Overview

Useful For
Assessment of renal tubular injury or dysfunction
Screening for tubular abnormalities
Detecting chronic asymptomatic renal tubular dysfunction

Profile Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTUR</td>
<td>Creatinine Conc</td>
<td>Yes, (order CTU)</td>
<td>Yes</td>
</tr>
<tr>
<td>AIMR</td>
<td>Alpha-1-Microglobulin, Random, U</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Method Name
CTUR: Enzymatic Colorimetric Assay
AIMR: Immunonephelometry

NY State Available
Yes

Specimen

Specimen Type
Urine

Specimen Required
Container/Tube: Plastic, 5-mL tube (T465)

Specimen Volume: 5 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

<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>7 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>7 days</td>
<td></td>
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</tbody>
</table>

Clinical and Interpretive

Clinical Information
Alpha-1-microglobulin is a low-molecular-weight protein of 26 kDa and a member of the lipocalin protein superfamily. It is synthesized in the liver, freely filtered by glomeruli, and reabsorbed by renal proximal tubules cells where it is catabolized. Due to extensive tubular reabsorption, under normal conditions very little filtered alpha-1-microglobulin appears in the final excreted urine. Therefore, an increase in the urinary concentration of alpha-1-microglobulin indicates proximal tubule injury and/or impaired proximal tubular function.

Elevated excretion rates can indicate tubular damage associated with renal tubulointerstitial nephritis or tubular toxicity from heavy metal or nephrotoxic drug exposure. Glomerulonephropathies and renal vasculopathies also are often associated with coexisting tubular injury and so may result in elevated urinary alpha-1-microglobulin excretion. Elevated alpha-1-microglobulin in patients with urinary tract infections may indicate renal involvement (pyelonephritis). Measurement of urinary excretion of retinol-binding protein, another low-molecular-weight protein, is an alternative to the measurement of alpha-1-microglobulin. To date, there are no convincing studies to indicate that 1 test has better clinical utility than the other.

Urinary excretion of alpha-1-microglobulin can be determined from either a 24-hour collection or from a random urine collection. The 24-hour collection is traditionally considered the gold standard. For random or spot collections, the concentration of alpha-1-microglobulin is divided by the urinary creatinine concentration. This corrected value adjusts alpha-1-microglobulin for variabilities in urine concentration.

Reference Values
<50 years: <13 mg/g creatinine
> or =50 years: <20 mg/g creatinine

Interpretation
Alpha-1-microglobulin above the reference values may indicate a proximal tubular dysfunction. As suggested in the literature, 7 mg/g creatinine is an upper reference limit for pediatric patients of 1 month to 15 years of age.

Cautions
Since this is a nephelometric assay, turbidity and particles (eg, cells, crystals) in the sample can interfere with the test. Therefore, all urine specimens should be centrifuged at ambient temperature prior to assay.

Clinical Reference
Test Definition: RA1M
Alpha-1-Microglobulin, Random, U


Performance

Method Description
Creatinine is performed by the enzymatic method, which is based on the determination of sarcosine from creatinine with the aid of creatinase, 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)

In an immunochemical reaction, alpha-1-microglobulin present in the urine sample forms immune complexes with anti-alpha-1-microglobulin-specific antibodies. These complexes scatter a beam of light passed through the sample. The intensity of the scattered light is proportional to the concentration of alpha-1-microglobulin in the sample. The result is evaluated by comparison with a standard of known concentration. (Package insert: Dade Behring N Antisera to Human Alpha-1-microglobulin)

PDF Report
No

Day(s) and Time(s) Test Performed
Varies; 8 a.m.-4 p.m.

Analytic Time
1 day

Maximum Laboratory Time
7 days

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 or approved 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**

83883

**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>
<td>RA1M</td>
<td>Alpha-1-Microglobulin, Random, U</td>
<td>48415-4</td>
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</table>

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Test Result Name</th>
<th>Result LOINC Value</th>
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<tbody>
<tr>
<td>CTUR</td>
<td>Creatinine Conc</td>
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<tr>
<td>A1M_U</td>
<td>Alpha-1-Microglobulin, Random, U</td>
<td>46723-3</td>
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<tr>
<td>A1M_R</td>
<td>A1M/Creat Ratio</td>
<td>48415-4</td>
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</tbody>
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