



Understanding Lab Tests for Multiple Myeloma

A Guide for Patients and Caregivers

Johnson&Johnson

What's Inside

To help you through your multiple myeloma journey, this booklet provides:

- An overview of **common laboratory tests** and some additional tests used for diagnosing and monitoring multiple myeloma
- A **My Lab Results Tracker**. This tracker is provided for you to write down your test results and compare them against the reference ranges for normal results
 - The reference ranges vary across laboratories based on their testing methods. The reference ranges in this booklet may be different from the ones in the lab report provided by your healthcare team

Be sure to contact your healthcare team if your lab results appear outside of the normal range listed on your lab report or if you have questions about your test results.
- A **glossary** to help explain terms. If you see a word that is bold and colored, like **multiple myeloma**, you can look up the definition in the glossary.

The information in this booklet is not intended to list all lab tests that are available and is not intended to recommend which tests should be performed. Your healthcare team is responsible for determining which lab tests are appropriate for you, depending on your age, gender, medical history, and other factors.



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Multiple Myeloma Overview

What Is Multiple Myeloma?

Multiple myeloma (also called myeloma) is a rare blood cancer that affects a type of white blood cell called a **plasma cell**. With multiple myeloma, normal, healthy plasma cells become cancerous (also called **malignant**) and start to build up abnormally, usually in the **bone marrow**, the soft center of the bone.¹

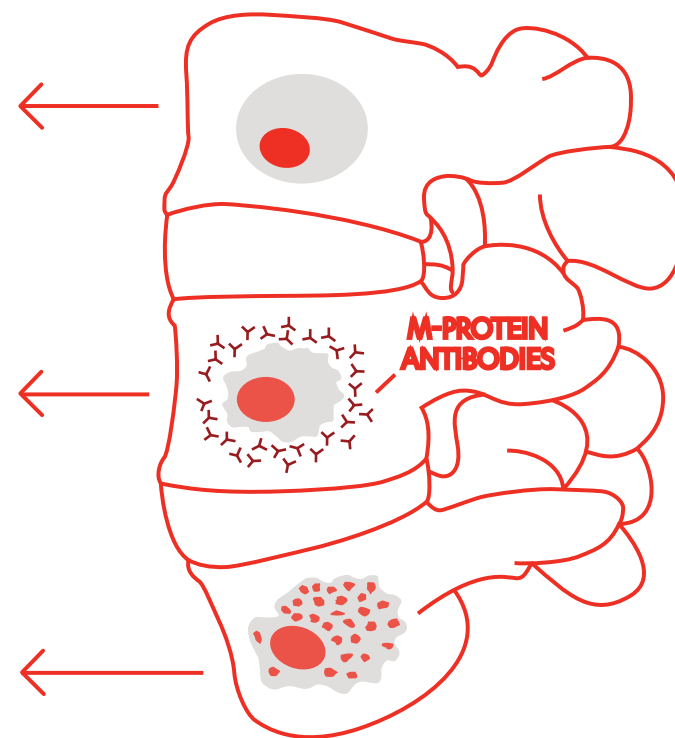
Multiple myeloma cells make an abnormal **antibody** called **M-protein** or monoclonal protein.¹ M-proteins can be detected in the blood or urine through lab tests prescribed by your healthcare team.

How Does Multiple Myeloma Develop?

Normal, healthy plasma cells are white blood cells that produce antibodies. Antibodies are part of the immune system and help the body to fight infections.

When plasma cells have DNA damage, they can overproduce. This can weaken the immune system and can lead to abnormal amounts of M-protein that can damage the kidneys, cause bone loss, and have many other impacts to the body.

These damaged (cancerous) plasma cells rapidly spread and crowd out normal cells, forming cancerous tumors in the bone marrow or soft tissue.



