

Overview

Useful For

Assessing renal tubular injury or dysfunction

Screening for other tubular abnormalities

Detecting chronic asymptomatic renal tubular dysfunction(2)

Special Instructions

- [Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens](#)

Method Name

Immunonephelometry

NY State Available

Yes

Specimen

Specimen Type

Urine

Necessary Information

24-Hour volume is required.

Specimen Required

Container/Tube: Plastic, 5-mL tube (T465)

Specimen Volume: 5 mL

Collection Instructions:

1. Collect urine for 24 hours.
2. No preservative.
3. Mix well before taking 5-mL aliquot.

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.

Ambient	Preferred
Refrigerate	OK
Frozen	OK
50% Acetic Acid	No
Boric Acid	OK
Diazolidinyl Urea	No
6M Hydrochloric Acid	No
6M Nitric Acid	No
Sodium Carbonate	No
Thymol	OK
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)	7 days	
	Frozen	7 days	

Clinical and Interpretive

Clinical Information

Retinol-binding protein is a low-molecular-weight protein of 21 kDa that transports retinol (vitamin A alcohol) from the liver to peripheral tissues.⁽¹⁾ Retinol-binding protein is most often found bound to transthyretin, but a small, unbound fraction (<10%) passes freely through glomerular membranes and is reabsorbed by renal proximal tubules cells where it is catabolized. Due to extensive tubular reabsorption, under normal conditions very little of the filtered retinol-binding protein appears in the final excreted urine. Therefore, an increase in the urinary excretion of retinol-binding protein indicates proximal tubule injury and/or impaired proximal tubular function.⁽¹⁾ Measurement of retinol-binding protein in urine is, therefore, a useful aid in the monitoring and/or diagnosis of kidney disease.

Elevated excretion rates can indicate tubular damage associated with renal tubulointerstitial nephritis or tubular toxicity from heavy metal or nephrotoxic drug exposure. Glomerulonephropathies and renal vasculopathies also are often associated with coexisting tubular injury and so may result in elevated retinol-binding protein excretion. Measurement of urinary excretion of alpha-1-microglobulin, another low-molecular-weight protein, is an alternative to the measurement of retinol-binding protein. To date, there are no convincing studies to indicate that one test has

better clinical utility than the other.

Urinary excretion of retinol-binding protein can be determined from either a 24-hour collection or from a random urine collection. The 24-hour collection is traditionally considered the gold standard. For random or spot collections, the concentration of retinol-binding protein is divided by the urinary creatinine concentration. This corrected value adjusts retinol-binding protein for variabilities in urine concentration.

Reference Values

<163 mcg/24 hours

Interpretation

Retinol-binding protein above the reference values may be indicative of a proximal tubular dysfunction.

Cautions

Since this is a nephelometric assay, turbidity and particles (eg, cells, crystals) in the specimen can interfere with the test. Therefore, all urine specimens should be centrifuged at ambient temperature prior to assay.

Clinical Reference

1. Kirsztajn GM, Nishida SK, Silva MS, et al: Urinary retinol-binding protein as a prognostic marker in glomerulopathies. *Nephron* 2002 Apr;90(4):424-431
2. Norden AG, Scheinman SJ, Deschodt-Lanckman MM, et al: Tubular proteinuria defined by a study of Dent's (CLCN5 mutation) and other tubular diseases. *Kidney Int* 2000 Jan;57(1):240-249

Performance

Method Description

In an immunochemical reaction, urinary retinol-binding protein forms immune complexes with anti-retinol-binding protein-specific antibodies coated onto polystyrene latex particles. The resulting latex bead-antigen-antibody complexes have enhanced light-scattering ability, which is detected with a nephelometer when a beam of light is passed through the sample. The intensity of the scattered light is proportional to the concentration of retinol-binding protein in the sample. The result is evaluated by comparison with a standard of known retinol-binding protein concentration. (Package insert: Binding Site Human Urine Retinol Binding Protein Nephelometric Kit for use on the Dade-Behring BNII Analyzer)

PDF Report

No

Day(s) and Time(s) Test Performed

Varies; 8 a.m. to 4 p.m.

Analytic Time

7 days

Maximum Laboratory Time

8 days

Specimen Retention Time

7 days after testing

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 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 U.S. Food and Drug Administration.

CPT Code Information

83883

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
RBP24	Retinol-Binding Protein, 24-Hour, U	In Process

Result ID	Test Result Name	Result LOINC Value
RBP1	Retinol-Binding Protein, 24-Hour, U	18362-4
RBPC1	RBP/Creat Ratio	In Process
DUR6	Collection Duration	13362-9
VL59	Urine Volume	3167-4
RBPCN	Retinol-Binding Protein Conc	33782-4
CRCN	Creatinine Concentration	20624-3