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**Lab Dept:** Urine/Stool

**Test Name:** MONOCLONAL PROTEIN STUDY, URINE

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***General Information***

**Lab Order Codes:** IMU

**Synonyms:** Bence Jones Urine; Heavy Chains Urine; Immunoelectrophoresis, Urine; Immunofixation, Urine; Kappa Chains Urine; Lambda Chains Urine; Light Chains Urine; Paraprotein; Special Protein Studies, Urine

**CPT Codes:** 84156 – Protein, total, except by refractometry; urine  
84166 – Protein; electrophoretic fractionation and quantitation, other fluids with concentration (eg, urine, CSF)  
86335 – Immunofixation electrophoresis; other fluids with concentration (eg, urine, CSF)

**Test Includes:** Total urine protein, reported in mg/24 hours. Electrophoresis, protein. If the protein concentration is abnormal, the following fractions, if present will be reported as a per cent of the total protein: alpha-1 globulin, alpha-2 globulin, beta-globulin, gamma-globulin.

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***Logistics***

**Test Indications:** This test is useful for detection of a monoclonal light chain in the urine of patients (Bence Jones proteinuria). It is also useful in patients with or suspected to have multiple myeloma, macroglobulinemia, amyloidosis, monoclonal gammopathies or related disorders.

**Lab Testing Sections:** Urine/Stool - Sendouts

**Referred to:** Mayo Medical Laboratories (MML Test: MPSU)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 1 - 3 days

**Special Instructions:** Submit an entire 24-hour urine No preservative. Refrigerate specimen during and after collection.

**Note:** Starting and ending times of collection are required for a timed urine collection and must be documented electronically or on the proper request form.

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**Specimen**

<b>Specimen Type:</b>	Urine, timed collection
<b>Container:</b>	Plastic leakproof container (No preservative). Urine GUARD® collection container is preferred for a timed urine sample.
<b>Draw Volume:</b>	Submit an entire 24-hour urine collection
<b>Processed Volume:</b>	50 mL (Minimum: 25 mL) from a well mixed 24 hour urine collection For random specimens: 1 mL urine minimum.
<b>Collection:</b>	For timed urine collections, empty the bladder, discard the voided sample, and note the start time. Collect all urine voided for the specified time period. At the end of the period, note the finishing time, add the last voided sample to the container by emptying the bladder. Bring the refrigerated container to the lab. Make sure all specimens submitted to the laboratory are properly labeled with the patient's name, medical record number and date of birth.
<b>Special Processing:</b>	Lab staff: Measure total urine volume. Take off 50 mL (Minimum: 25 mL) aliquot urine among one 60 mL urine tube and one 13 mL urine tube or Mayo Supply T465 (6 mL tube); keep refrigerated. Patient's age and 24-hour volume are required on request form for processing. Keep specimen refrigerated. Forward promptly.
<b>Patient Preparation:</b>	None
<b>Sample Rejection:</b>	Specimens other than urine, mislabeled or unlabeled specimens

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**Interpretive****Reference Range:**

<b>Protein, Total, Urine</b>	
>or=18 yrs	<229 mg/24 hours*
Reference values have not been established for patients that are <18 years of age.	
<b>Electrophoresis, Urine</b>	
If protein concentration is abnormal, the following fractions, if present, will be reported as a percent of total protein.	
Albumin	
Alpha-1-globulin	
Alpha-2-globulin	

Beta-globulin
Gamma-globulin
*Reference value applies to a 24 hour collection.
<p>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 is followed by immunofixation to identify the immunoglobulin heavy chain and/or light chain.</p> <p>Immunoglobulin free light chains as well as heavy chain fragments may be seen in the urine of patients with monoclonal gammopathies. The presence of a monoclonal light chain M-spike of &gt;1 g/24 hours is consistent with a diagnosis of multiple myeloma or macroglobulinemia.</p> <p>The presence of a small amount of monoclonal light chain and proteinuria (total protein &gt;3 g/24 hours) that is predominantly albumin is consistent with primary systemic amyloidosis (AL) or light chain deposition disease (LCDD).</p> <p>Because patients with AL or LCDD may have elevated urinary protein without an identifiable M-spike, immunofixation is also performed.</p>

**Critical Values:**

N/A

**Limitations:**

Monoclonal gammopathies are rarely seen in patients <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.

**Methodology:**

Turbidimetry; Agarose Gel Electrophoresis, Immunofixation

**References:**

[Mayo Medical Laboratories Web Page](#) July 2014

**Updates:**

5/24/2011: Reference range update.  
7/14/2014: Reference value update for Total protein, previously listed as <102 mg/24 hrs. Random specimens will no longer be accepted.  
6/27/2017: Method and reference range update.