MAYO CLINIC LABORATORIES

Test Definition: ORTHP

Orthostatic Proteinuria, Random, Urine

Overview

Useful For

Diagnosis of orthostatic proteinuria

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
PRCON	Protein, Total, Random, U	No	Yes
RATO2	Protein/Creatinine Ratio	No	Yes
CRETR	Creatinine, Random, U	No	Yes

Method Name

PRCON: Turbidimetry
CRETR: Colorimetric
RATO2: Calculation

NY State Available

Yes

Specimen

Specimen Type

Urine

Specimen Required

Patient Preparation: Specimens should be collected before fluorescein is given or not collected until at least 24 hour later.
Container/Tube: Plastic, 5-mL tube
Specimen Volume: 4 mL
Collection Instructions:
1. This is a nighttime (supine) collection.
2. Void immediately prior to lying down to sleep.
3. Collect an 8-hour (nighttime) urine specimen.
4. Upon awaking in the morning, the patient should immediately void into the specimen cup.
4. No preservative.
5. Invert well before taking 4-mL (maximum) aliquot.

Specimen Minimum Volume

1 mL

Reject Due To

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

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	14 days	
	Ambient	24 hours	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Orthostatic proteinuria refers to the development of increased proteinuria that develops only when the person is upright and resolves when recumbent or supine. This condition is usually seen in children, adolescents, or young adults, and accounts for the majority of cases of proteinuria in childhood.

Orthostatic proteinuria usually does not indicate significant underlying renal pathology, and is usually not associated with other urine abnormalities such as hypoalbuminemia, hematuria, red blood cell casts, fatty casts, etc. Orthostatic proteinuria typically resolves over time.

This test evaluates for this condition by demonstrating either significant proteinuria, even while supine, or normal protein excretion. Significant proteinuria, even while supine, suggests that the patient does not have orthostatic proteinuria while normal protein excretion supports the diagnosis. This test is typically done on three consecutive mornings to provide more robust support for the diagnosis.

Reference Values

PROTEIN/CREATININE RATIO:
> or =18 years: <0.18 mg/mg creatinine

CREATININE:
> or =18 years = 16-326 mg/dL
Reference values have not been established for patients younger than 18 years of age.

Interpretation

First-morning urine protein-to-creatinine ratio below 0.20 mg/mg creatinine supports the diagnosis of orthostatic proteinuria, while a result above 0.20 mg/mg creatinine does not support this diagnosis.

Further investigation into other etiologies for proteinuria may be warranted.

Cautions

False proteinuria may be due to contamination of urine with menstrual blood, prostatic secretions, or semen.

The urinary protein concentration may rise to 300 mg/24 hours in healthy individuals after vigorous exercise.

Normal newborn infants may have higher excretion of protein in urine during the first 3 days of life.

The presence of hemoglobin elevates protein concentration.

Protein electrophoresis and immunofixation may be required to characterize and interpret the proteinuria.

Clinical Reference

1. Brunzel N: Chemical examination of urine. In: Fundamentals of Urine and Body Fluids. 4th ed. Saunders; 2018:92-94
2. Wilson DM, Anderson RL: Protein-osmolality ratio for the quantitative assessment of proteinuria from a random urinalysis sample. Am J Clin Pathol. 1993 Oct;100(4):419-424
3. Morgenstern BZ, Butani L, Wollan P, Wilson DM, Larson TS: Validity of protein-osmolality versus protein-creatinine ratios in the estimation of quantitative proteinuria from random samples of urine in children. Am J Kidney Dis. 2003 Apr;41(4):760-766
4. Rinehart BK, Terrone DA, Larmon JE, Perry KG Jr, Martin RW, Martin JN Jr: A 12-hour urine collection accurately assesses proteinuria in hospitalized hypertensive gravida. J Perinatol. 1999 Dec;19(8 Pt 1):556-558
5. Adelberg AM, Miller J, Doerzbacher M, Lambers DS: Correlation of quantitative protein measurements in 8-, 12-, and 24-hour urine samples for diagnosis of preeclampsia. Am J Obstet Gynecol. 2001 Oct;185(4):804-807
6. Robinson RR: Isolated proteinuria in asymptomatic patients. Kidney Int. 1980 Sep;18(3):395-406
7. Dube J, Girouard J, Leclerc P, Douville P: Problems with the estimation of urine protein by automated assays. Clin Biochem. 2005 May;(38):479-485
8. Koumantakis G, Wyndham L: Fluorescein interference with urinary creatinine and protein measurements. Clin Chem. 1991 Oct;37(10 Pt 1):1799
9. Lamb EJ, Jones GRD: Kidney function tests. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:479-517

Performance

Method Description

Protein:
The sample is preincubated in an alkaline solution containing EDTA, which denatures the protein and eliminates interference from magnesium ions. Benzethonium chloride is then added, producing turbidity.(Package insert: Total Protein Urine/CSF. Roche Diagnostics; 05/2024)

Creatinine:
This enzymatic method is based on the conversion of creatinine with the aid of creatininase, creatinase, and sarcosine oxidase to form glycine, formaldehyde, and hydrogen peroxide. Catalyzed by peroxidase the liberated hydrogen peroxide reacts with 4-aminophenazone and HTIB (2,4,6-triiodo03-hydroxybenzoic acid) to form a quinone imine chromogen. The color intensity of the quinone imine chromogen formed is directly proportional to the creatinine concentration in the reaction mixture.(Package insert: Creatinine plus ver.2. Roche Diagnostics; 07/2024)

The final result uses a calculation to provide the total protein per creatinine ratio. This calculation is performed by the laboratory information system, SCC Soft.

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 day

Specimen Retention Time
7 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & 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 account representative. For assistance, contact Customer Service.

Test Classification
This test has been cleared, approved, or is exempt by the US 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
CRETR- 82570
PRCON- 84156

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
ORTHP	Orthostatic Proteinuria, Random, U	87434-7

Result ID	Test Result Name	Result LOINC® Value
CRETR	Creatinine, Random, U	2161-8
PRCON	Protein, Total, Random, U	2888-6
RATO2	Protein/Creatinine Ratio	2890-2