MAYO CLINIC LABORATORIES

Test Definition: PTU

Protein, Total, 24 Hour, Urine

Overview

Useful For

Evaluation of kidney disease using a 24-hour urine collection

Screening for monoclonal gammopathy

Special Instructions

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

Method Name

Turbidimetry

NY State Available

Yes

Specimen

Specimen Type

Urine

Necessary Information

24-Hour volume (in milliliters) is required.

Specimen Required

Supplies: Sarstedt 5 mL Aliquot Tube (T914)
Collection Container/Tube: 24-hour graduated urine container with no metal cap or glued insert
Submission Container/Tube: Plastic, 5 mL tube or a clean, plastic aliquot container with no metal cap or glued insert
Specimen Volume: 4 mL
Collection Instructions:
1. Collect urine for 24 hours. Specimens should be collected before fluorescein is given or not collected until at least 24 hour later.
2. No preservative.
3. Invert well before taking 4-mL aliquot.
4. Do not over fill aliquot tube 4 mL at most.
Additional Information: See Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens for multiple collections.

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Kidney Transplant Test Request

-Renal Diagnostics Test Request (T830)

Urine Preservative Collection Options

Note: The addition of preservative or application of temperature controls **must occur within 4 hours of completion** of the collection.

Ambient (no additive)	No
Refrigerate (no additive)	Preferred
Frozen (no additive)	OK
50% Acetic Acid	No
Boric Acid	OK
Diazolidinyl Urea	OK
6M Hydrochloric Acid	No
6M Nitric Acid	No
Sodium Carbonate	No
Toluene	No

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

Protein in urine is normally composed of a combination of plasma-derived proteins that have been filtered by glomeruli and have not been reabsorbed by the proximal tubules and proteins secreted by renal tubules or other accessory glands.

Increased amounts of protein in the urine may be due to:
-Glomerular proteinuria: caused by defects in permselectivity of the glomerular filtration barrier to plasma proteins (eg, glomerulonephritis or nephrotic syndrome)
-Tubular proteinuria: caused by incomplete tubular reabsorption of proteins (eg, interstitial nephritis)
-Overflow proteinuria: caused by increased plasma concentration of proteins (eg, multiple myeloma, myoglobinuria)
-Urinary tract inflammation or tumor

Reference Values

> or =18 years: <229 mg/24 hours
Reference values have not been established for patients <18 years of age.
Reference value applies to 24-hour collection.

Interpretation

Total protein greater than 500 mg/24 hours should be evaluated by immunofixation to determine if a monoclonal immunoglobulin light chain is present, and if so, identify it as either kappa or lambda type.

Urinary protein levels may rise to 300 mg/24 hours in healthy individuals after vigorous exercise.

Low-grade proteinuria may be seen in inflammatory or neoplastic processes involving the urinary tract.

Cautions

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

After vigorous exercise, the urinary protein concentration may rise to 300 mg/24 hours in healthy individuals.

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.

Clinical Reference

1. Delaney MP, Lamb EJ: Kidney disease. In: Rifai N, Horvath AR, Wittwer CT, eds. Textbook of Clinical Chemistry, 6th ed. Elsevier; 2018:1256-1323
2. Rinehart BK, Terrone DA, Larmon JE, et al: A 12-hour urine collection accurately assesses proteinuria in hospitalized hypertensive gravida. J Perinatol. 1999;19:556-558
3. 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
4. Robinson RR: Isolated proteinuria in asymptomatic patients. Kidney Int. 1980;18:395-406
5. Dube J, Girouard J, Leclerc P, et al: Problems with the estimation of urine protein by automated assays. Clin Biochem. 2005;38(5):479-485
6. Koumantakis G, Wyndham, L: Fluorescein Interference with Urinary Creatinine and Protein Measurements. Clin Chem. 1991;37(10):1799

Performance

Method Description

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)

PDF Report

No

Test Definition: PTU

Protein, Total, 24 Hour, Urine

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
84156

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PTU	Protein, Total, 24 HR, U	2889-4

Result ID	Test Result Name	Result LOINC® Value
TP2	Total Protein, 24 HR, U	2889-4
TM23	Collection Duration	13362-9
VL21	Urine Volume	19153-6
CONC1	Total Protein Concentration	21482-5