

## Overview

### Useful For

Detecting mercury toxicity due to occupational exposure

### Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
HGOU	Mercury Occupational Exposure	No	Yes
CRETR	Creatinine, Random, U	No	Yes

### Special Instructions

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

### Method Name

HGOU: Triple-Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS/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 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 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 [Metals Analysis Specimen Collection and Transport](#) for complete instructions.

**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)	7 days	
	Frozen	7 days	

**Clinical & Interpretive****Clinical Information**

The correlation between the levels of mercury (Hg) excretion in the urine and the clinical symptoms is considered poor.

Previous thought indicated urine as a more appropriate marker of inorganic mercury because organic mercury represented only a small fraction of urinary mercury. Based on possible demethylation of methylmercury within the body, urine may represent a mixture of dietary methylmercury and inorganic mercury. Seafood consumption can contribute to urinary mercury levels (up to 30%),<sup>(1)</sup> which is consistent with the suggestion that due to demethylation processes in the human body, a certain proportion of urinary mercury can originate from dietary consumption of fish/seafood.<sup>(2)</sup>

For more information see HG / Mercury, Blood.

**Reference Values**

MERCURY/CREATININE:

Biological Exposure Index (BEI): <35 mcg/g creatinine prior to shift

CREATININE:

> or =18 years: 16-326 mg/dL

Reference values have not been established for patients who are younger than 18 years of age.

**Interpretation**

Daily urine excretion of mercury greater than 50 mcg/day indicates significant exposure (per World Health Organization standard).

**Cautions**

To avoid contamination by dust, specimen should be collected away from the site of suspected exposure.

**Clinical Reference**

1. Snoj Tratniid J, Falnoga I, Mazej D, et al. Results of the first national human biomonitoring in Slovenia: Trace elements in men and lactating women, predictors of exposure and reference values. *Int J Hyg Environ Health.* 2019;222(3):563-582
2. Sherman LS, Blum JD, Franzblau A, Basu N. New insights into biomarkers of human mercury exposure using naturally occurring mercury stable isotopes. *Environ Sci Technol.* 2013;2;47(7):3403-3409
3. Lee R, Middleton D, Caldwell K, et al. A review of events that expose children to elemental mercury in the United States. *Environ Health Perspect.* 2009;117(6):871-878
4. Bjorkman L, Lundekvam BF, Laegreid T, et al. Mercury in human brain, blood, muscle and toenails in relation to exposure: an autopsy study. *Environ Health.* 2007;11;6:30
5. 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

#### Mercury:

The metal of interest is analyzed by triple-quadrupole 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

Monday through Friday

### Report Available

2 to 4 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

83825

82570

### LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HGUOE	Mercury Occupat Exp, Random, U	13465-0

Result ID	Test Result Name	Result LOINC® Value
CRETR	Creatinine, Random, U	2161-8
608893	Mercury Occupational Exposure	13465-0