

Overview

Useful For

Identifying monoclonal gammopathies using random urine specimens

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
RPEU	Protein Electrophoresis, Random, U	No	Yes
PTCON	Protein, Total, Random, U	No	Yes

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
RIFXU	Immunofixation, Random, U	No	No

Testing Algorithm

Urine protein electrophoresis alone is not considered an adequate screening for monoclonal gammopathies. If a discrete electrophoresis band is identified, the laboratory will evaluate the urine protein electrophoresis and, if necessary, perform immunofixation at an additional charge.

The following algorithms are available:

[-Amyloidosis: Laboratory Approach to Diagnosis](#)

[-Multiple Myeloma: Laboratory Screening](#)

Special Instructions

- [Amyloidosis: Laboratory Approach to Diagnosis](#)
- [Multiple Myeloma: Laboratory Screening](#)

Method Name

PTCON: Turbidimetry

RPEU: Agarose Gel Electrophoresis

RIFXU: Immunofixation

NY State Available

Yes

Specimen

Specimen Type

Urine

Ordering Guidance

Random urine specimens may be sufficient for identifying monoclonal proteins, but 24-hour specimens should be used to quantitate and monitor urinary abnormalities. See MPSU / Monoclonal Protein Study, 24 Hour, Urine.

Shipping Instructions

Refrigerate specimen after collection and send refrigerated.

Specimen Required**Supplies:**

-Urine Container, 60 mL (T313)

-Sarstedt 5 mL Aliquot Tube (T914)

Submission Container/Tube: Plastic, 60-mL urine bottle and plastic, 5-mL tube

Specimen Volume: 50 mL

Collection Instructions:

1. Collect random urine specimen.
2. Aliquot at least 25-mL specimen in plastic, 60-mL urine bottle and at least 1-mL of specimen in plastic, 5-mL tube.
3. Label specimens appropriately (60-mL bottle for protein electrophoresis and 5-mL tube for protein, total).

Specimen Minimum Volume

25 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	
	Frozen	5 days	
	Ambient	24 hours	

Clinical & Interpretive**Clinical Information**

Urine proteins can be grouped into 5 fractions by protein electrophoresis:

-Albumin

-Alpha-1-globulin

-Alpha-2-globulin

-Beta-globulin

-Gamma-globulin

The urine total protein concentration, the electrophoretic pattern, and the presence of a monoclonal immunoglobulin light chain may be characteristic of monoclonal gammopathies such as multiple myeloma, primary systemic amyloidosis, and light-chain deposition disease.

The following algorithms are available:

[-Amyloidosis: Laboratory Approach to Diagnosis](#)

[-Multiple Myeloma: Laboratory Screening](#)

Reference Values

PROTEIN, TOTAL

No reference values apply to random urine.

ELECTROPHORESIS, PROTEIN

The following fractions, if present, will be reported as mg/dL:

-Albumin

-Alpha-1-globulin

-Alpha-2-globulin

-Beta-globulin

-Gamma-globulin

No reference values apply to random urines.

Interpretation

A characteristic monoclonal band (M-spike) is often found in the urine of patients with monoclonal gammopathies. The initial identification of an M-spike or an area of restricted migration should be followed by immunofixation to identify the immunoglobulin heavy chains and light chains.

Immunoglobulin heavy chain fragments as well as free light chains may be seen in the urine of patients with monoclonal gammopathies.

The presence of a monoclonal light chain M-spike of greater than 1 g/24 hours is consistent with a diagnosis of multiple myeloma or macroglobulinemia.

The presence of a small amount of monoclonal light chain and proteinuria (total protein >3 g/24 hours) that is predominantly albumin is consistent with primary systemic amyloidosis (AL) and light-chain deposition disease (LCDD).

Because patients with AL and LCDD may have elevated urinary protein without an identifiable M-spike, urine protein electrophoresis is not considered an adequate screen for these disorders and immunofixation is also recommended.

Cautions

Patients suspected of having a monoclonal gammopathy may have a normal urine protein electrophoretic pattern, and these patients should have immunofixation performed.

Monoclonal gammopathies are rarely seen in patients younger than 30 years of age.

Hemolysis may cause a discrete band on protein electrophoresis, which will be negative on immunofixation.

Penicillin may split the albumin band.

Radiographic agents may produce an uninterpretable pattern.

Clinical Reference

1. Abraham RS, Barnidge DR: Protein analysis in the clinical immunology laboratory. In: Detrick B, Hamilton RG, Schmitz JL, eds. Molecular and Clinical Laboratory Immunology. 8th ed Wiley; 2016:chap 4
2. Keren DF, Humphrey RL: Clinical indications and applications for serum and urine protein electrophoresis and immunofixation. In: Detrick B, Hamilton RG, Schmitz JL, eds. Molecular and Clinical Laboratory Immunology. 8th ed. Wiley; 2016:chap 8

Performance**Method Description**

Urine proteins are separated in an electric field according to their size, shape, and electric charge (Helena Touch). The separation is performed on agarose gels. The proteins are visualized by staining with acid blue and the intensity of staining is quantitated by densitometry (Helena Quick Scan Touch). Multiplying by the urine protein concentration (benzethonium chloride) converts the percentage of protein in each fraction into urine concentration. (Instruction manual: Helena SPIFE Touch. Helena Laboratories, Corp; 11/2016; package insert: Helena SPIFE Touch SPE Pro 277. Helena Laboratories, Corp; 06/2018; Sykes E, Posey Y: Immunochemical characterization of immunoglobulins in serum, urine, and cerebrospinal fluid. In: Detrick B, Hamilton RG, Schmitz JL, eds. Molecular and Clinical Laboratory Immunology. 8th ed. Wiley; 2016:chap 9)

PDF Report

No

Day(s) Performed

Total Protein: Monday through Sunday

Protein Electrophoresis: Monday through Friday

Report Available

4 to 6 days

Specimen Retention Time

7 days

Performing Laboratory Location

Rochester

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 Regional Manager. For assistance, contact [Customer Service](#).

Test Classification

This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

84156

84166

86335-Immunofixation (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
REPU	Electrophoresis, Protein, Random, U	In Process

Result ID	Test Result Name	Result LOINC® Value
33044	A/G Ratio	44293-9
33045	M spike	40661-1
33046	M spike	40661-1
33047	Impression	49299-1
607975	Albumin	6942-7
607976	Alpha-1 globulin	9734-5
607977	Alpha-2 globulin	38190-5
607978	Beta globulin	9744-4
607979	Gamma globulin	9745-1
PTCON	Protein, Total, Random, U	2888-6