MAYO CLINIC LABORATORIES

Test Definition: OXU

Oxalate, 24 Hour, Urine

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
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

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