Multiple Myeloma Is Treatable

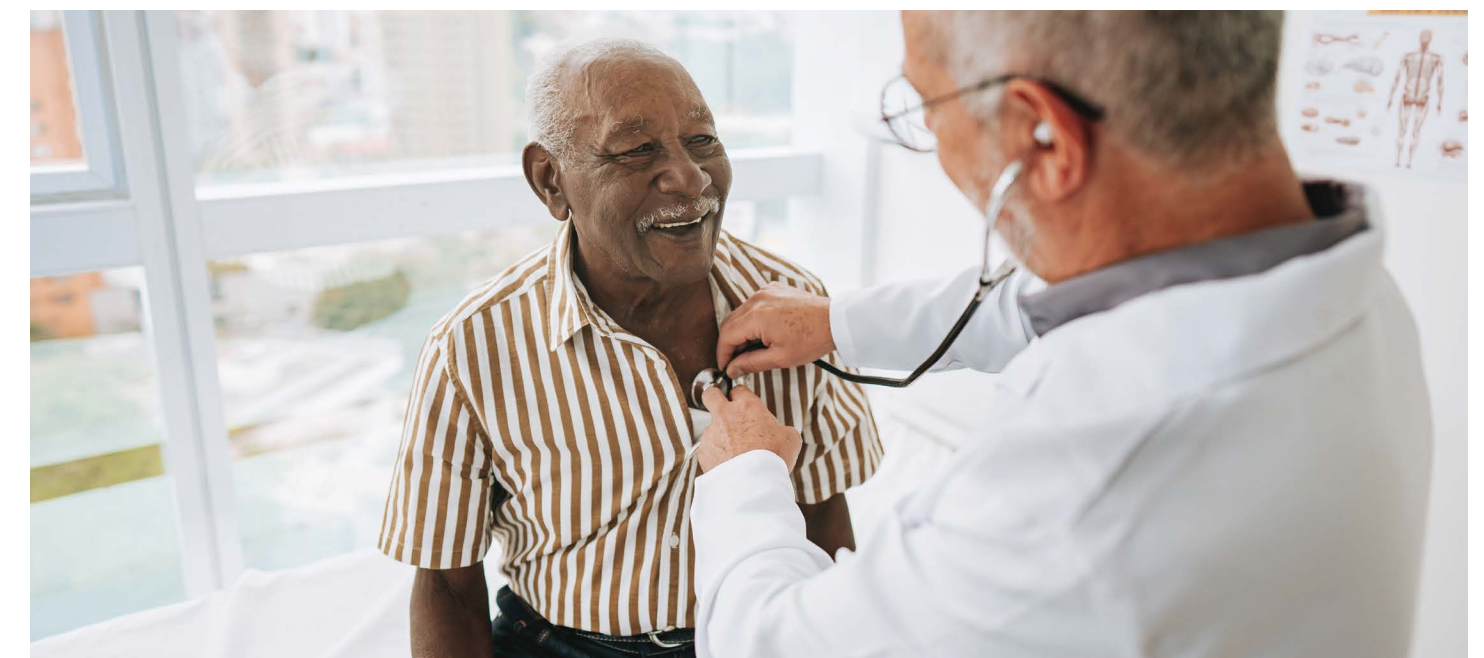
While there is no cure for multiple myeloma, it can be treated and controlled, like a chronic medical condition.¹

There are many approved treatments for multiple myeloma available in the United States and Europe. Research through clinical trials may bring more treatment options in the future.

Characteristics of Multiple Myeloma

Multiple myeloma has characteristics that affect the body with a repeating pattern throughout the course of treatment.

- It is expected that most patients will experience several instances when symptoms may reduce or stop for a period of time (called **response**) and then return (called **relapse**)
- For patients with standard-risk disease, the first period of response can last 2–3 years or even longer
- If multiple myeloma returns, a different or additional treatment may be suggested¹



Lab Test Overview

If your healthcare team suspects you have multiple myeloma, you will be asked to have some lab tests performed. They include blood tests, tissue tests, urine tests, and imaging studies. In some cases, you may be asked to do additional tests.

The test results will help your healthcare team to:

- Identify if you have multiple myeloma and determine which type
- Determine if treatment should begin at the time of diagnosis
- Determine which tests will be needed to monitor your progress

Before any lab testing is done, your doctor will record your medical history and do a physical examination to check your general health.¹

If there is any preparation needed before a test, your healthcare team will provide instructions.



