

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

Test ID	Reporting Name	Available Separately	Always Performed
RTRP	Tubular Phosp Reabsorption, Random	No	Yes
CTUR	Creatinine Conc	Yes, (Order RCTUR)	Yes
PHOS	Phosphorus (Inorganic), S	Yes	Yes
ACREA	Creatinine, S	Yes, (Order CRTS1)	Yes

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
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Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Frozen (preferred)	7 days	
	Refrigerated	7 days	
Urine	Refrigerated (preferred)	14 days	
	Frozen	14 days	
	Ambient	7 days	

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

Males(1)

0-11 months: 0.17-0.42 mg/dL

1-5 years: 0.19-0.49 mg/dL

6-10years: 0.26-0.61 mg/dL

11-14years: 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

6-10years: 0.26-0.61 mg/dL

11-15years: 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/GMR 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

1. Kulasingam V, Jung BP, Blaustig IM, et al: Pediatric reference intervals for 28 chemistries and immunoassays on the Roche cobas 6000 analyzer--a CALIPER pilot study. Clin Biochem 2010;43:1045-1050
2. Suki WN, Lederer ED, Rouse D: Renal transport of calcium, magnesium, and phosphate. In The Kidney, Sixth Edition. Edited by B Brenner. WB Saunders Company, 2000, Chapter 12
3. Bijvoet OL: Relation of plasma phosphate concentration to renal tubular reabsorption of phosphate. Clin Sci 1969;37:23-36
4. Walton RJ, Bijvoet OL: Nomogram for derivation of renal threshold phosphate Concentration. Lancet 1975;2:309-310
5. Payne RB: Renal tubular reabsorption of phosphate (TmP/GFR): indications and interpretation. Ann Clin Biochem

1998;35:201-206

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 ID	Test Order Name	Order LOINC Value
RTRP1	Tubular Phosp Reabsorption, Random	In Process

Result ID	Test Result Name	Result LOINC Value
CTUR	Creatinine Conc	2161-8
PHOS	Phosphorus (Inorganic), S	2777-1
TRA	TRP	50057-9
ACREA	Creatinine, S	2160-0
GFRR	Random TmP/GFR	In Process