

Possible Health Risks from Exposure to Arsenic, Lead, and Polycyclic Aromatic Hydrocarbons

35th Avenue Site Public Health Evaluation, North Birmingham, Alabama

Introduction

The United States Environmental Protection Agency (US EPA) sampled surface soil from over 1,100 residential properties and homegrown garden produce from a few area gardens at the 35th Avenue site. The Agency for Toxic Substances and Disease Registry (ATSDR) looked at the arsenic, lead, and polycyclic aromatic hydrocarbons (called PAHs) levels to see if people's contact with these compounds could harm their health.

ATSDR supports EPA's decision to clean properties in the 35th Avenue Site that have high levels of arsenic, lead, or PAHs in the surface soil. Cleaning these properties will lower people's exposure to these chemicals, thereby lowering the risk their health will be harmed.

This fact sheet tells how you can be exposed to arsenic, lead, and PAHs in surface soil and homegrown garden produce and how this exposure may affect your health. It also suggests steps you can take to protect your health.

How can I be exposed to chemicals in these communities?

Every day and mostly by accident, some people will swallow a little soil. Because gardeners touch soil more often, they are exposed to the chemicals in soil more often. Children may be exposed to chemicals in soil more than adults because they play in soil and put soil-covered toys and hands in their mouths. In fact, children get about twice as much soil in their bodies from their activities as do adults. Some children even eat soil on purpose. This doesn't happen often, and if it does occur, it usually involves only a few instances of eating soil.

People eat homegrown garden produce. Chemicals in the air can land on the surface of the produce, soil may stick to the surface of the produce, and chemicals can move from soil into the roots and other parts of the produce. When people eat this produce, chemicals can get into their bodies.



Will arsenic in surface soil affect my health?

Past and current exposure to arsenic found in surface soil of some residential yards may harm people's health. Children are at higher risk than adults.

- A few children eat soil on purpose. They may get nauseated, vomit, or have diarrhea soon after eating soil in yards with high levels of arsenic. About 20 yards in the past and 3 yards currently have enough arsenic that swallowing this soil may lead to these effects. These health effects will go away when they no longer eat soil with high levels of arsenic.
- Some children unintentionally swallow soil by putting toys, or their hands, with dirt on them in their mouths. The arsenic levels in two yards in the past and one yard currently are high enough that children unintentionally swallowing soil may get nauseated, vomit, or have diarrhea. These health effects will go away when they are no longer swallowing arsenic in soil.
- Children who unintentionally swallow soil every day for more than one year in yards with high levels of arsenic may develop skin problems. Sample results show 10 yards in the past and 2 yards currently



have arsenic in soil above levels that may lead to these effects. Children may develop dark skin (hyperpigmentation) and their skin may get more thick (hyperkeratosis) in some parts of their body.

- The American Cancer Society estimated 1 in 3 Americans will get some form of cancer during their lifetime. That means for every 10,000 people, on average 3,333 will get some kind of cancer. Exposure every day for many years to arsenic at 66 yards in the past and 30 yards currently may make the risk of getting cancer higher by one case – from 3,333 to

3,334. The actual number of people getting cancer caused by exposure to arsenic in soil may be higher or lower, and could be none, because this is an estimate.

- Arsenic in soil at most properties is not at levels of health concern for noncancer, harmful health effects and is in the range considered to be a low cancer risk.

Will lead in surface soil cause health problems?

Past and current exposure to lead found in surface soil in some residential yards may harm people's health. Children are at higher risk than adults.

- Unintentionally swallowing, or eating high levels of lead in soil, along with exposure to lead from other sources like lead-based paint in houses built before 1978, may cause people to develop health problems.
- Children and the developing fetuses of pregnant women are at higher risk of developing health effects caused by exposure to high levels of lead than adults.
- High levels of lead in blood are linked with health problems.
 - When too much lead builds up in a person's body, it can cause learning, hearing, and behavioral problems.
 - Very high levels of lead may harm the brain, kidneys, and other organs.
- Tests are available to let people know how much lead is in their blood.

