



Portland Metal Exposures: *Interim* Clinical Update May 6, 2016

Jointly developed by Multnomah County Health Department (MCHD), Oregon Health Authority (OHA), Northwest Pediatric Environmental Health Specialty Unit (NWPEHSU), Oregon Poison Center (OPC)

UPDATE May 6, 2016- Free testing for residing, working, or attending school within 0.5 mile of either glass factory

The Oregon Health Plan (OHP) and most private insurance plans will cover urine cadmium testing for members who live in the highest-risk areas.

For Oregon residents who live, work, or go to school or day care within one-half mile of Bullseye Glass Company or Uroboros Glass, Oregon Health Authority (OHA) will cover the cost of urine cadmium testing. To be tested, patients should be advised to call [971-673-3308](tel:971-673-3308) (9:00 am to 4:00 pm, M-F) to determine qualification.

Background: Elevated levels of airborne metals were documented in October 2015 near one glass factory in SE Portland. Preliminary data from an unpublished US Forest Service tree moss study suggests there may be sources of airborne metals at other urban sites including a second glass factory in North Portland. More information will become available over the next several months. Read more at the joint website of multiple state and local agencies: <http://saferair.oregon.gov/Pages/index.aspx>

Current and Past Human Health Risk Near Glass Factories: Soil and air testing near the glass factories by the Oregon Department of Environmental Quality in February and March 2016 did not detect metals at levels beyond that expected in an urban area. Preliminary assessment of human cancer risk from past arsenic and cadmium exposure in these neighborhoods did not reveal excess cases above Multnomah County background rates. As of 3/19/16, cadmium at any level has been reported in 13 (3 %) of 396 urine cadmium tests reported among Multnomah County residents. Of these, 4 (1 %) individuals had a level that could be associated with renal dysfunction. A more comprehensive environmental health assessment will be completed later in 2016.

Toxicity of Arsenic, Cadmium, Chromium, and Nickel: The benchmark air levels of metals that were documented at the SE 22nd and Powell site are based on the probability of lifetime cancer risk from chronic exposure. The 4 attached brief ToxGuides™ provide more detail on metals detected at levels above these health-based benchmarks.

Who needs to be tested? It is not medically necessary to screen otherwise healthy people for metals because of exposures near these glass factories. This recommendation will be updated, if needed, after environmental health assessments are complete. We realize that some patients are concerned and will request testing.

Testing Considerations If you deem testing to be appropriate, then follow the suggestions in the Table. First morning void urine specimens are preferred. Be aware of these considerations and limitations:

- 24 hour urine is not needed; blood tests may be appropriate in some situations but are not recommended for screening.
- No seafood, seaweed or sushi consumption for at least 3 days prior to arsenic testing.

- No nutritional supplements for 3 days before chromium testing.
- Cadmium levels may be elevated in cigarette smokers.
- Nickel testing should be delayed for at least 3 days after consumption of nuts, an MRI study with gadolinium or an iodinated IV contrast study.
- Arsenic and chromium are rapidly excreted; testing will mostly detect current exposure.
- Cadmium has an extremely long half-life and testing mostly reflects chronic exposure.
- Nickel excretion is complex and can reflect both acute and chronic exposure.
- With the exception of cadmium, human threshold metal levels in urine have not been determined for risk of organ damage.
- Commercial reference labs often focus on occupational monitoring; lab results that identify workplace hazards may not document lower level exposures.
- Testing of hair or nails is not clinically useful and is not currently recommended by federal experts.(http://www.atsdr.cdc.gov/HAC/hair_analysis/hair_analysis.pdf)
- **Under no circumstances should chelation or provocation be used before testing since this will invalidate comparison to reference ranges.**

Interpretation Thresholds for additional testing and consultation are listed in the Table, note:

- Results below the limit of detection in micrograms/Liter (mcg/L) do not need medical follow up.
- False positives may occur in results reported in mcg/gram creatinine in children because they excrete less creatinine than adults; results in mcg/L that are undetectable require no action.

Table Screening tests for patients concerned about environmental exposure to metals¹

Metal	Screening Test	Results requiring additional testing or consultation
Arsenic	Random urine, arsenic ²	All ages: > 50 mcg/L inorganic Arsenic ³ All ages: > 200 mcg/L inorganic Arsenic, obtain consultation ⁴
Cadmium	Random urine, cadmium ⁵	All ages: any detectable urine Cadmium, obtain consultation ⁴
Chromium	Random urine, chromium	All ages: >5mcg/L Chromium, obtain consultation ^{4,6}
Nickel	Random urine, nickel	All ages: >30 mcg/L Nickel, obtain consultation ⁴

¹Consensus recommendations of, OHA, OPC, and NW PESHU toxicologists using national data and clinical correlation

²Total urinary arsenic of > 35 mcg/L should be fractionated to identify inorganic arsenic. (The methyl and organic fraction concentrations are not health concerns; only the inorganic fraction requires further consideration³).

³ For >50 mcg/L inorganic arsenic also obtain CBC, electrolytes, BUN, creatinine, urinalysis, AST, ALT, bilirubin, and repeat fractionated urinary arsenic. This guidance is focused on exposure levels that may be possibly associated with current end organ damage. Lower degrees of exposures have been associated with neurodevelopmental health outcomes and increased cancer risk but thresholds are not available

⁴Oregon Poison Center (1-800-222-1222)

⁵National norms for blood cadmium are available for children age 1-5 years but blood may not accurately reflect chronic exposure

⁶ This level only indicates amounts above laboratory reference upper limits. National norms are not available.

Obtaining expert consultation: For patients with lab results exceeding levels listed in the Table, obtain additional tests or consultation. Medical toxicology consultation is available through the Oregon Poison Center (1-800-222-1222). If necessary, the Poison Center will refer calls regarding children or pregnancy to the NW PEHSU (1-877-KID-CHEM).

Sharing results with public health agencies: A system for labs to report detectable levels of cadmium was launched on February 18th, 2016. To report patients' results from prior to February 18th, please fax to 971-673-1100.



Recommendations for patients and families: Any risk from emissions from the glass factories in Portland adds to other exposures from living in a city. Recommendations for patients and families include:

- Always avoid cigarette smoke- arsenic and cadmium are among its many harms.
- Eat a healthy diet including selenium (nuts, whole grains), iron (enriched cereals, meat, beans), calcium (milk products, leafy greens) and folate (beans, spinach, avocado). Dietary deficiency in some of these nutrients can exacerbate metal toxicity.
- Wash hands after working or playing outdoors; soil can be contaminated with a variety of metals
- Soil testing results from the areas closest to the glass factories indicated that urban gardening can continue with normal precautions. This formally rescinds our prior recommendations to avoid consuming backyard produce.