

## Overview

### Useful For

Screening for occupational exposure to chromium

### Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
CROM1	Chromium Occupational Exposure, U	No	Yes
CRETR	Creatinine, Random, U	No	Yes

### Special Instructions

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

### Method Name

CROM1: 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:** Sarstedt Aliquot Tube 5 mL (T914)

**Collection Container/Tube:** Clean, plastic urine collection container with no metal cap or glued insert

**Submission Container/Tube:** Plastic, 5-mL tube or a 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**

2 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	14 days	
	Frozen	28 days	

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

Chromium (Cr) has an atomic mass of 51.996, atomic number 24, and valences ranging from 2(-) to 6(+). Hexavalent chromium, Cr(6+), and trivalent chromium, Cr(3+), are the 2 most prevalent forms. Cr(3+) is the only oxidation state present under normal physiologic conditions. Cr(6+) is widely used in industry to make chromium alloys including stainless steel pigments and electroplated coatings. Cr(6+), a known carcinogen, is rapidly metabolized to Cr(3+). Cr(3+) is the only form present in human urine.

**Reference Values**

0-17 years: Not established

> or =18 years: The American Conference of Governmental Industrial Hygienists (ACGIH) Biological Exposure Index (BEI) for daily occupational exposure to hexavalent chromium in urine is an increase of 10.0 mcg/L between pre-shift and post-shift urine collections. The ACGIH BEI for long- and short-term hexavalent chromium in urine is an end-of-shift concentration above 24.9 mcg/L at the end of the work week.

**Interpretation**

The National Institute for Occupational Safety and Health draft document on occupational exposure reviews the data supporting use of urine to assess chromium exposure.(1) They recommend a Biological Exposure Index of 10 mcg/g creatinine and 30 mcg/g creatinine for the increase in urinary chromium concentrations during a work shift and at the end of shift at the end of the workweek, respectively (Section 3.3.1).

**Cautions**

Normal specimens have extremely low levels of chromium; elevated results could easily be a result of external contamination. Precautions must be taken to ensure the specimen is not contaminated. Metal-free urine collection procedures must be followed. Refrigeration is preferred over chemical methods of preservation.

**Clinical Reference**

1. Centers for Disease Control and Prevention; National Institute for Occupational Safety and Health (NIOSH). Criteria for a recommended standard occupational exposure to hexavalent chromium. CDC; September 2013. Accessed June 5,

2025. Available at [www.cdc.gov/niosh/docs/2013-128/pdfs/2013\\_128.pdf](http://www.cdc.gov/niosh/docs/2013-128/pdfs/2013_128.pdf)

2. Sodi R. Vitamins and trace elements. In: Rifai N, Chiu RWK, Young I, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 39

## Performance

### Method Description

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

### PDF Report

No

### Day(s) Performed

Monday

### Report Available

2 to 8 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

82495

82570

### LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CRUO	Chromium Occupat Exp, Random, U	13464-3

Result ID	Test Result Name	Result LOINC® Value
CRETR	Creatinine, Random, U	2161-8
607761	Chromium Occupational Exposure	13464-3
608390	Chromium Concentration	5623-4