

TO: Vermont Health Care Providers
FROM: Health Commissioner Mark Levine, MD

Lead Testing in School and Child Care Drinking Water

Vermont recently passed a law that requires all schools and child care providers to test for lead in their drinking water, and remediate when levels are at or above 4 ppb (parts per billion). The Health Department has started testing some schools, and the remainder are being scheduled throughout the 2019-2020 school year. Child care providers will be testing this summer.

The guidance provided here is intended to assist health care providers in determining whether or not blood lead testing is warranted (indicated) if a child has been drinking water found to have elevated levels of lead at school or child care. This health advisory reflects the complexity of factors that contribute to a child's exposure to lead, and considerations for blood lead testing. Please call the Environmental Health Division at 1-800-439-8550 if you have questions, or to discuss any blood lead test results.

Vermont Blood Lead Testing Requirements

Vermont law requires all children to be tested for lead at 12 months and again at 24 months. Children ages 36 to 72 months who have not previously been tested should also be tested. Refugee children ages 6 months to 16 years should be tested upon entry into the U.S.

Normally when a child has an elevated blood lead level (at or above 5 µg /dL – micrograms per deciliter), the Health Department tries to identify the source of the exposure. In this case, potential routes of exposure are being identified and reduced, but the question of whether to test the blood of those who may have been exposed remains.

Considerations for Testing Blood Lead Levels in Children When the School or Child Care Drinking Water Level Returns High

The amount of exposure for each individual child is unknown. Exposure is influenced by how much and how often they drink from the affected tap(s) and their body size. Using an EPA model, the Health Department developed estimates of the relationship between lead levels in drinking water and predicted blood lead levels.

These estimates assume that a child between 1 and 2 years old (the most sensitive population in a child care setting) or a child between 5 and 6 years old (most sensitive population in a school setting) consumes half of their daily water intake from an affected tap every day of the year.

The guidance that follows is based on our worst-case estimates of the contribution of drinking water to blood lead levels. However, a child's actual exposure at school or child care is likely to be less because:

- 1) Lead levels in drinking water generally decrease during the day if the drinking water fixture is being used (i.e. flush samples usually have lower lead levels than first draw samples).
- 2) Children may consume less than 50% of their daily water intake from one school or child care fixture.
- 3) Children likely do not drink from a school or child care fixture every day of the year.

While a lead level of 5 µg/dL or greater in blood is currently considered "elevated" for individual case management, no level of lead in the human body is considered to be safe.

If lead concentrations in drinking water are below 20 ppb (for 1- to 2-year-olds) or 35 ppb (for 5- to 6-year-olds), there is a low probability (less than 5%) that drinking water exposure will result in elevated blood lead levels (at or above 5 µg/dL).

As lead concentrations in drinking water increase from 20 ppb to 90 ppb (for 1- to 2-year-olds) or from 35 ppb to 100 ppb (for 5- to 6-year-olds), there is a greater probability of drinking water exposure resulting in elevated blood lead levels. Between 20 ppb and 90 ppb, the probability that an exposed 1- to 2-year-old will have a blood lead level at or above 5 µg/dL increases from 5% to 50%. Between 35 ppb and 105 ppb, the probability that an exposed 5- to 6-year-old will have a blood lead level at or above 5 µg/dL increases from 5% to 50%.

For lead in drinking water concentrations above 90 ppb (for 1- to 2-year-olds) or 105 ppb (for 5- to 6-year-olds), a child's probability of having an elevated blood lead level is greater than 50%. With a drinking water lead concentration at or above 90 ppb there is more than a 50% probability that a 1- to 2-year-old's blood lead level would be at or above 5 µg/dL. With a drinking water lead concentration at or above 105 ppb there is more than a 50% probability that a 5- to 6-year-old's blood lead level would be at or above 5 µg/dL. At these drinking water levels, we recommend that parents consult with their child's health care provider to discuss blood testing or next steps.

Other considerations for blood lead testing:

- potential for additive effects through exposure to lead in a house or apartment building built before 1978, or an adult who has occupational exposure to lead
- previously identified behavioral or academic problems
- parent's concern and desire to know if the child has been exposed
- developmental problems/delays or behavioral problems such as aggression, hyperactivity, attention deficit, school problems, learning disabilities, excessive mouthing or pica behavior

- signs consistent with lead poisoning: irritability, headaches, vomiting, seizures or other neurological symptoms, anemia, loss of appetite, abnormal pain, cramping or constipation

Clinical Treatment Guidelines

For blood lead levels between 5 µg/dL and 45 µg/dL, the primary intervention is to stop the exposure. After the exposure is stopped, it takes at least a month for the blood lead level to drop by half. Medical intervention (chelation therapy) is indicated only for blood lead levels of 45 µg/dL and higher. Clinical treatment guidelines for confirmed blood lead levels can be found at the Health Department's website:

www.healthvermont.gov/sites/default/files/documents/pdf/Env_CEH_BLTTestingGuidelines.pdf

Vermont Action Level (4 ppb), AAP Recommendation and Vermont Health Advisory (1 ppb)

The new state law for lead in school and child care drinking water establishes a Vermont Action Level of 4 ppb for fixtures used for drinking or cooking in these facilities. The American Academy of Pediatrics recommends lead in drinking water not exceed 1 ppb. Because there is no safe level of lead, the Health Department has established a Vermont Health Advisory of 1 ppb, and encourages all Vermonters to reduce lead levels in drinking water as low as possible.

Report blood lead test results – In addition to your normal blood lead reporting, if you decide to test a patient, please send the patient's name and date of birth to the Health Department at AHS.HealthyHomes@vermont.gov or by calling 1-800-439-8550. The patient's name and date of birth will allow us to match their blood lead result with their school or child care facility.

Questions – Call the Environmental Health Division at 1-800-439-8550 for questions about this health advisory or to discuss any blood lead test results.

For more information –

Schools - healthvermont.gov/school-drinking-water

Child cares - healthvermont.gov/childcare-drinking-water

Lead Results for Schools and Child Cares- <https://anrweb.vt.gov/DEC/leadinschools>

HAN Message Type Definitions

Health Alert: Conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: Provides important information for a specific incident or situation may not require immediate action.

Health Update: Provides updated information regarding an incident or situation; unlikely to require immediate action.

Info Service Message: Provides general correspondence from VDH, which is not necessarily considered to be of an emergent nature.