MAYO CLINIC LABORATORIES

# Test Definition: HGUOE

Mercury Occupational Exposure, Random, Urine

## 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:**
1. For 48 hours before collection, patient **should not** eat seafood.
2. 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%),(1) 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.(2)

For more information see HG / Mercury, Blood.

### Reference Values
MERCURY/CREATININE:
Biological Exposure Index (BEI): <35 mcg/g creatinine prior to shift

CREATININE:
<18 years: Not established
> or =18 years: 16-326 mg/dL

### 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 Tratnik 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 insight into biomarkers of human mercury exposure using naturally occurring mercury stable isotopes. Environ Sci Technol. 2013;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;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:
This enzymatic method is based on the conversion of creatinine with the aid of creatininase, creatinase, and sarcosine oxidase to form glycine, formaldehyde, and hydrogen peroxide. Catalyzed by peroxidase the liberated hydrogen peroxide reacts with 4-aminophenazone and HTIB (2,4,6-triiodo03-hydroxybenzoic acid) to form a quinone imine chromogen. The color intensity of the quinone imine chromogen formed is directly proportional to the creatinine concentration in the reaction mixture.(Package insert: Creatinine plus ver.2. Roche Diagnostics; 07/2024)

### 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

# Test Definition: HGUOE

Mercury Occupational Exposure, Random, Urine

## 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 |