
Overview

Useful For

Detecting clinically significant lead exposure in 24-hour specimens

This test is not a substitute for blood lead screening.

Special Instructions

- [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#)
- [Trace Metals Analysis Specimen Collection and Transport](#)

Method Name

Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)

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

Necessary Information

24 Hour volume is required.

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, 10-mL urine tube or a clean, plastic aliquot container with no metal cap or glued insert

Specimen Volume: 10 mL

Collection Instructions:

1. Collect urine for 24 hours.
2. Refrigerate specimen within 4 hours of completion of 24-hour collection.
3. See [Trace Metals Analysis Specimen Collection and Transport](#) in Special Instructions for complete instructions.

Additional Information: See [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#) in Special Instructions for multiple collections.

Urine Preservative Collection Options

Note: The addition of preservative or application of temperature controls **must occur within 4 hours of completion** of the collection.

Ambient	OK
Refrigerate	Preferred
Frozen	OK
50% Acetic Acid	OK
Boric Acid	No
Diazolidinyl Urea	No
6M Hydrochloric Acid	OK
6M Nitric Acid	OK
Sodium Carbonate	No
Thymol	No
Toluene	No

Reject Due To

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

Specimen Minimum Volume

2 mL

Specimen Stability Information

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

Clinical & Interpretive**Clinical Information**

Increased urine lead excretion rate indicates significant lead exposure. Measurement of urine lead excretion rate before **and** after chelation therapy has been used as an indicator of 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."

For additional information, see PBDV/ Lead, Venous, with Demographics, Blood.

Reference Values

0-17 years: not established

> or =18 years: <2 mcg/24 hour

Interpretation

Measurements of urinary lead (Pb) 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 Pb 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. 988:169-197
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;115:463-471

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 Apr;114(4):584-590

7. Pascal DC, Ting BG, Morrow JC, et al: Trace metals in urine of United States residents: reference range concentrations. Environ Res. 1998 Jan;76(1):53-59

8. Strathmann FG, Blum LM: Toxic elements. In: Rifai 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

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
PBU	Lead, 24 Hr, U	5677-0

Result ID	Reporting Name	LOINC®
31085	Lead, 24 Hr, U	5677-0
TM83	Collection Duration	13362-9
VL84	Urine Volume	3167-4