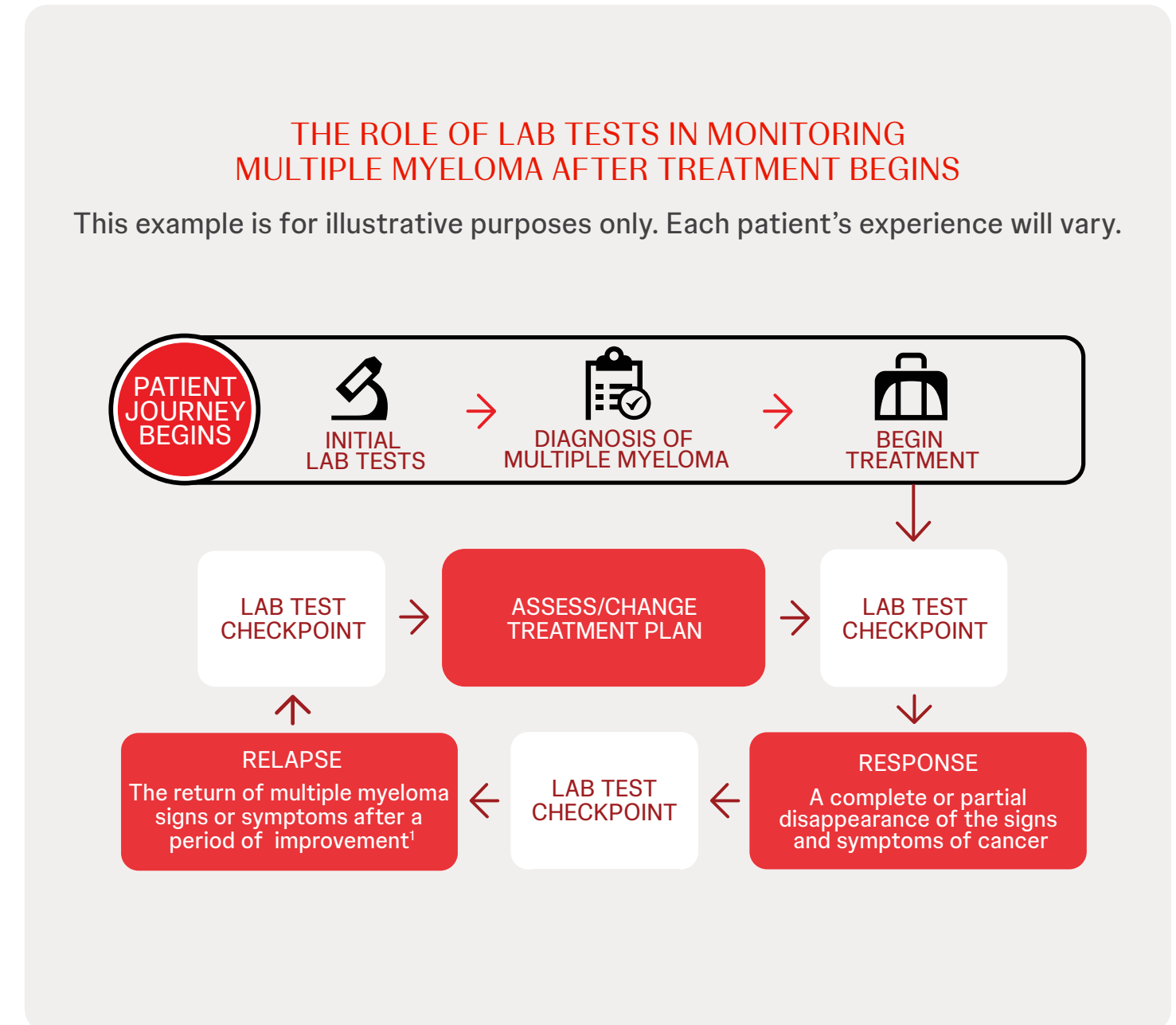
What You Can Do

- Keep your appointments for lab tests to allow your healthcare team to closely monitor the status of your condition. Depending on the test results, changes to your treatment plan may be recommended.
- Stay educated about multiple myeloma, and reach out to resources that may support your needs. See page 14 for a list of some multiple myeloma education and support groups.
- Take an active role in your treatment plan. Track your lab test results and write down questions for your healthcare team. See pages 9–13 for a tool that may help.
- Speak openly and honestly with your healthcare team to help them better manage your treatment plan.

The Role of Lab Tests in Monitoring Multiple Myeloma

If you receive treatment for multiple myeloma, your healthcare team will request that you take lab tests on a regular basis. The test results will help them monitor your status and manage your medications throughout treatment.

See the diagram below for an illustration of how lab tests are part of monitoring and managing multiple myeloma.



Common Laboratory Tests for Diagnosing and Monitoring Multiple Myeloma



Blood Tests

Blood tests can reveal signs of multiple myeloma. Different parts of the blood will be evaluated: **red blood cells** (RBCs), **white blood cells** (WBCs), and **platelets** (Plt).¹

Complete Blood Count (CBC) With Differential and Platelets

CBC measures the number of blood cells in a blood sample. The **differential** measures the different types of white blood cells in the sample. As multiple myeloma cells reproduce in the bone marrow, too few normal blood cells are made.¹

Abnormal test results may be signs of anemia, liver disease, kidney disease, or an increased risk of infection.

Red blood cell (RBC) count (erythrocytes)

Reference Range: 4.2–5.9 million/ μ L

RBCs are also called erythrocytes. They deliver oxygen to all parts of the body and take away carbon dioxide. Red blood cells are usually the first to decrease in number in response to active multiple myeloma.

Absolute neutrophil count (ANC)

Reference Range: 2,000–8,250/ μ L

Neutrophils are a type of WBC that helps fight infections caused by bacteria and fungi. A low neutrophil count (**neutropenia**) can increase the risk of infection.

Hematocrit (Hct)

Reference Range:

Female: 37%–47%

Male: 42%–50%

Hematocrit is the volume percentage of red blood cells in the blood.

Hemoglobin (Hgb)

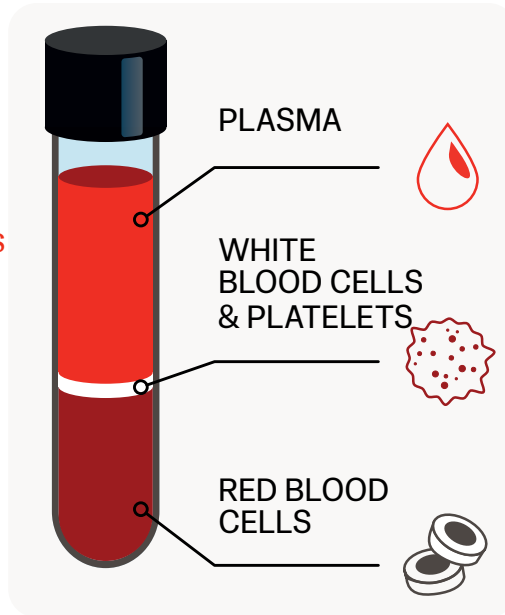
Reference Range:

Female: 12–16 g/dL

Male: 14–18 g/dL

Hemoglobin transports oxygen to the organs and tissues of the body. A low hemoglobin count can be a sign of anemia, which is an early indicator of active multiple myeloma.

