

## Overview

### Useful For

Monitoring therapy for kidney stones using 24-hour urine collections

Identifying increased urinary oxalate as a risk factor for stone formation

Diagnosis of primary or secondary hyperoxaluria

### Testing Algorithm

For information see [Hyperoxaluria Diagnostic Algorithm](#).

### Special Instructions

- [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#)
- [Hyperoxaluria Diagnostic Algorithm](#)

### Method Name

Enzymatic

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Necessary Information

**24-hour volume (in milliliters) is required.**

### Specimen Required

**Patient Preparation:** For 24 hours before, as well as during the collection process, patient should not take large doses (>2 g orally/24 hours) of vitamin C.

#### Supplies:

- Diazolidinyl Urea (Germall) 5.0 mL (T822)
- Sarstedt Aliquot Tube, 5mL (T914)

**Container/Tube:** Plastic tube or a clean, plastic aliquot container with no metal cap or glued insert

**Specimen Volume:** 4 mL

#### Collection Instructions:

1. Add 5 mL of diazolidinyl urea (Germall) as a preservative at start of collection or refrigerate specimen during and after collection.

2. Collect urine for 24 hours.
3. Mix container thoroughly and aliquot urine into plastic vial.
4. Specimen pH should be between 4.5 and 8 and will stay in this range if kept refrigerated. Specimens with pH above 8 indicate bacterial contamination, and testing will be canceled. **Do not** attempt to adjust pH, as it will adversely affect results.

**Additional Information:** See [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#) for multiple collections.

## Forms

If not ordering electronically, complete, print, and send a [Renal Diagnostics Test Request](#) (T830) with the specimen.

## Urine Preservative Collection Options

**Note:** The addition of preservative **must occur at the start of collection** or application of temperature controls **must occur during and after** collection.

Ambient (No additive)	No
Refrigerate (No additive)	OK
Frozen (No additive)	No
50% Acetic Acid	No
Boric Acid	No
Diazolidinyl Urea	Preferred
6M Hydrochloric Acid	No
6M Nitric Acid	No
Sodium Carbonate	No
Thymol	No
Toluene	No

## Specimen Minimum Volume

1 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)	14 days	
	Ambient	72 hours	
	Frozen	14 days	

## Clinical & Interpretive

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**Clinical Information**

Oxalate is an end product of glyoxalate and glycerate metabolism. Humans do not have an enzyme capable of degrading oxalate, therefore it must be eliminated by the kidney.

In tubular fluid, oxalate can combine with calcium to form calcium oxalate stones. In addition, high concentrations of oxalate may be toxic to kidney cells.

Increased urinary oxalate excretion results from inherited enzyme deficiencies (primary hyperoxaluria), gastrointestinal disorders associated with fat malabsorption (secondary hyperoxaluria), or increased oral intake of oxalate-rich foods or vitamin C (ascorbic acid).

Since increased urinary oxalate excretion promotes calcium oxalate stone formation, various strategies are employed to lower oxalate excretion.

**Reference Values**

0.11-0.46 mmol/24 h

9.7-40.5 mg/24 h

The reference value is for a 24-hour collection. Specimens collected for other than a 24-hour period are reported in unit of mmol/L for which reference values are not established.

Reference values have not been established for patients who are younger than 16 years.

**Interpretation**

An elevated urine oxalate (>0.46 mmol/24 hours) may suggest disease states such as secondary hyperoxaluria (fat malabsorption), primary hyperoxaluria (alanine glyoxalate transferase enzyme deficiency, glyceric dehydrogenase deficiency), idiopathic hyperoxaluria, or excess dietary oxalate or vitamin C intake.

In stone-forming patients, high urinary oxalate values, sometimes even in the upper limit of the normal range, are treated to reduce the risk of stone formation.

**Cautions**

Ingestion of ascorbic acid (>2 g/24 hours) may falsely elevate the measured urinary oxalate excretion.

**Clinical Reference**

1. Wilson DM, Liedtke RR. Modified enzyme-based colorimetric assay of urinary and plasma oxalate with improved sensitivity and no ascorbate interference: reference values and sample handling procedures. *Clin Chem*. 1991;37(7):1229-1235
2. Lieske JC, Wang X. Heritable traits that contribute to nephrolithiasis. *Urolithiasis*. 2019;47(1):5-10
3. Lieske JC, Turner ST, Edeh SN, Smith JA, Kardia SLR. Heritability of urinary traits that contribute to nephrolithiasis. *Clin J Am Soc Nephrol*. 2014;9(5):943-950
4. Zhao F, Bergstralh EJ, Mehta, RA, et al. Predictors of incident ESRD among patients with primary hyperoxaluria presenting prior to kidney failure. *Clin J Am Soc Nephrol*. 2016;11(1):119-126

**Performance**

**Method Description**

The assay utilizes oxalate oxidase, which oxidizes oxalate to carbon dioxide and peroxide. In the presence of peroxidase, the peroxide oxidatively couples 3-methyl-2-benzothiazolinone and 3-dimethylaminobenzoic acid to form indamine dye, which is measured spectrophotometrically at 600 nm. (Kasidas GP, Rose GA. Continuous-flow assay for urinary oxalate using immobilized oxalate oxidase. Ann Clin Biochem. 1985;22:412-419; package insert: Oxalate kit. Trinity Biotech; V 11/2017)

**PDF Report**

No

**Day(s) Performed**

Monday through Saturday

**Report Available**

3 to 5 days

**Specimen Retention Time**

7 days

**Performing Laboratory Location**

Mayo Clinic Laboratories - Rochester Main Campus

**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 has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

83945

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
OXU	Oxalate, 24 Hr, U	14862-7

Result ID	Test Result Name	Result LOINC® Value
OCATE	Oxalate, 24 Hr, U (mmol/24 hr)	14862-7
OXU1	Oxalate, 24 Hr, U (mg/24 hr)	2701-1

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TM17	Collection Duration	13362-9
VL15	Urine Volume	3167-4