Overview

Useful For
Assessing the nutrition intake of animal protein

The calculation of urinary supersaturation of various crystals or stones

Special Instructions
- Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens

Method Name
High-Pressure Ion Chromatography (HPIC)

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 urine tube

Specimen Volume: 4 mL

Collection Instructions:
Collect urine for 24 hours.

2. No preservative.

3. Specimen must be kept refrigerated during and after collection.

4. Specimen pH should be between 4.5 and 8 and will stay in this range if kept refrigerated. Specimens with pH >8
indicate bacterial contamination, and testing will be cancelled. 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](#) 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>Ambient</th>
<th>Refrigerate</th>
<th>Frozen</th>
<th>50% Acetic Acid</th>
<th>Boric Acid</th>
<th>Diazolidinyl Urea</th>
<th>6M Hydrochloric Acid</th>
<th>6M Nitric Acid</th>
<th>Sodium Carbonate</th>
<th>Thymol</th>
<th>Toluene</th>
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<tbody>
<tr>
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**Reject Due To**
All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

**Specimen Minimum Volume**
1 mL

**Specimen Stability Information**

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Urine</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
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**Clinical & Interpretive**
Clinical Information
Urinary sulfate is a reflection of dietary protein intake, particularly meat, fish, and poultry, which are rich in sulfur-containing amino acids methionine and cysteine. Urinary sulfate can be used to assess dietary protein intake for nutritional purposes. A protein-rich diet has been associated with an increased risk for stone formation, possibly due, in part, to an increase in urinary calcium excretion caused by acid production from metabolism of sulfur-containing amino acids.(1,2) Indeed, urinary sulfate excretion is higher in patients who have kidney stones than in individuals who do not form stones. Thus, urinary sulfate excretion may provide an index for protein-induced calciuria.(1)

Sulfate is a major anion in the urine that has significant affinity for cations and modulates the availability of cations for reacting with other anions in the urine. It thus is an important factor of urinary supersaturation(3) for various crystals or stones such as calcium oxalate, hydroxyapatite, and brushite. For example, a high sulfate concentration may modulate the availability of calcium for reacting with oxalate and thus affect the propensity for calcium oxalate stone or crystal formation. Urinary sulfate also has a major impact on buffering or providing hydrogen ions and as such modulates the supersaturation of uric acid.

Reference Values
7-47 mmol/24 hours

Interpretation
Urinary sulfate is a reflection of dietary protein intake, particularly of meat, and thus can be used as an index of nutritional protein intake.

It also is used in the calculation of urinary supersaturation of various crystals or stones.

Cautions
No significant cautionary statements

Clinical Reference


Performance

Method Description
A high-pressure ion chromatography system (HPICS) utilizes an anion exchange column to separate sulfate from other anions present in urine. Detection of sulfate is done by conductivity change as eluent flows through a conductivity cell of a conductivity detector. The Thermo IC system is operated through a PC computer using thermo Chromeleon 7 software. (Christison T, Lopez L: Determination of Inorganic Anions in Acid Rain Using a Dedicated High-Pressure Capillary Ion Chromatography System. Technical Note 124 Thermo Scientific, 2016)

PDF Report
No

Specimen Retention Time
7 days

Performing Laboratory Location
Rochester

Fees & Codes

Test Classification
This test was developed, and its performance characteristics 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
84392

LOINC® Information

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<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<td>Sulfate, 24 Hr, U</td>
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