



Tests to assess proteins and other substances in the blood

Many tests are used to assess proteins and other substances in the blood of multiple myeloma patients. These tests measure levels of blood calcium, total protein, serum beta-2 microglobulin, LDH, C-reactive protein, and blood glucose. They are used to monitor the disease and its potential complications.

These tests are part of a basic medical exam and are useful in diagnosing and monitoring myeloma.

Calcium

REFERENCE RANGE

9–10.5 mg/dL

- ✎ This test is used to assess the **"C"** in the **CRAB** criteria – elevated calcium in the blood. Calcium is stored in the bones and is released as part of normal bone remodeling (the body constantly breaks down and rebuilds bone). Myeloma grows in the bone marrow, where it changes the environment inside the marrow. At the same time, it causes a cascade of cellular events that can result in increased bone breakdown. Increased bone breakdown results in both an increased level of calcium in the blood and an increased risk of fractures. A high blood calcium level can also damage the kidneys. (see [Tests to Assess Kidney Function \(/myeloma-kidney-tests\)](/myeloma-kidney-tests)).

Total Protein Test Measure

REFERENCE RANGE

6–8 g/dL

Total protein measures the total amount of blood protein, including both alk
 Privacy settings ntiful protein in the blood) and globulin. If M-protein is present .

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myeloma. If you have been diagnosed and treated for active myeloma, your doctor will use more specific tests to assess the amount of M-protein in your blood and/or urine.

Beta-2 Microglobulin (β 2-microglobulin, β 2 M, β 2M)

REFERENCE RANGE

0.70–1.80 mg/L

The serum β 2M level indicates the amount and activity of the underlying myeloma. It is one of two blood proteins (the other is serum albumin) included in the revised International Staging System (R-ISS) ([/node/1170](#)) to help understand the potential for the aggressiveness of newly diagnosed myeloma.

In addition to its function in staging myeloma during the initial work-up, β 2M can be used to evaluate disease activity and to monitor response to treatment.



A serum β 2M of < 3.5 mg/L is considered stage I;
between 3.5 mg/L and 5.5 mg/L is stage II; and
 $\geq$ 5.5 mg/L is stage III.

Lactate Dehydrogenase (LDH)

LDH REFERENCE RANGE

105–333 IU/L (international units per liter)

High LDH can be a sign of aggressive disease and is therefore included in the R-ISS to help determine prognosis. LDH is an enzyme found in almost all body tissues. It plays an important role in cellular respiration, the process by which glucose (a sugar) is converted into usable energy for cells. Although LDH is abundant in tissue cells, blood levels of the enzyme are normally low. Howe

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≤ 8.0 mg/L (in healthy individuals, < 8 mg/L)

CRP is an indicator of inflammation, and its measurement is used routinely in assessing heart disease and autoimmune diseases. CRP is produced by the liver and released into the bloodstream within a few hours after tissue injury, the start of an infection, or another cause of inflammation. Increased levels of CRP indicate active myeloma.

Blood Glucose or Blood Sugar Test

REFERENCE RANGE

70–100 mg/dL (fasting blood glucose level)

The level of glucose, a major source of energy for most cells, should be established before you start treatment. Also, it should be monitored carefully if you are taking dexamethasone (/dexamethasone) or another glucocorticosteroid.



These steroids, which are common components of myeloma treatment regimens, can cause the level of blood glucose (sugar) to rise. If not controlled, elevated blood sugar can result in diabetes.

Electrolytes

Electrolytes are substances that conduct electricity in the body. Examples of electrolytes include sodium, potassium, chloride, and bicarbonate. Electrolytes do the following:

- regulate nerve function
- regulate muscle function
- hydrate the body
- balance blood acidity and pressure
- rebuild damaged tissue

Your healthcare professional will evaluate your electrolyte levels to see if they are off. Electrolyte imbalances may cause kidney disease.

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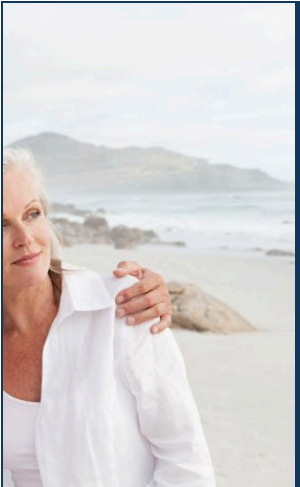


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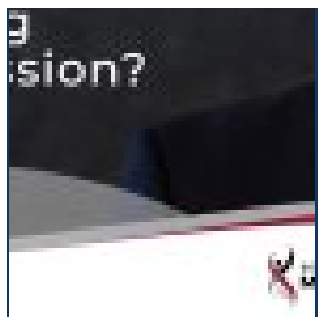
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The International Myeloma Foundation medical and editorial content team

Comprised of leading medical researchers, hematologists, oncologists, oncology-certified nurses, medical editors, and medical journalists, our team has extensive knowledge of the multiple myeloma treatment and care landscape.

Additionally, the content on this page is medically reviewed by myeloma physicians and healthcare professionals.

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