COMPOSITION OF BLOOD



Platelet (Plt) count

Reference Range: 150,000–450,000/ μ L

Platelets are blood cells that help blood to clot and prevent bleeding. Some treatments for multiple myeloma can cause low platelets, resulting in severe bruising or bleeding. Your platelet count should be checked regularly.

White blood cell (WBC) count (leukocytes)

Reference Range: 4,000–11,000/ μ L

WBCs are a type of blood cell that fights germs, infections, and allergy-causing agents. Specific white blood cells include neutrophils, basophils, eosinophils, lymphocytes, and monocytes.

Low WBC counts can result from many types of treatment for multiple myeloma, which can reduce your body's ability to fight disease. Your WBC count will be closely tracked by your healthcare team.

Comprehensive Metabolic Panel (CMP)

A CMP is a blood test that measures the levels of 14 different chemicals in the blood that come from the liver, bones, and other tissue and organs. Abnormal levels may mean there is organ damage or disease, which could be a sign of multiple myeloma.

Blood urea nitrogen (BUN)

Reference Range: 8–20 mg/dL

BUN is a waste product made by the liver and filtered out of blood into urine by the kidneys.¹

Serum creatinine (SCr)

Reference Range:

Female: 0.50–1.10 mg/dL

Male: 0.70–1.30 mg/dL

Creatinine is waste that is filtered out of blood into urine by the kidneys.¹

Serum electrolytes

Reference Range:

Sodium: 136–145 mEq/L

Potassium: 3.5–5.0 mEq/L

Chloride: 98–106 mEq/L

Bicarbonate: 23–28 mEq/L

Electrolytes are minerals in the blood and include sodium, calcium, potassium, chloride, and bicarbonate.¹

Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

dL = deciliter; g = gram; μ L = microliter.

Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

dL = deciliter; L = liter; mEq = milliequivalent; mg = milligram; μ L = microliter.

Liver function tests

Liver function tests measure the levels of certain enzymes and proteins in the blood (listed below). If levels are higher or lower than normal, it may indicate liver disease or damage.¹

TEST NAME	REFERENCE RANGE
Serum alanine transaminase (ALT, SGPT)	10–40 U/L
Serum aspartate transaminase (AST, SGOT)	10–40 U/L
Serum alkaline phosphatase (ALP)	30–120 U/L
Serum albumin	3.5–5.5 g/dL
Total serum protein	5.5–9.0 g/dL
Total serum bilirubin	0.3–1.0 mg/dL

Serum calcium

Reference Range: 8.6–10.2 mg/dL

Calcium is a mineral found in bones as well as other parts of the body. Too much calcium (hypercalcemia) can damage kidneys and cause symptoms of fatigue, weakness, and confusion.¹

Plasma glucose (fasting blood glucose level)

Reference Range: 70–99 mg/dL

Blood glucose (sugar) is a major source of energy for most cells.

Some medications for multiple myeloma can cause the level of blood glucose to rise. Monitoring blood glucose levels is important, as elevated levels could indicate pre-diabetes or diabetes.

Other Blood Tests

Serum quantitative immunoglobulins (Igs)

Reference Range:

IgA: 90–325 mg/dL

IgG: 800–1,500 mg/dL

IgM: 45–150 mg/dL

This test measures the amount of 3 different antibodies in the blood (IgA, IgG, and IgM). An abnormal level of a single antibody could be a sign of multiple myeloma.¹

Serum free light chains (sFLC)

Reference Range:

FLC κ : 3.3–19.4 mg/L

FLC λ : 5.7–26.3 mg/L

κ/λ ratio: 0.26–1.65

Free light chains are short fragments of M-proteins made by multiple myeloma cells.¹ If levels are higher than normal, it may mean multiple myeloma is present.¹

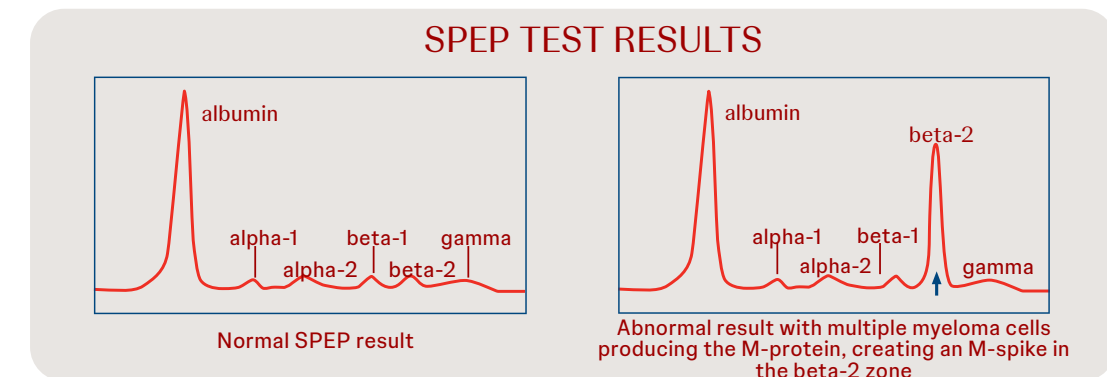
Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

ALP = alkaline phosphatase; ALT = alanine transaminase; AST = aspartate transaminase; dL = deciliter; FLC = free light chain; g = gram; Ig = immunoglobulin; κ = kappa; λ = lambda; L = liter; M-protein = monoclonal protein; mg = milligram; SGOT = serum glutamic oxaloacetic transaminase; SGPT = serum glutamic-pyruvic transaminase; U = unit.

