# Test Definition: CDCU

Cadmium/Creatinine Ratio, Urine
(Non-Orderable)

## Overview

### Useful For

**Only orderable as part of a profile**. For more information, see:
CDUCR / Cadmium/Creatinine Ratio, Random, Urine
HMUCR / Heavy Metal/Creatinine Ratio, with Reflex, Random, Urine

Detecting exposure to cadmium using random urine specimens

### Method Name

Only orderable as part of a profile. For more information, see:
CDUCR / Cadmium/Creatinine Ratio, Random, Urine
HMUCR / Heavy Metal/Creatinine Ratio, with Reflex, Random, Urine

Triple-Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS/MS)

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Specimen Required

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HMUCR / Heavy Metal/Creatinine Ratio, with Reflex, Random, Urine

### 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) | 28 days | |

| | | | |
|---|---|---|---|
| | Ambient | 28 days | |
| | Frozen | 28 days | |

## Clinical & Interpretive

### Clinical Information

Cadmium toxicity resembles that of the other heavy metals, including arsenic, mercury, and lead. The kidney is the primary organ affected Kidney dysfunction with proteinuria and slow onset (over a period of years) is the typical presentation. Measurable changes in proximal tubule function, such as decreased clearance of para-aminohippuric acid, also develop over several years and precede overt kidney failure.

Inhalation of cadmium vapor can cause nasal epithelial deterioration and pulmonary congestion resembling chronic emphysema.

For nonsmokers, food is the primary source of cadmium exposure. In general, leafy vegetables such as lettuce and spinach, potatoes, grains, peanuts, soybeans, and sunflower seeds contain high levels of cadmium. For smokers, tobacco smoke is the most common source of exposure is and has been implicated as the primary source of cadmium associated with reproductive toxicity in both men and women.

Chronic cadmium exposure can cause cumulative kidney damage. Cadmium excretion is proportional to creatinine unless kidney damage is present. Cadmium-induced kidney damage may be detected by increased cadmium excretion relative to creatinine.

For Occupational Safety and Health Administration-mandated workplace exposure monitoring (Fed Reg 57:42,102-142,463, September 1992), measurement of urine cadmium and creatinine should be ordered and results reported as mcg of cadmium per gram of creatinine.

### Reference Values

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0-17 years: Not established
> or =18 years: <0.6 mcg/g creatinine

### Interpretation

Cadmium excretion above 3.0 mcg/g creatinine indicates significant exposure to cadmium.

Results above 15 mcg/g creatinine are considered indicative of severe exposure.

### Cautions

Collection of urine specimens through a catheter frequently results in elevated values because rubber contains trace amounts of cadmium that are extracted as urine passes through the catheter.

### Clinical Reference

1. de Burbure C, Buchet JP, Leroyer A, et al. Renal and neurologic effects of cadmium, lead, mercury, and arsenic in children: evidence of early effects and multiple interactions at environmental exposure levels. Environ Health Perspect. 2006;114(4):584-590
2. Schulz C, Angerer J, Ewers U, Heudorf U, Wilhelm M. Human Biomonitoring Commission of the German Federal Environment Agency. Revised and new reference values for environmental pollutants in urine or blood of children in Germany derived from the German Environmental Survey on Children 2003-2006(GerESIV). Int J Hyg Environ Health. 2009;212(6):637-647
3. Occupational Safety and Health Administration. Cadmium exposure and control. Updated 09/02/2008. Accessed August 30, 2024. US Department of Labor Available at osha.gov/SLTC/cadmium/evaluation.html
4. Agency for Toxic Substances and Disease Registry. Toxicological profile for cadmium. US Department of Health and Human Services. September 2012. Available at www.atsdr.cdc.gov/ToxProfiles/tp5.pdf
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
6. Zhang H, Reynolds M. Cadmium exposure in living organisms: A short review. Sci Total Environ. 2019;678:761-767. doi:10.1016/j.scitotenv.2019.04.395

## 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 through Friday

### Report Available

2 to 4 days

### Specimen Retention Time

14 days

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

## Fees & Codes

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## 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

82300

## LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| CDCU | Cadmium/Creatinine Ratio, U | 13471-8 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 608902 | Cadmium/Creatinine Ratio, U | 13471-8 |