Test Definition: TLU

Thallium, 24 Hour, Urine

Overview

Useful For

Detecting toxic thallium exposure in 24-hour urine collections

Special Instructions

- Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens
- Metals Analysis Specimen Collection and Transport

Method Name

Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

NY State Available

Yes

Specimen

Specimen Type

Urine

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: 10 mL

Collection Instructions:

1. Collect urine for 24 hours.
2. Refrigerate specimen within 4 hours of completion of 24-hour collection.
3. Aliquot 10 mL into a plastic 10-mL urine tube (T068) or a clean, plastic aliquot container with no metal cap or glued insert.
4. See Metals Analysis Specimen Collection and Transport for complete instructions.

Additional Information: For multiple collections, 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
Thymol	No

Specimen Minimum Volume

0.3 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

Thallium is odorless, tasteless, and found in trace amounts in the earth's crust. It is used in the manufacturing of electronic devices, switches, and closures. It has previously been used in rodenticides. The greatest exposure can occur from eating food (eg, fruits and vegetables) since it is easily taken up by plants through the roots. Cigarette smoking is also a source of exposure. Accidental ingestion may lead to vomiting, diarrhea, and leg pains, followed by severe and sometimes fatal sensorimotor polyneuropathy. Peripheral neuropathy may occur within 1 week of exposure, while hair loss begins and continues for several weeks. Gastrointestinal symptoms, including pain, diarrhea, and constipation have also been reported in acute ingestion, along with myalgias, pleuritic chest pain, insomnia, optic neuritis, hypertension, cardiac abnormalities, Mees lines, and liver injury. Most thallium is excreted in the urine, can be found within an hour after exposure, and can be detected as long as two months after exposure.

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

Interpretation
Patients exposed to high doses of thallium (>1 g) present clinically with alopecia, peripheral neuropathy, seizures, and kidney failure.

Exposed patients can have urine output greater than 10 mcg/day. The long-term consequences of such an exposure are poor.

Cautions
No significant cautionary statements

Clinical Reference
1. Bank WJ, Pleasure DE, Suzuki K, Nigro M, Katz R. Thallium poisoning. Arch Neurol. 1972;26(5):456-464
2. Pelclova D, Urban P, Ridson P, et al. Two-year follow-up of two patients after severe thallium intoxication. Hum Exp Toxicol. 2009;28(5):263-272
3. Zhao G, Ding M, Zhang B, et al. Clinical manifestations and management of acute thallium poisoning. Eur Neurol. 2008;60(6):292-297
4. Agency for Toxic Substances and Disease Registry: Toxicological profile for thallium. US Department of Health and Human Services; October 2024. Accessed September 4, 2025. Available at atsdr.cdc.gov/ToxProfiles/tp54.pdf
5. Strathmann FG, Blum LM. Toxic elements. In: Rifai N, Chiu RWK, Young I, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 44
6. Duan W, Wang Y, Li Z, et al. Thallium exposure at low concentration leads to early damage on multiple organs in children: A case study followed-up for four years. Environ Pollut. 2020;;258:113319. doi:10.1016/j.envpol.2019.113319

Performance

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

PDF Report
No

Day(s) Performed
Tuesday, Friday

Report Available
2 to 5 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

83018

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
TLU	Thallium, 24 Hr, U	5746-3

Result ID	Test Result Name	Result LOINC® Value
8603	Thallium, 24 Hr, U	5746-3
TIME2	Collection Duration (h)	13362-9
VL12	Volume (mL)	3167-4