Serum protein electrophoresis (SPEP)

SPEP quantitatively measures the amount of M-protein in the blood. For most types of multiple myeloma, the amount of M-protein production is directly related to the number and/or activity of multiple myeloma cells.

Electrophoresis is a process where blood proteins (albumin and globulins) are separated in a pattern of bands. If the results show a spike in any of the globulins (also called **M-spike**), it is a sign that multiple myeloma cells are in the blood.



Serum immunofixation electrophoresis (SIFE)

SIFE shows the type of M-proteins in the blood by identifying which forms of **heavy chains** (IgG, IgA, etc.) and **light chains** (kappa or lambda) are present.¹

Serum β 2 microglobulin (β 2M)

Reference Range: 0.54–2.75 mg/L

This is a protein made by cells, including multiple myeloma cells.¹ The level of serum β 2M indicates the activity of multiple myeloma cells. This test can be used to evaluate disease activity and to monitor response to treatment.

Serum lactate dehydrogenase (LDH)

Reference Range: 80–225 U/L

LDH is an enzyme found in almost all body tissues and is normally low in the bloodstream. LDH rises when multiple myeloma is actively growing. High levels of LDH can be a sign of more advanced disease.

Serum uric acid

Reference Range: 3.0–7.0 mg/dL

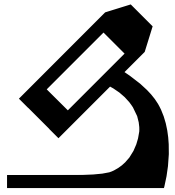
Uric acid is one of the chemicals released by dying cancer cells. High levels of uric acid in the blood can cause damage to organs, such as the kidneys.¹

Peripheral blood smear

This is a manual visual analysis of a blood sample. It is performed to determine any abnormalities in the appearance of red blood cells, white blood cells, and platelets. Abnormal red blood cells may indicate liver disease, kidney failure, or anemia. Abnormal white blood cells may indicate infection or bone marrow disorders, such as multiple myeloma.

Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

β 2 = beta-2; dL = deciliter; Ig = immunoglobulin; L = liter; M-protein = monoclonal protein; M-spike = monoclonal spike; mg = milligram; U = unit.



Tissue Tests

Since multiple myeloma cells are usually found in bone marrow, a sample of body tissue or fluid is needed from the bone marrow. The tissue sample is analyzed to see if any multiple myeloma cells are there.¹

Bone marrow biopsy and aspiration with immunohistochemistry (IHC) and/or multi-parameter flow cytometry¹

Multiple myeloma cells are most frequently found in bone marrow. This test collects 2 samples of the bone marrow, which are then sent to a lab for evaluation:

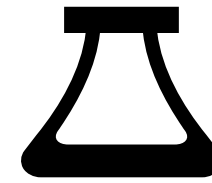
- Bone marrow biopsy removes a small piece of solid bone
- Bone marrow aspiration removes a small amount of liquid bone marrow from inside the bone

IHC is a test used to identify the number and type of multiple myeloma cells in the bone marrow. Multiple myeloma can be diagnosed if at least 10% of the plasma cells in the bone marrow sample are multiple myeloma cells.

Flow cytometry identifies abnormal plasma cells in the bone.

Fluorescence *in situ* hybridization (FISH) in bone marrow

FISH is used to assess the **chromosomes** of all multiple myeloma cells in a bone marrow sample. It detects changes in chromosomes to determine if multiple myeloma cells are growing.



Urine Tests

Urine tests can help your doctor diagnose and monitor multiple myeloma. These tests can be used to see how well your kidneys are working and how well you are responding to treatment.¹

Creatinine clearance

Reference Range: 90–140 mL/min/1.73 m²

This test checks how well your kidneys are working by measuring how long it takes your kidneys to get rid of creatinine in the blood.

Creatinine is waste that is filtered out of blood into urine by the kidneys.

This test requires a 24-hour collection of urine.¹

24-hour urine for total protein

Reference Range: <100 mg/24 hr

This test measures the total amount and types of protein in urine.

It can show the amount of light chains in the urine, which helps your doctor assess how much multiple myeloma is in your body (**tumor burden**).

This test requires a 24-hour collection of urine.¹

Urine protein electrophoresis (UPEP)

UPEP measures the amount of M-proteins and light chains in the urine.¹

For people with multiple myeloma, higher than normal levels of light chains in the urine means there is a greater risk of kidney damage.¹

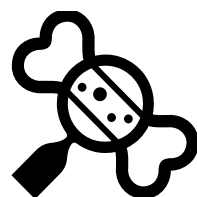
M-protein in the urine is a sign of multiple myeloma.