Ways to prevent high levels of lead in blood include

- Eating 3 healthy meals a day and at least 2 healthy snacks, which can help lower, but not eliminate, the risk of getting high levels of lead in blood. People with empty stomachs absorb more lead into their bodies than people with full stomachs.

Ways to prevent high levels of lead in blood include



- Eating a balanced diet. People's bodies are less likely to absorb lead when their diet is rich in nutrients and vitamins.
 - Eat iron-rich foods like lean meat, chicken, and fish.
 - Eat calcium-rich foods like milk, yogurt, and cheese.
 - Eat foods high in Vitamin C like oranges and grapefruits.
- Eating less high fat and fried foods like hot dogs, french fries, and potato chips. People's bodies are more likely to absorb lead when they eat high fat and fried foods.
- Washing your hands before fixing food and washing and peeling garden produce before eating it. Lead particles that stick to people's hands after gardening and to the surface of garden produce can be washed away before the lead enters a person's body.
- Using only cold water from the tap for drinking, cooking, and for making baby formula. Hot water is more likely to contain lead. Run cold water 30 to 60 seconds before using.
- Unintentionally swallowing PAHs in soil every day for many years at 125 yards in the past and 64 yards currently may increase the risk of getting cancer by 1 in 10,000 people. Some PAHs are linked with stomach or lung cancer in people.
- The American Cancer Society estimated 1 in 3 Americans will get some form of cancer during their lifetime. That means for every 10,000 people, on average 3,333 will get some kind of cancer. We estimate the lifetime cancer risk of exposure to PAHs in soil may make that number higher by one case – from 3,333 to 3,334. The actual number of people getting cancer caused by exposure to PAHs in soil may be higher or lower, and could be none, because this is an estimate.

How can I reduce my family's exposure to arsenic, lead, and PAHs in surface soil?

US EPA may have told you that arsenic, lead, and polycyclic aromatic hydrocarbons (PAHs) are present in your yard at levels that need to be cleaned up. You can protect your health and your children's health by doing the following:

Will PAHs in surface soil cause health problems?

Exposure for many years to PAHs found in surface soil in some residential yards is at a level of concern for lifetime cancer risk.

- Wipe your shoes on a doormat or take your shoes off when you come into your house.
- Damp mop floors and damp dust counters and furniture often.
- Wash and peel all fruits, vegetables, and root crops raised on your property.



How can I reduce my family's exposure to arsenic, lead, and PAHs in surface soil?

- Wash pets often.
- Wash children's toys often. Separate indoor and outdoor toys.
- Wash children's hands and feet after they have been playing outside.
- Do not eat food, chew gum, or smoke when working in the yard.
- Parents monitor their children's behavior while playing outdoors and prevent their children from eating soil, or unintentionally swallowing it. A covered sandbox can reduce children's digging in soil in other areas of the yard.

Are the fruits and vegetables from my garden safe to eat?

- PAHs were not found in garden produce. Exposure to PAHs in produce should not cause health problems.
- The arsenic and lead levels found in garden produce are low. Eating garden produce should not cause health problems if this is the only way people are exposed to arsenic or lead. However, when people are also exposed to high levels of arsenic and lead in soil, or other ways, they are more likely to develop health problems.

Follow these steps to be sure garden produce is safe to eat:

- Wash and peel all root vegetables before cooking or eating
- Wash all leafy vegetables that grow close to the ground
- Add a little vinegar to the wash water to help remove soil from vegetables

Will ATSDR check my or my child's health or on any of our medical issues?

ATSDR works with groups that do practice environmental medicine. These groups help ATSDR teach and consult with the public about environmental issues. These groups have direct patient-care services. You will have to pay the cost of those patient care services. ATSDR can help you or your doctor by pointing you toward the groups that supply those services. Blood lead testing is covered by Medicaid and most other health insurance programs. The local health department may also provide blood lead testing in some cases.



For questions about ATSDR's work at the 35th Avenue Site contact:

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