MAYO CLINIC LABORATORIES

Test Definition: B2M

Beta-2-Microglobulin, Serum

Overview

Useful For

Prognosis assessment of multiple myeloma

Evaluation of renal tubular disorders

Testing Algorithm

For more information, see Multiple Myeloma: Laboratory Screening

Special Instructions

- Multiple Myeloma: Laboratory Screening

Method Name

Nephelometry

NY State Available

No

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send Renal Diagnostics Test Request (T830)

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross	OK

hemolysis	
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	28 days	
	Ambient	14 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Beta-2-microglobulin (beta-2-M) is a small membrane protein (11,800 Da) associated with the heavy chains of class I major histocompatibility complex proteins and is, therefore, on the surface of all nucleated cells. The small size allows beta-2-M to pass through the glomerular membrane, but it is almost completely reabsorbed in the proximal tubules.

Serum beta-2-M levels are elevated in diseases associated with increased cell turnover. Levels are also elevated in several benign conditions such as chronic inflammation, liver disease, kidney dysfunction, some acute viral infections, and a number of malignancies, especially hematologic malignancies associated with the B-lymphocyte lineage.

In multiple myeloma, beta-2-M is a powerful prognostic factor, and values less than 4 mcg/mL are considered a good prognostic factor.

In renal tubular disease, serum levels are low and urine levels are high. Although urine beta-2-M has been used to assess tubular dysfunction, it is not stable in urine below pH 5.5.

Reference Values

1.21-2.70 mcg/mL

Interpretation

A serum beta-2-microglobulin (beta-2-M) value of less than 4 mcg/mL is a good prognostic factor in patients with multiple myeloma. In a study of pretreatment serum beta-2-M levels in 100 patients with myeloma, it was reported that the median survival of patients with values greater than 4 mcg/mL was 12 months, whereas median survival for patients with values less than 4 mcg/mL was 43 months.

Cautions

Results determined by assays using different manufacturers or methods may not be comparable

Quantitation of specific proteins by nephelometric means may not be possible in lipemic sera due to the extreme light scattering properties of the specimen. Turbidity and particles in the specimen may result in extraneous light scattering signals, resulting in variable specimen analysis.

Clinical Reference

1. Bataille R, Magub M, Grenier J, Donnadio D, Sany J. Serum beta-2-microglobulin in multiple myeloma: Relation to presenting features and clinical status. Eur J Cancer Clin Oncol. 1982;18(1):59-66
2. Garewal H, Durie BG, Kyle RA, Finley P, Bower B, Serokman R. Serum beta-2-microglobulin in the initial staging and subsequent monitoring of monoclonal plasma cell disorders. J Clin Oncol. 1984;2(1):51-57
3. Norfolk D, Child JA, Cooper EH, Kerruish S, Ward AM. Serum beta-2-microglobulin in myelomatosis: potential value in stratification and monitoring. Br J Cancer. 1980;42(4):510-550
4. Dolan MJ, Lucey DR, Hendrix CW, Melcher GP, Spencer GA, Boswell RN. Early markers of HIV infection and subclinical disease progression. Vaccine. 1993;11(5):548-551
5. Karlsson FA, Wibell L, Evrin PE. Beta-2-microglobulin in clinical medicine. Scand J Clin Lab Invest. 1986;154:27-37
6. Greipp PR, Katzmann JA, O'Fallon WM, Kyle RA. Value of beta-2-microglobulin level and plasma cell labeling indices as prognostic factors in patients with newly diagnosed myeloma. Blood. 1988;72(1):219-223
7. Dietzen DJ, Willrich MAV. Amino acids, peptides, and proteins. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 31

Performance

Method Description

In this Siemens Nephelometer II method, the light scattered onto the antigen-antibody complexes is measured. The intensity of the measured scattered light is proportional to the amount of antigen-antibody complexes in the sample under certain conditions. If the antibody volume is kept constant, the signal behaves proportionally to the antigen volume.

A reference curve is generated by a standard with a known antigen content on which the scattered light signals of the samples can be evaluated and calculated as an antigen concentration. Antigen-antibody complexes are formed when a sample containing antigen and the corresponding antiserum are put into a cuvette. A light beam is generated with a light emitting diode, which is transmitted through the cuvette. The light is scattered onto the immuno-complexes that are present. Antigen and antibody are mixed in the initial measurement, but no complex is formed yet. An antigen-antibody complex is formed in the final measurement.

The result is calculated by subtracting the value of the final measurement from the initial measurement. The distribution of intensity of the scattered light depends on the ratio of the particle size of the antigen-antibody complexes to the radiated wavelength.(Instruction manual: Siemens Nephelometer II, Siemens, Inc.; Version 2.4, 07/2019)

PDF Report

No

Day(s) Performed

Monday through Friday, Sunday

Report Available

Same day/1 to 2 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Jacksonville Clinical Lab

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

82232

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
B2M	Beta-2-Microglobulin, S	1952-1

Result ID	Test Result Name	Result LOINC® Value
B2M	Beta-2-Microglobulin, S	1952-1