Urine immunofixation electrophoresis (UIFE)¹

This test identifies the type of M-protein and light chains in urine.

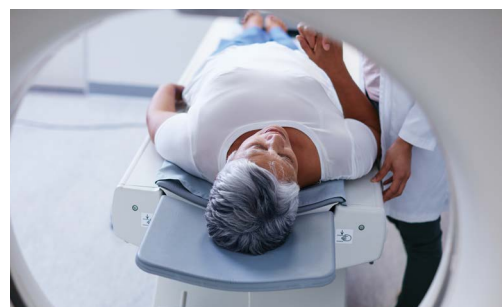
Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

hr = hour; m² = meter squared; M-protein = monoclonal protein; mg = milligram; MGUS = monoclonal gammopathy of undetermined significance; min = minute; mL = milliliter.



Imaging Studies

Most people who are diagnosed with multiple myeloma have some level of bone disease. Imaging studies can help your doctor assess the status of your bones at diagnosis or check how you are responding to treatment.



Whole-body low-dose CT scan

A CT scan is a series of X-rays using a low dose of radiation to detect **bone lesions**¹ and **paramedullary plasmacytomas** or **extramedullary plasmacytomas**.

This is the preferred baseline imaging study for newly diagnosed multiple myeloma patients, according to the International Myeloma Foundation.

FDG PET/CT scan

An FDG PET/CT scan is highly accurate and is used for diagnosis, therapy assessment, and **prognosis** of multiple myeloma. It provides information about past damage and current multiple myeloma activity. It is a 2-part test.

FDG/PET detects areas where multiple myeloma is growing outside and inside bone marrow.

- For the first part of the test (FDG/PET), you will get an injection with a liquid compound that allows any multiple myeloma cells to appear brighter in images (called a **radiotracer**). The scan will show where, and to what extent, cancer cells are actively dividing in the body¹
- For the second part of the test, a CT scan will be performed for further evaluation of the highlighted cells

Whole-body magnetic resonance imaging (MRI) without contrast

MRI is a study that uses magnetic energy and radio waves to produce a detailed 2- or 3-dimensional image of structures inside the body. No radiation is used for this study.

MRI can help identify early **focal lesions** in the bone marrow as well as **plasmacytomas**.

MRI “without contrast” means that there is no contrast dye injected into the body as part of the test. Contrast is not usually needed for an MRI scan of the bone. More importantly, to prevent kidney failure, patients with multiple myeloma should avoid contrast.¹

Bone survey (also called skeletal survey)

A bone survey uses X-rays to take pictures of the body to look for broken or damaged bones.¹

Bone surveys are the least sensitive method to detect bone damage caused by multiple myeloma. Where available, CT scans have replaced X-rays because they are better at showing bone lesions.¹

Additional Tests Used in Certain Cases

In certain circumstances, your healthcare team may request one or more of these tests:

Plasma cell proliferation

This is a blood test that shows what percentage of multiple myeloma cells are dividing. A large number of dividing cells is a sign that the cancer is growing quickly.¹

Serum viscosity

Reference Range: 1.4–1.8 centipoise

This test measures the thickness of blood (viscosity). If blood is too thick, it can lead to neurologic symptoms, headaches, vision problems, bleeding, and damage to your kidneys and other organs.¹

Echocardiogram

An echocardiogram is an imaging test of your heart to check how well it is beating and pumping blood. In some people, the heart can be affected by multiple myeloma symptoms and treatments.¹

Light chain amyloidosis¹

A buildup of amyloid is called amyloidosis. Amyloid is a rare protein found in people with abnormal plasma cells that make abnormally folded light chains. Amyloid can collect in tissues and organs, such as the heart and kidneys, which can damage them.

Tests for light chain amyloidosis can be done on a sample of bone marrow, the fat from under the skin of the belly, or an organ that has amyloid deposits in it.

My Lab Results Tracker

You can use this tracker to record your lab results after you receive a lab report from your healthcare team.

Be sure to contact your healthcare team if your lab results appear outside of the normal range or if you have questions about your test results.

- 1 ADD THE DATE OF YOUR TESTS
- 2 RECORD YOUR RESULTS OR NOTES FOR EACH TEST

BLOOD TEST			
Complete Blood Count (CBC) With Differential and Platelets			
TEST	REFERENCE RANGE	DATE/RESULTS	DATE/RESULTS
Absolute neutrophil count (ANC)	2000–8250/ μ L	1	03/12
		2	my results

Common Laboratory Tests for Diagnosing and Monitoring Multiple Myeloma

BLOOD TESTS					
Complete Blood Count (CBC) With Differential and Platelets ¹					
TEST	REFERENCE RANGE	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
Absolute neutrophil count (ANC)	2,000–8,250/ μ L	_____	_____	_____	_____
Hematocrit (Hct)	Female: 37%–47% Male: 42%–50%	_____	_____	_____	_____
Hemoglobin (Hgb)	Female: 12–16 g/dL Male: 14–18 g/dL	_____	_____	_____	_____
Platelet (Plt) count	150,000–450,000/ μ L	_____	_____	_____	_____
Red blood cell (RBC) count (erythrocytes)	4.2–5.9 million/ μ L	_____	_____	_____	_____
White blood cell (WBC) count (leukocytes)	4,000–11,000/ μ L	_____	_____	_____	_____

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Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

dL = deciliter; g = gram; μ L = microliter.

