

Overview

Useful For

Detecting clinically significant lead exposure due to occupational exposure

This test is **not a substitute** for blood lead screening.

Profile Information

| Test Id | Reporting Name             | Available Separately | Always Performed |
|---------|----------------------------|----------------------|------------------|
| PBOU    | Lead Occupational Exposure | No                   | No               |
| CRETR   | Creatinine, Random, U      | No                   | No               |

Special Instructions

- [Metals Analysis Specimen Collection and Transport](#)

Method Name

PBOU: Triple Quadrupole Inductively Coupled Plasm Mass Spectrometry (ICP-MS/MS)

CRETR: Enzymatic Colorimetric Assay

NY State Available

Yes

Specimen

Specimen Type

Urine

Ordering Guidance

The Centers for Disease Control and Prevention recommends venous blood collection for lead testing; see PBDV / Lead, Venous, with Demographics, Blood.

Specimen Required

**Patient Preparation:** High concentrations of gadolinium and iodine are known to interfere with most metal tests. If either gadolinium- or iodine-containing contrast media has been administered, **a specimen should not be collected for 96 hours.**

**Supplies:** Urine Tubes, 10 mL (T068)

**Collection Container/Tube:** Clean, plastic urine container with no metal cap or glued insert

**Submission Container/Tube:** Plastic vial or clean, plastic aliquot container with no metal cap or glued insert

**Specimen Volume:** 3 mL

Collection Instructions:

1. Collect a random urine specimen.
2. See [Metals Analysis Specimen Collection and Transport](#) for complete instructions.

Specimen Minimum Volume

1.5 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

| Specimen Type | Temperature              | Time    | Special Container |
|---------------|--------------------------|---------|-------------------|
| Urine         | Refrigerated (preferred) | 28 days |                   |
|               | Ambient                  | 14 days |                   |
|               | Frozen                   | 28 days |                   |

Clinical & Interpretive

Clinical Information

Lead toxicity primarily affects the gastrointestinal, neurologic, and hematopoietic systems. Increased urine lead concentration per gram of creatinine indicates significant lead exposure. Measurement of urine lead concentration per gram of creatinine before and after chelation therapy has been used as an indicator of significant lead exposure. However, the American College of Medical Toxicology (ACMT 2010) position statement on post-chelator challenge urinary metal testing states that "post-challenge urinary metal testing has not been scientifically validated, has no demonstrated benefit, and may be harmful when applied in the assessment and treatment of patients in whom there is concern for metal poisoning.

Lead blood measurement is the best test for clinical correlation of toxicity. For more information see PBDV / Lead, Venous, with Demographics, Blood.

Reference Values

LEAD/CREATININE:

Biological Exposure Index (BEI): <150 mcg/g creatinine

CREATININE:

> or =18 years: 16-326 mg/dL

Reference values have not been established for patients who are younger than 18 years of age.

Interpretation

Measurements of urinary lead levels have been used to assess lead exposure. However, like blood lead, urinary lead excretion mainly reflects recent exposure and, thus, shares many of the same limitations for assessing lead body burden or long-term exposure.(1,2)

Urinary lead concentration increases exponentially with blood lead and can exhibit relatively high intra-individual variability, even at similar blood lead concentrations.(3,4)

**Cautions**

No significant cautionary statements

**Clinical Reference**

1. Sakai T. Biomarkers of lead exposure. Ind Health. 2000;38(2):127-142
2. Skerfving S. Biological monitoring of exposure to inorganic lead. In: Clarkson TW, Friberg L, Nordberg GF, Sager PR, eds. Biological Monitoring of Toxic Metals. Rochester Series on Environmental Toxicity. Springer; 1988:169-197
3. Gulson BL, Jameson CW, Mahaffey KR, et al. Relationships of lead in breast milk to lead in blood, urine, and diet of the infant and mother. Environ Health Perspect. 1998;106(10):667-674
4. Skerfving S, Ahlgren L, Christoffersson JO. Metabolism of inorganic lead in man. Nutr Res. 1985;Suppl 1:601-607
5. Kosnett MJ, Wedeen RP, Rotherberg SJ, et al. Recommendations for medical management of adult lead exposure. Environ Health Perspect. 2007;115(3):463-471
6. De Burbane C, Buchet JP, Leroyer A, et al. Renal and neurologic effects of cadmium, lead, mercury, and arsenic in children: evidence of early effects and multiple interactions at environmental exposure levels. Environ Health Perspect. 2006;114(4):584-590
7. Strathmann FG, Blum LM. Toxic elements. In: Rifai N, Chiu RWK, Young I, Burnham CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 44
8. Hauptman M, Bruccoleri R, Woolf AD. An update on childhood lead poisoning. Clin Pediatr Emerg Med. 2017;18(3):181-192. doi:10.1016/j.cpem.2017.07.010

**Performance****Method Description**

The metal of interest is analyzed by triple-quadrupole inductively coupled plasma mass spectrometry.(Unpublished Mayo method)

**PDF Report**

No

**Day(s) Performed**

Monday through Friday

**Report Available**

2 to 4 days

**Specimen Retention Time**

14 days

**Performing Laboratory Location**

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

83655  
82570

LOINC® Information

| Test ID | Test Order Name             | Order LOINC® Value |
|---------|-----------------------------|--------------------|
| PBUOE   | Lead Occupat Exp, Random, U | 13466-8            |

| Result ID | Test Result Name           | Result LOINC® Value |
|-----------|----------------------------|---------------------|
| CRETR     | Creatinine, Random, U      | 2161-8              |
| 608894    | Lead Occupational Exposure | 13466-8             |