Test Definition: PBU

Lead, 24 Hour, Urine

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
- Metals Analysis Specimen Collection and Transport

Method Name

Triple-Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS/MS)

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

Necessary Information

24-Hour volume (in milliliters) is required.

Specimen Required

Patient Preparation: High concentrations of gadolinium and iodine are known to potentially interfere with most inductively coupled plasma mass spectrometry-based 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, 10-mL urine tube or a clean, plastic aliquot container with no metal cap or glued insert
Specimen Volume: 3 mL
Collection Instructions:
1. Collect urine for 24 hours.
2. Refrigerate specimen within 4 hours of completion of 24-hour collection.

3. See Metals Analysis Specimen Collection and Transport for complete instructions.
Additional Information: See Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens 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 (no additive)	OK
Refrigerate (no additive)	Preferred
Frozen (no additive)	OK
50% Acetic Acid	OK
Boric Acid	No
Diazolidinyl Urea	No
6M Hydrochloric Acid	OK
6M Nitric Acid	OK
Sodium Carbonate	No
Toluene	No

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	28 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

An increased urine lead excretion rate indicates significant lead exposure. Measurement of urine lead excretion rate before and after chelation therapy has been used to assess lead exposure. However, the American College of Medical Toxicology position statement (ACMT 2010) 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."(1)

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

Reference Values

0-17 years: Not established
> or =18 years: <2 mcg/24 h

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, therefore, shares many of the same limitations for assessing lead body burden or long-term exposure.(2,3)

Urinary lead concentration increases exponentially with blood lead and can exhibit relatively high intra-individual variability, even at similar blood lead concentrations.(4,5)

Cautions

No significant cautionary statements.

Clinical Reference

1. American College of Medical Toxicology. American College of Medical Toxicology position statement on post-chelator challenge urinary metal testing. J Med Toxicol. 2010;6(1):74-75. doi:10.1007/s13181-010-0039-0
2. Sakai T. Biomarkers of lead exposure. Ind Health. 2000;38(2):127-142
3. 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
4. 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
5. Skerfving S, Ahlgren L, Christoffersson JO. Metabolism of inorganic lead in man. Nutr Res. 1985;Suppl 1:601-607
6. Kosnett MJ, Wedeen RP, Rothenberg SJ, et al. Recommendations for medical management of adult lead exposure. Environ Health Perspect. 2007;115(3):463-471
7. de Burbure 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
8. Paschal DC, Ting BG, Morrow JC, et al. Trace metals in urine of United States residents: reference range concentrations. Environ Res. 1998;76(1):53-59
9. 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
10. 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

Performance

Method Description

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

PDF Report

No

Day(s) Performed
Monday through Friday

Report Available
1 to 3 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

LOINC® Information

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

Result ID	Test Result Name	Result LOINC® Value
31085	Lead, 24 Hr, U	5677-0
TM83	Collection Duration (h)	13362-9
VL84	Volume (mL)	3167-4