Continued on next page

My Lab Results Tracker

N/A = not applicable (A reference range does not exist for these tests.)

BLOOD TESTS (continued)				
Other Blood Tests ¹				
TEST	REFERENCE RANGE	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
Serum quantitative immunoglobulins	IgA: 90–325 mg/dL IgG: 800–1,500 mg/dL IgM: 45–150 mg/dL	_____	_____	_____
Serum free light chains (sFLC)	FLCκ: 3.3–19.4 mg/L FLCλ: 5.7–26.3 mg/L κ/λ ratio: 0.26–1.65	_____	_____	_____
Serum protein electrophoresis (SPEP)	N/A	_____	_____	_____
Serum immunofixation electrophoresis (SIFE)	N/A	_____	_____	_____
Serum β2-microglobulin	0.54–2.75 mg/L	_____	_____	_____
Serum lactate dehydrogenase (LDH)	80–225 U/L	_____	_____	_____
Serum uric acid	3.0–7.0 mg/dL	_____	_____	_____
Peripheral blood smear	N/A	_____	_____	_____
TISSUE TESTS ¹				
TEST	REFERENCE RANGE	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
Bone marrow biopsy and aspiration with IHC and/or multi-parameter flow cytometry	N/A	_____	_____	_____
FISH on bone marrow	N/A	_____	_____	_____

DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
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Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient’s test result in relation to the reference range depends on the clinical context.

β2 = beta-2; dL = deciliter; FISH = fluorescence in situ hybridization; FLC = free light chain; IHC = immunohistochemistry; κ = kappa; λ = lambda; L = liter; mg = milligram; U = unit.

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My Lab Results Tracker

N/A = not applicable (A reference range does not exist for these tests.)

URINE TESTS ¹					
TEST	REFERENCE RANGE	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
Creatinine clearance	90–140 mL/min/1.73 m ²	_____	_____	_____	_____
24-hour urine for total protein	<100 mg/24 hr	_____	_____	_____	_____
Urine protein electrophoresis (UPEP)	N/A	_____	_____	_____	_____
Urine immunofixation electrophoresis (UIFE)	N/A	_____	_____	_____	_____
IMAGING STUDIES ¹					
TEST	REFERENCE RANGE	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
Whole-body low-dose CT scan	N/A	_____	_____	_____	_____
FDG PET/CT scan	N/A	_____	_____	_____	_____
Whole-body MRI without contrast	N/A	_____	_____	_____	_____
Bone survey	N/A	_____	_____	_____	_____

Additional Tests Used in Certain Cases¹

TEST	REFERENCE RANGE	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS	DATE / RESULTS
Plasma cell proliferation	N/A	_____	_____	_____	_____
Serum viscosity	1.4–1.8 centipoise	_____	_____	_____	_____
Echocardiogram	N/A	_____	_____	_____	_____
Light chain amyloidosis	N/A	_____	_____	_____	_____

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Reference ranges vary across laboratories based on lab testing methods and may not be applicable to the reference ranges at your center. Interpretation of a particular patient's test result in relation to the reference range depends on the clinical context.

CT = computed tomography; FDG = F-fluorodeoxyglucose; hr = hour; m² = meter squared; mg = milligram; min = minute; mL = milliliter; MRI = magnetic resonance imaging; PET = positron emission tomography.

Glossary:

Words to Know

Anemia: A condition in which the number of red blood cells is low, resulting in low levels of oxygen in the body. Anemia may cause shortness of breath and feelings of exhaustion.

Antibody: A protein made by plasma cells to help fight off infections; also called immunoglobulin.¹

Bone marrow: The soft, sponge-like center inside most bones and where most blood cells are made.¹

Chromosome: A strand of DNA and proteins in the nucleus of a cell that contains genes. Chromosomes transmit genetic information to cells. Human cells normally have 46 chromosomes (23 pairs).

Differential: Measures the different types of white blood cells in a blood sample.¹

Extramedullary plasmacytoma: A tumor made up of monoclonal plasma cells that is found in soft tissue outside of the bone marrow and separate from bone.

Focal lesion: A defined area of irregular cells seen in the bone marrow on MRI and PET/CT studies. In order to be considered multiple myeloma, there must be at least 2 focal lesions seen on MRI that are at least 5 millimeters (mm) in size.

Free light chain: The unattached, shorter fragments of M-proteins made by multiple myeloma cells.¹

Heavy chain: A longer protein chain that is part of an antibody.¹

Lesion: An area of abnormal tissue; a lump or abscess that may be caused by injury or disease, such as cancer. In multiple myeloma, “lesion” can refer to a plasmacytoma or a hole in the bone.

