Overview

Useful For
Assessing renal reabsorption of phosphorus in a variety of pathological conditions associated with hypophosphatemia including hypophosphatemic rickets, tumor-induced osteomalacia, and tumoral calcinosis.

Adjusting phosphate replacement therapy in severe deficiency states monitoring the renal tubular recovery from acquired Fanconi syndrome.

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>RTRP</td>
<td>Tubular Phosp Reabsorption, Random</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>CTUR</td>
<td>Creatinine Conc</td>
<td>Yes, (Order RCTUR)</td>
<td>Yes</td>
</tr>
<tr>
<td>PHOS</td>
<td>Phosphorus (Inorganic), S</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ACREA</td>
<td>Creatinine, S</td>
<td>Yes, (Order CRTS1)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Method Name
RTRP: Calculation
CTUR, ACREA: Enzymatic Colorimetric Assay
PHOS: Photometric, Ammonium Molybdate

NY State Available
Yes

Specimen

Specimen Type
Serum
Urine

Specimen Required
Both serum and urine are required.

Patient Preparation: Fasting

Specimen Type: Serum

Collection Container/Tube: Red top or serum gel

Submission Container/Tube: Plastic vial
**Specimen Volume:** 0.5 mL

**Collection Instructions:** Label specimen as serum.

**Specimen Type:** Urine

**Container/Tube:** Plastic, 6-mL tube

**Specimen Volume:** 4 mL

**Collection Instructions:**
1. Collect a random urine specimen.
2. No preservative.
3. Label specimen as urine.

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

**Specimen Minimum Volume**
- Urine: 1 mL
- Serum: 0.625 mL

**Reject Due To**
- Gross hemolysis: Reject

**Specimen Stability Information**

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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</thead>
<tbody>
<tr>
<td>Serum</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Refrigerated</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Urine</td>
<td>Refrigerated (preferred)</td>
<td>14 days</td>
<td></td>
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<tr>
<td></td>
<td>Frozen</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
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**Clinical and Interpretive**

**Clinical Information**
The tubular reabsorption of phosphate (TRP) is the fraction (or percent) of filtered phosphorus that is reabsorbed by renal tubules. Its measurement is useful when evaluating patients with hypophosphatemia. In general, a reduced TRP in the presence of hypophosphatemia is indicative of a renal defect in phosphate reabsorption.

The ratio of the maximum rate of tubular phosphate reabsorption to the glomerular filtration rate (TmP/GFR) is considered the most convenient way to evaluate renal phosphate transport and is referred to as the theoretical renal phosphate threshold. This corresponds to the theoretic lower limit of plasma phosphate below which all filtered...
phosphate would be reabsorbed. Although direct measurements of parathyroid hormone (PTH), which increases renal phosphate excretion have replaced much of the utility of TmP/GFR measurements, it may still be useful in assessing renal reabsorption of phosphorus in a variety of pathological conditions associated with hypophosphatemia.

**Reference Values**

**TUBULAR REABSORPTION OF PHOSPHORUS**

>80%

(Although, tubular reabsorption of phosphorus levels must be interpreted in light of the prevailing plasma phosphorus and glomerular filtration rate.)

**TUBULAR MAXIMUM PHOSPHORUS REABSORPTION/GLOMERULAR FILTRATION RATE (TmP/GFR)**

2.6-4.4 mg/dL (0.80-1.35 mmol/L)

**PHOSPHORUS (INORGANIC)**

**Males**

1-4 years: 4.3-5.4 mg/dL  
5-13 years: 3.7-5.4 mg/dL  
14-15 years: 3.5-5.3 mg/dL  
16-17 years: 3.1-4.7 mg/dL  
> or =18 years: 2.5-4.5 mg/dL

Reference values have not been established for patients that are <12 months of age.

**Females**

1-7 years: 4.3-5.4 mg/dL  
8-13 years: 4.0-5.2 mg/dL  
14-15 years: 3.5-4.9 mg/dL  
16-17 years: 3.1-4.7 mg/dL  
> or =18 years: 2.5-4.5 mg/dL

Reference values have not been established for patients that are <12 months of age.

**PHOSPHORUS, Random Urine**

No established reference values

**CREATININE Serum**
Test Definition: RTRP1
Tubular Phosp Reabsorption, Random

Males(1)
0-11 months: 0.17-0.42 mg/dL
1-5 years: 0.19-0.49 mg/dL
6-10 years: 0.26-0.61 mg/dL
11-14 years: 0.35-0.86 mg/dL
> or =15 years: 0.74-1.35 mg/dL

Females(1)
0-11 months: 0.17-0.42 mg/dL
1-5 years: 0.19-0.49 mg/dL
6-10 years: 0.26-0.61 mg/dL
11-15 years: 0.35-0.86 mg/dL
> or =16 years: 0.59-1.04 mg/dL

CREATININE, Random Urine
No established reference values

Interpretation
Interpretation of tubular reabsorption of phosphate (TRP) and TmP/GFR is dependent upon the clinical situation and should be interpreted in conjunction with the serum phosphorous concentration.

TmP/glomerular filtration rate (GFR) is independent of dietary phosphorus intake, tissue release of phosphorus, and GFR.

Cautions
No significant cautionary statements

Clinical Reference
Performance

Method Description
Creatinine is performed by the enzymatic method, which 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)

In the phosphorus assay, inorganic phosphorus reacts with ammonium molybdate in an acidic solution to form ammonium phosphomolybdate, which is quantified in the ultraviolet range (340nm). (Package insert: Roche Phosphorus, Roche Diagnostic Corp, Indianapolis, IN, 1999)

PDF Report
No

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

Analytic Time
Same day/1 day

Specimen Retention Time
See Individual Test IDs

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
82565-Creatinine Serum
84100-Phosphorus inorganic (phosphate), serum
84105-Phosphorus inorganic (phosphate), urine

LOINC® Information
### Test Definition: RTRP1
Tubular Phosp Reabsorption, Random

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<tr>
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<th>Order LOINC Value</th>
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<td>RTRP1</td>
<td>Tubular Phosp Reabsorption, Random</td>
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<tr>
<td>PHOS</td>
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