Overview

Useful For
Calculation of creatinine clearance, a measure of renal function, when used in conjunction with serum creatinine

Special Instructions
- [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#)

Method Name
Enzymatic Colorimetric Assay

NY State Available
Yes

Specimen

Specimen Type
Urine

Necessary Information
24-Hour volume is required.

Specimen Required

Supplies: Aliquot Tube, 5 mL (T465)

Container/Tube: Plastic, 5-mL tube

Specimen Volume: 4 mL

Collection Instructions:
1. Collect urine for 24 hours.
2. Refrigerate specimen within 4 hours of completion of 24-hour collection.

Additional Information:
1. This test does not require the use of a chemical preservative; if a chemical preservative is used, it must be added to the specimen within 4 hours of completion of 24-hour collection.
2. See [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#) in Special Instructions 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 or application of temperature controls must occur within 4 hours of completion of the collection.

<table>
<thead>
<tr>
<th>Preservative</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient</td>
<td>OK</td>
</tr>
<tr>
<td>Refrigerate</td>
<td>Preferred</td>
</tr>
<tr>
<td>Frozen</td>
<td>OK</td>
</tr>
<tr>
<td>50% Acetic Acid</td>
<td>OK</td>
</tr>
<tr>
<td>Boric Acid</td>
<td>OK</td>
</tr>
<tr>
<td>Diazolidinyl Urea</td>
<td>OK</td>
</tr>
<tr>
<td>6M Hydrochloric Acid</td>
<td>OK</td>
</tr>
<tr>
<td>6M Nitric Acid</td>
<td>OK</td>
</tr>
<tr>
<td>Sodium Carbonate</td>
<td>OK</td>
</tr>
<tr>
<td>Thymol</td>
<td>OK</td>
</tr>
<tr>
<td>Toluene</td>
<td>No</td>
</tr>
</tbody>
</table>

Specimen Minimum Volume
1 mL

Reject Due To
All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>Refrigerated (preferred)</td>
<td>30 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>30 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>30 days</td>
<td></td>
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</tbody>
</table>

Clinical and Interpretive

Clinical Information
Creatinine is formed from the metabolism of creatine and phosphocreatine, both of which are principally found in muscle. Thus the amount of creatinine produced is, in large part, dependent upon the individual's muscle mass and tends not to fluctuate much from day-to-day.

Creatinine is not protein bound and is freely filtered by glomeruli. All of the filtered creatinine is excreted in the urine. Renal tubular secretion of creatinine also contributes to a small proportion of excreted creatinine. Although most excreted creatinine is derived from an individual's muscle, dietary protein intake, particularly of cooked meat, can contribute to urinary creatinine levels.

The renal clearance of creatinine provides an estimate of glomerular filtration rate.
Reference Values
Normal values mg per 24 hours:
Males: 955-2936 mg/24 hours
Females: 601-1689 mg/24 hours
Reference ranges for male and female patients <18 and >83 years of age have not been established.
The expected urine creatinine excretion per 24 hours:
Males: 13-29 mg/kg of body weight/24 hours
Females: 9-26 mg/kg of body weight/24 hours
Reference ranges for male and female patients <18 and >83 years of age have not been established.
Note: To convert to mg/kg of body weight/24 hours, divide the mg/24 h result by body weight in kg.
For SI unit Reference Values, see https://www.mayocliniclabs.com/order-tests/si-unit-conversion.html

Interpretation
24-Hour urinary creatinine determinations are principally used for the calculation of creatinine clearance.
Decreased creatinine clearance indicates decreased glomerular filtration rate. This can be due to conditions such as progressive renal disease or result from adverse effects on renal hemodynamics, which are often reversible, including certain drug usage or from decreases in effective renal perfusion (eg, volume depletion or heart failure).
Increased creatinine clearance is often referred to as “hyperfiltration” and is most commonly seen during pregnancy or in patients with diabetes mellitus before diabetic nephropathy has occurred. It also may occur with large dietary protein intake.

Cautions
The reliability of 24-hour urinary creatinine determinations are, as for all timed urine collections, very dependent on accurately collected 24-hour specimens.
Intra-individual variability in creatinine excretion may be due to differences in muscle mass or amount of ingested meat.
Acute changes in glomerular filtration rate (GFR), before a steady state has developed, will alter the amount of urinary creatinine excreted.

Clinical Reference
Performance

Method Description
The enzymatic method is based on the determination of sarcosine from creatinine with the aid of creatininase, creatinase, and sarcosine oxidase. The liberated hydrogen peroxide is measured via a modified Trinder reaction using a colorimetric indicator. Optimization of the buffer system and the colorimetric indicator enables the creatinine concentration to be quantified both precisely and specifically. (Package insert: Roche Diagnostics, Indianapolis IN, 2004)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Sunday; Continuously

Analytic Time
1 day

Maximum Laboratory Time
1 day

Specimen Retention Time
7 days

Performing Laboratory Location
Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification
This test has been cleared, approved or is exempt by the U.S. 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
82570

LOINC® Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<tbody>
<tr>
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<td>Creatinine, U</td>
<td>65634-8</td>
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<tr>
<td>Result ID</td>
<td>Test Result Name</td>
<td>Result LOINC Value</td>
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<td>------------------------------</td>
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<td>CRE_A</td>
<td>Creatinine, U</td>
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<td>TM10</td>
<td>Collection Duration</td>
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<td>VL8</td>
<td>Urine Volume</td>
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