

## Overview

### Useful For

Detecting clinically significant lead exposure due to occupational exposure  
This test is **not a substitute** for blood lead screening.

### Special Instructions

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

### Profile Information

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

### Method Name

PBOU: Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)

CRETR: Enzymatic Colorimetric Assay

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Ordering Guidance

The CDC 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 metals 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 [Trace Metals Analysis Specimen Collection and Transport](#) in Special Instructions for complete instructions.

### Reject Due To

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

### Specimen Minimum Volume

1.5 mL

### Specimen Stability Information

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

Blood lead is the best clinical correlation of toxicity. For additional information, see PBDV / Lead, Venous, with Demographics, Blood.

### Reference Values

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

### Interpretation

Measurements of urinary lead levels have been used to assess lead exposure. However, like lead blood, 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

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5. Kosnett MJ, Wedeen RP, Rotherberg SJ, et al: Recommendations for medical management of adult lead exposure. Environ Health Perspect. 2007;115:463-471
  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;114:584-590
  7. Strathmann FG, Blum LM: Toxic elements. In: Rafai N, Horwath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:chap 42

## Performance

### Method Description

Lead (Pb) in urine is analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) in kinetic energy discrimination (KED) mode using gallium (Ga), rhodium (Rh), and iridium (Ir) as internal standards and a 5% nitric acid salt matrix calibration. (Unpublished Mayo method)

### PDF Report

No

### Specimen Retention Time

14 days

### Performing Laboratory Location

Rochester

## Fees & Codes

### Test Classification

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

### CPT Code Information

83655

82570