with a history of industrial or commercial use are often not ideal for child play areas, community gardens, or schools; however, lead-safe practices can reduce risk of exposure in these areas (EPA, 2011).
- Soil next to busy roads and homes/apartments built before 1978 are at highest risk of lead contamination.
- Areas with a history of mining, smelting or pesticide use also have a higher risk of elevated soil lead levels (Tarragó & Brown, 2017).
- Exposure from lead paint peeling or flaking from your home can be controlled. Lead-safe practices should be followed to protect your family.
    - Renovation and repair of lead-based paint needs to be done by trained professionals. It should not be a do-it-yourself project.
    - Under the Environmental Protection Agency's Lead Renovation, Repair, and Painting Rule (RRP Rule), contractors hired for renovation, repair, and painting projects that disturb lead-based paint must follow lead-safe practices as certified by the EPA. For more information visit: https://www.epa.gov/lead/renovation-repair-and-painting-program. https://www.epa.gov/lead/evaluating-and-eliminating-lead-based-paint-hazards.

How do I test soil for lead contamination? Soil testing is offered at little to no cost under the US Department of Agriculture's Cooperative Extension System.

- Screening is done by sending a soil sample to a lab in your state university system. To find a Cooperative Extension System in your state, visit https://nifa.usda.gov/land-grant-colleges-and-universities-partner-website-directory.
- When sampling, gardens and child play areas should be sampled and tested separately
- For a general description of how soil samples should be taken, please visit https://www.youtube.com/watch?v=GM7-19oSfD8.

What do soil test results mean?

- EPA has established "soil screening levels" (SSLs)
- SSLs for child play areas and garden areas should not exceed 400 parts per million (ppm)
    - SSLs below 400 ppm is relatively safe but should be covered with grass, mulch or compost
- SSLs between 400 and 1200 ppm should not be used for children's play areas or for gardens
- If soil lead levels exceed 1200 ppm, remedial action should be taken immediately and the area should be replaced with clean soil (EPA, 2014).

Is outdoor air tested for possible lead contamination? Enforcement of lead in the air is conducted under the Clean Air Act (CAA), which requires major sources, such as industries and utilities, to obtain operating permits and install pollution control equipment to meet specific emissions limitations

https://www.epa.gov/enforcement/air-enforcement. EPA has numerous ambient air quality monitoring programs under the CAA, including the Ambient Air Monitoring Program. This program collects national air quality data on criteria pollutants, including lead. The program is carried out by EPA and State and local air pollution agencies with oversight and guidance provided by EPA https://www.epa.gov/air-emissions-moinitoring-knowlede-base/basic-information-about-air-emissions-moinotiring.

Did you know?

- A blood test is the only way to be sure about your child's exposure to lead. It's important to know if children are being exposed to lead to prevent future exposures.
- All children should be tested at age 1 and again at age 2.
- Your child's health provider can manage lead exposure using these guidelines: https://georgetown.app.box.com/s/566t7wrgn6ecuoswg7pgqfsm8w185gxj.
- Children exposed to lead with high blood lead levels may be eligible for special education services under the Individuals with Disabilities Education Act (IDEA). For more information: https://sites.ed.gov/idea/.

Where can I find more information?

- Contact the **Mid-Atlantic Center for Children's Health and the Environment** toll free at **1-866-622-2431** or email us at kidsandenvironment@georgetown.edu**.** We serve residents of Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia. For those living in other states, go to www.pehsu.net to find your local regional center.
- Contact your state Poison Control Center at 1-800-222-1222 for emergency exposures.

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10/11/2018 la