MAYO CLINIC LABORATORIES

Test Definition: TLUCR

Thallium/Creatinine Ratio, Random, Urine

Overview

Useful For

Detecting toxic thallium exposure in random urine specimen

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
TLUC	Thallium/Creat Ratio, U	No	Yes
CRETR	Creatinine, Random, U	No	Yes

Special Instructions

- Metals Analysis Specimen Collection and Transport

Method Name

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

CRETR: Enzymatic Colorimetric Assay

NY State Available

Yes

Specimen

Specimen Type

Urine

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 collection 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: 7 mL

Collection Instructions:

1. Collect a random urine specimen.
2. See Metals Analysis Specimen Collection and Transport for complete instructions.

Specimen Minimum Volume

1.3mL

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

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 had 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

THALLIUM:
0-17 years: Not established
> or =18 years: <2 mcg/g creatinine

CREATININE:
> or =18 years old: 16-326 mg/dL
Reference values have not been established for patients who are younger than 18 years.

Interpretation

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

Normal daily thallium excretion is less than 1 mcg/day.

Exposed patients can have urine thallium excretion 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. doi:10.1001/archneur.1972.00490110090009
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. doi:10.1177/0960327109106487
3. Zhao G, Ding M, Zhang B, et al. Clinical manifestations and management of acute thallium poisoning. Eur Neurol. 2008;60(6):292-297. doi:10.1159/000157883
4. Strathmann FG, Blum LM. Toxic elements. In: Rifai N, Chiu RWK, Young I, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:455.e55
5. Campanella B, Colombaioni L, Benedetti E, et al. Toxicity of thallium at low doses: A review. Int J Environ Res Public Health. 2019;16(23):4732. doi:10.3390/ijerph16234732
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)

Creatinine:
The enzymatic method is based on the determination of sarcosine from creatinine with the aid of creatininase, creatinase, and sarcosine oxidase. The liberated hydrogen peroxide is measured via a modified Trinder reaction using a colorimetric indicator. Optimization of the buffer system and the colorimetric indicator enables the creatinine concentration to be quantified both precisely and specifically.(Package insert: Creatinine plus ver 2. Roche Diagnostics; V15.0, 03/2019)

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
82570

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
TLUCR	Thallium/Creat Ratio, Random, U	13469-2

Result ID	Test Result Name	Result LOINC® Value
CRETR	Creatinine, Random, U	2161-8
615256	Thallium/Creat Ratio, U	13469-2