MAYO CLINIC LABORATORIES

Test Definition: RURC1

Uric Acid/Creatinine Ratio, Random, Urine

Overview

Useful For

Differentiation of acute uric acid nephropathy from other causes of acute kidney failure

For patients who cannot collect a 24-hour specimen, typically small children, a uric acid to creatinine ratio can be used to approximate 24-hour excretion

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
RTIO1	Uric Acid/Creat Ratio, Random, U	No	Yes
URCO3	Uric Acid, Random, U	No	Yes
CRETR	Creatinine, Random, U	No	Yes

Method Name

URCO3, CRETR: Colorimetric
RTIO1: Calculation

NY State Available

Yes

Specimen

Specimen Type

Urine

Ordering Guidance

X-ray dyes and contrast media will affect test results.
-If a kidney X-ray with dye or computerized tomography (CT) scan with contrast has been performed, patient should wait a minimum of 1 day before starting collection.
-If a cholangiography (bile duct X-ray) has performed, patient should wait 7 days before starting collection.
-Urine must be collected before tablets have been taken for gallbladder X-ray, otherwise patient should wait 7 days before starting collection.

Specimen Required

Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Collection Container/Tube: Plastic urine container
Submission Container/Tube: Plastic, 5-mL tube or a clean, plastic aliquot container with no metal cap or glued insert
Specimen Volume: 4 mL

Collection Instructions:

1. Collect a random urine specimen.
2. No preservative.

Forms

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

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	7 days	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Uric acid is the end-product of purine metabolism. It is freely filtered by the glomeruli and most is reabsorbed by the tubules. There is also active tubular secretion.

Increased levels of uric acid in the urine usually accompany increased plasma uric acid levels unless there is a decreased excretion of uric acid by the kidneys. Urine uric acid levels reflect the amount of dietary purines and endogenous nucleic acid breakdown.

Acute uric acid nephropathy can cause acute renal failure due to uric acid precipitation within tubules. This is most commonly seen in patients with hematologic malignancies (eg, lymphoma, leukemia), often after acute lysis of cells by chemotherapy. Less commonly this may be seen with seizures, treatment of solid tumors, overproduction of uric acid in metabolic disorders such as Lesch-Nyhan syndrome or decreased uric acid reabsorption in the proximal nephron due to tubular disorder (Fanconi syndrome).

Reference Values

> or =18 years: <0.60 mg/mg creatinine
Reference values have not been established for patients who are younger than 18 years.

Interpretation

Uric acid excretion can be either decreased or increased in response to a variety of pharmacologic agents.

Urine uric acid levels are elevated in states of uric acid overproduction such as in leukemia and polycythemia and after

intake of food rich in nucleoproteins.

A uric acid to creatinine ratio (mg/mg) greater than 1.0 is consistent with acute uric acid nephropathy, whereas values less than 0.75 are consistent with other causes of acute renal failure.(1)

A timed 24-hour collection is usually the preferred method for measuring and interpreting this urinary analyte. Random collections normalized to urinary creatinine may be of clinical use in 2 scenarios, however:
-When acute renal failure secondary to uric acid is suspected, a uric acid to creatinine ratio (mg/mg) greater than 1.0 is consistent with acute uric acid nephropathy, whereas values less than 0.75 are consistent with other causes of acute renal failure.(1)
-In patients who cannot collect a 24-hour specimen, typically small children, a uric acid creatinine ratio can be used to approximate 24-hour excretion.

Pediatric Reference Ranges of Uric Acid/Creatinine (mg/mg)(2)		
Age (year)	**5th Percentile**	**95th Percentile**
0-0.5	>1.189	<2.378
0.5-1	>1.040	<2.229
1-2	>0.743	<2.080
2-3	>0.698	<1.932
3-5	>0.594	<1.635
5-7	>0.446	<1.189
7-10	>0.386	<0.832
10-14	>0.297	<0.654
14-17	>0.297	<0.594

Cautions

High levels of bilirubin and ascorbic acid may interfere with measurement.

Clinical Reference

1. Lamb EJ, Jones GRD. Kidney function tests. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:500-503
2. Kelton J, Kelley WN, Holmes EW. A rapid method for the diagnosis of acute uric acid nephropathy. Arch Intern Med. 1978;138(4):612-615
3. Matos V, Van Melle G, Werner D et al. Urinary oxalate and urate to creatinine ratios in a healthy pediatric population. Am J Kidney Dis. 1999; Aug;34(2):e1
4. Newman DJ, Price CP. Renal function and nitrogen metabolites. In: Tietz NW, ed. Textbook of Clinical Chemistry. WB Saunders Company, 1999:1245-1250

Performance

Method Description

Uric acid:
Uricase cleaves uric acid to form allantoin and hydrogen peroxide. In the presence of peroxidase, 4-aminophenazone is

oxidized by hydrogen peroxide to a quinone-diimine dye. The color intensity of the quinone-diimine formed is directly proportional to the uric acid concentration and is determined by measuring the increase in absorbance.(Package insert: Uric Acid reagent. Roche Diagnostics; 11/2023)

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. Roche Diagnostics; 07/2024)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 day

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 cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
84560
82570

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value

Test Definition: RURC1

Uric Acid/Creatinine Ratio, Random, Urine

RURC1	Uric Acid/Creat Ratio, Random, U	3089-0

Result ID	Test Result Name	Result LOINC® Value
CRETR	Creatinine, Random, U	2161-8
RTIO1	Uric Acid/Creat Ratio, Random, U	3089-0
URCO3	Uric Acid, Random, U	3086-6