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- Lead in imported spices: Elevated blood lead levels and guidance for blood testing and exposure assessment

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Key Messages:

- Clinicians should be aware of the various causes of elevated blood lead levels in patients; including items purchased abroad, such as spices.
- Public Health Ontario has recently provided updated guidance for clinical management based on blood lead level.
- This update includes an interpretation algorithm of blood lead tests based on the most recent Health Canada data and an updated exposure history assessment tool.

How to order blood lead level (BLL) testing:

Indicate **blood lead test** on requisition under “Other tests”. Please note that the Public Health Ontario Laboratory no longer offers this test.

Lead toxicity: clinical presentation

Common [symptoms of acute lead toxicity](#) include:

- abdominal pain;
- fatigue, and general malaise;
- myalgias and arthralgias;
- headaches; and
- peripheral neuropathy.

Chronic lead exposure can have [long-term sequelae](#), including chronic interstitial nephritis, increased risk of hypertension, adverse reproductive effects, and neurological deficits related to learning, attention and development, especially in children.

Interpreting results of blood lead level (BLL) testing

[Public Health Ontario](#) has provided the following guidance for management based on BLL for the general population:

BLL greater than 5 µg/dL (or 0.24 µmol/L):

- identify and eliminate the source of exposure
- in children, or in pregnancy and lactation, correct calcium/iron deficiency if present
- repeat levels in 3 months to evaluate effectiveness of intervention(s)

BLL greater than 10 µg/dL (or 0.48 µmol/L):

- above, and
- if home or community exposure is suspected, contact public health for assistance in identifying/eliminating the source of exposure

Lead in imported spices: Elevated blood lead levels and guidance for blood testing and exposure assessment

Certain individuals may be at an increased risk of lead exposure due to their occupation, use of tobacco or other consumer goods containing lead (e.g., traditional medicines, cookware, toys), recent travel and diet.

Peel Public Health investigated two households with elevated blood lead levels in 2021 and 2024. In both cases, spices purchased abroad were identified as the exposure source. One of these spices was found to have lead levels greater than 3,300 ppm. Turmeric, particularly, appears to be a spice associated with high lead levels. There is currently no Health Canada established maximum allowable limit for lead in spices, however, the average lead levels found in [spices in Canada](#) is 0.31 ppm (range 0 to 1.84 ppm).

Spices purchased outside of Canada have been identified as a lead exposure risk. Lead may be added intentionally as a coloring agent or to add weight for products, or it can be introduced unintentionally because of poor processing equipment or due to lead contamination in the air, dust, or soil where food is grown.

BLL greater than **40 µg/dL (or 1.9 µmol/L)**:

- above, and
- consider referral for specialist assessment (Ontario Poison Centre or occupational medicine specialist)
- repeat BLL in 4 weeks

BLL greater than **50 µg/dL (or 2.4 µmol/L)**:

- above, and
- obtain complete blood count and creatinine level
- refer for specialist assessment (Ontario Poison Centre or occupational medicine specialist)

For further information on lead exposure or test interpretation, call Peel Public Health at 905-799-7700. In addition, report any suspicious or confirmed lead-containing products to [Health Canada](https://www.healthcanada.ca).

Table 1 can be used to evaluate age-specific BLL.

Table 1 Age-specific Population Blood Lead Levels

Age (years)	GM* - µg/dL** (confidence interval)	95 th Percentile - µg/dL** (confidence interval)
1-5	0.67 (0.60–0.75)	2.0 (1.7–2.4)
3-5	0.50 (0.44–0.58)	1.2 (0.39–2.0)
6 to 11	0.49 (0.44–0.55)	1.2 (0.31–2.0)
12 to 19	0.47 (0.43–0.52)	1.2 (0.82–1.5)
20 to 39	0.71 (0.66–0.76)	1.9 (1.4–2.5)
40 to 59	0.92 (0.86–1.0)	2.2 (1.9–2.5)
60 to 79	1.3 (1.2–1.4)	3.1 (2.8–3.5)

*geometric mean

**1 µg/dL = 20.7 µmol/L

When taking an [exposure history](#) consider probing on the following sources:

Community:

- Proximity to industrial or former industrial site(s), waste disposal facility, heavy traffic, farm(s).
Examples: Lead smelter, battery recycling facility.

Home:

- Homes built before 1950, history of renovations, pesticide/herbicide use in home/garden, pets, cleaning products. Examples: lead pipes/solder, lead-based paint/flaking paint, carpet, vinyl blinds,

imported products such as toys, crayons, ceramics, cookware/houseware, utensils, candles.

Hobbies:

- Work with stained glass, oil-based paints or varnishes. Examples: Ceramics glazes, preparation of lead shot/ammunition or fishing lures, lead soldering, furniture refinishing.

Occupation:

- Work/school/volunteer activities, work environment (air quality, noise, dust, chemical use). Examples: Target shooting, lead mining and refining, plumbing and pipe fitting, battery manufacturing and recycling, plastics manufacturing, metal processing.

Personal Behaviors:

- Smoking, second-hand smoke, personal care products, pica, recent travel/immigration. Examples: Kohl, kajal, and surma (traditional eye makeup), sindoor (used for religious ceremonies or food additive), imported cosmetics, ceremonial powders, and skin creams, amulets (sheesha, tabiz, and other metal charms).

Diet:

- Drinking water source, sport fish consumption. Examples: Leaded plumbing and fittings, imported/adulterated foods such as spices, candies, and cookies.

Drugs:

- Over the counter or brought in from other countries, vitamins, supplements, traditional medicines. Examples: Azarcon for infant colic, folk remedies ghasard, greta and pay-loo-ah, ayurvedic medicines.

For information on additional lead exposure sources refer to:

- [Health Canada](https://www.healthcanada.ca)
- [United States Environmental Protection Agency](https://www.epa.gov)
- [U.S. Centers for Disease Control and Prevention](https://www.cdc.gov)
- [NYC Health](https://www.nyc.gov)