Light chain: A shorter protein chain that is part of an antibody.¹

M-protein: An abnormal antibody made by multiple myeloma cells that does not fight infections. Also called monoclonal protein.¹

M-spike: A monoclonal spike that appears as a sharp pattern on protein electrophoresis tests. This is a marker for the activity of multiple myeloma cells.

Malignant: Cancerous; capable of invading nearby tissue and spreading to other parts of the body.

Multiple myeloma: A cancer of the bone marrow plasma cells, white blood cells that make antibodies. The cancerous plasma cells are called multiple myeloma cells.

Neutropenia: A reduced level of a type of white blood cell, neutrophils, which fight bacterial infections.

Paramedullary plasmacytoma: The destruction of an area of bone in addition to soft tissue damage that is located outside of the bone.

Plasma cell: A type of white blood cell that makes proteins that fight germs.¹

Plasmacytoma: A mass formed by abnormal plasma cells (multiple myeloma cells).¹

Platelets: Also called thrombocytes; platelets are blood cells that help blood clot to prevent bleeding.

Prognosis: The likely or expected course and outcome of a disease.¹

Progression: The growth or spread of cancer after a patient has been tested or treated.¹

Radiotracer: A compound that is injected into the body to detect areas of active cancer cell division.

Red blood cells: Also called erythrocytes; red blood cell production is stimulated by a hormone (erythropoietin) that is made by the kidneys. Patients with multiple myeloma who have damaged kidneys do not produce enough erythropoietin and can become anemic.

Relapse: The return of multiple myeloma signs or symptoms after a period of improvement.¹

Response: Response means there is complete or partial disappearance of the signs and symptoms of cancer.

Tumor burden: A measure of the extent or amount of cancer in the body.¹

White blood cells: Also called leukocytes; a type of blood cell that fights germs, infections, and allergy-causing agents. Specific white blood cells include neutrophils, basophils, eosinophils, lymphocytes, and monocytes.

Multiple Myeloma Education and Support Groups

Living with multiple myeloma, or caring for someone who has it, requires physical and emotional support. Here is a short list of independent organizations that provide education and support groups that may be able to help.

For additional organizations not listed here, you can use the **Advocacy Connector (cancer.com)**, a Janssen-sponsored resource that connects patients and caregivers to national and state-specific advocacy groups that offer resources that may be relevant to your needs.



American Cancer Society (cancer.org)

The American Cancer Society offers information, day-to-day help, and emotional support to cancer patients as well as their family and friends. From free lodging and transportation to help making decisions about patient care, they offer programs, services, and resources that can help patients on their journey.

Black Myeloma Health Community Chapter

(healthtree.org/myeloma/community/chapters/african-american-myeloma-chapter)

The Black Myeloma Health Community Chapter strives to connect, support, and provide resources and education to the Black multiple myeloma community.

Cancer Support Community (cancersupportcommunity.org)

Cancer Support Community offers social and emotional support for people impacted by cancer, as well as a community of support available online and over the phone.

HealthTree Foundation for Multiple Myeloma (healthtree.org)

This foundation aggregates and shares the latest research and provides social media groups where patients can exchange information. They also host live patient meetings and seminars, especially for relapsed and high-risk patients.

International Myeloma Foundation (myeloma.org)

The International Myeloma Foundation provides information online and by phone. They offer patient and caregiver education materials and conduct patient and family seminars and regional community workshops. They can also help patients and caregivers find support groups.

Leukemia and Lymphoma Society (lls.org)

The Leukemia and Lymphoma Society (LLS) offers information specialists, peer-to-peer support, and online chats for both patients and caregivers. They also produce the “Bloodline with LLS” podcast for cancer survivors and offer financial guidance and support.

M-Power (mpower.myeloma.org)

M-Power raises awareness in Black communities to empower healthcare professionals, community leaders, neighborhoods, and families to improve the short- and long-term outcomes of Black patients with multiple myeloma.

Multiple Myeloma Research Foundation (themmrf.org)

The Multiple Myeloma Research Foundation offers patient education programs and a nurse support line. They can also help patients and caregivers find a treatment center, clinical trials, support groups, and financial assistance programs.

The Myeloma Beacon (myelomabeacon.org)

The Myeloma Beacon provides news, resources, and online forums for patients, medical professionals, and others interested in multiple myeloma.

Patient Empowerment Network (powerfulpatients.org)

Patient Empowerment Network (PEN) equips patients and caregivers with the tools and resources needed to understand their cancer diagnosis and take an active role in their treatment journey.

Patient Power (patientpower.info/multiple-myeloma)

Patient Power maintains a rich library of cancer information videos for patients and professionals alike. They can also help locate financial, insurance, and family resources.

Throwing Bones (throwing-bones.org)

Throwing Bones educates and advocates for individuals living with blood cancer to improve their quality of life through healthy and active lifestyles.

Reference: 1. NCCN Guidelines for Patients® for Multiple Myeloma, 2024. © 2024 National Comprehensive Cancer Network, All Rights Reserved. Accessed March 13, 2024. To view the most recent and complete version of the NCCN Guidelines for Patients, visit NCCN.org/patientguidelines. NCCN makes no warranties of any kind whatsoever regarding their content, use or application and disclaims any responsibility for their application or use in any way.

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