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[Make an Appointment](#)

[← Back](#)

[Multiple Myeloma](#)
[Diagnosis and Treatment](#)

[Refer a Patient](#)

ABOUT US

[Our mission, vision & core values](#)

[Leadership](#)

[History](#)

[Equality, diversity & inclusion](#)

[Annual report](#)

[Give to MSK](#)

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Tests for diagnosing multiple myeloma

Blood tests

Blood tests tell us if you have too much protein, and the types of protein you have.

Myeloma cells make too much of an immunoglobulin (IH-myoo-noh-GLAH-byoo-lin) protein called monoclonal protein (m-protein). Myeloma cells also make another abnormal (not normal) protein called beta 2-microglobulin.

Blood tests can identify the protein type. We need to know this protein type because it's a unique marker. We use this information to track the disease and see how well treatment is working.

Blood tests also measure your blood cell counts (how many blood cells you have). Myeloma cells affect normal bone marrow cells. The disease causes your body to make fewer normal red and white blood cells.

Blood tests also measure how well your kidneys are working, and your levels of calcium and uric acid.

Urine tests

Urine (pee) tests show if you have signs of multiple myeloma.

Myeloma cells make immunoglobulins, sometimes in large, harmful amounts. These extra immunoglobulins can show up in your urine. Most people with myeloma have an immunoglobulin protein called Bence-Jones in their urine.

Imaging studies

Doctors use imaging tests to help find and diagnose multiple myeloma, recommend treatments, and monitor how well you respond to therapy. You may have more than 1 imaging test, because each kind gives us different information.

Most people being tested for multiple myeloma will have positron emission tomography (PET) scans or magnetic resonance imaging (MRI) scans.

Your imaging tests tell us about the size and location of cancer in your bones and other tissues. They may look at your kidneys, muscles, heart, and digestive tract.

[Learn more about imaging tests used to diagnose cancer.](#)

Bone marrow aspiration and biopsy for multiple myeloma

Bone marrow is inside your bones. It's made up of fluids (thick liquid) and solids (soft, spongy tissue). Your bone marrow has many stem cells in it. Stem cells are immature cells that make all the blood cells in your body.

There are 2 ways to get a sample of your bone marrow: [a bone marrow aspiration and a bone marrow biopsy](#).

The procedures often are done together. In some cases, you may only need an aspiration.

Bone marrow aspiration

In a bone marrow aspiration, you will get local anesthesia to numb the area first. Next, we put a thin needle into your pelvic bone. We use the needle to take out a small amount of your bone marrow liquid and cells.

Bone marrow biopsy

In a bone marrow biopsy, we put a slightly larger needle into your bone. We use the needle to take out a small sample of your bone with its marrow tissue.

If you're having both procedures, the aspiration often is done first. The aspiration and biopsy together take about 30 minutes.

Interpreting bone marrow biopsy test results

The sample from your bone marrow biopsy is sent to a pathologist to examine. A pathologist is a doctor who uses a microscope to diagnose diseases.

Out of every 100 cells in the bone marrow of a healthy person, 2 to 3 are plasma cells. If your pathologist finds more than 10

plasma cells out of every 100 cells, you may have multiple myeloma.

Pathologists also use your bone marrow tissue sample to test the chromosomes of plasma cells with cancer. It can be harder to treat multiple myeloma if the chromosomes are not normal. Your treatment results will depend on what is wrong with a chromosome.

Your pathologist also will test the surface of plasma cells in your bone marrow tissue sample using flow cytometry. This test helps us make a diagnosis and track the disease after treatment.

[Learn more about the role of pathology in diagnosing cancer](#)

Multiple myeloma stages 1, 2 & 3

Before we stage multiple myeloma, we describe what kind of plasma cell disorder you have. Diagnostic tests tell us if you have symptoms and signs of organ damage.

If you have no symptoms, you may have either:

Monoclonal gammopathy of undetermined significance (MGUS). This condition can turn into multiple myeloma. We will closely monitor it, but we don't treat it until you have symptoms.

Smoldering myeloma. This condition can turn into multiple myeloma. We will closely monitor it, but we don't treat it until you have symptoms.

If you have symptoms, you may have either:

Multiple myeloma. When you have active myeloma, you have symptoms and need treatment.

Plasmacytoma (PLAZ-muh-sy-TOH-muh). This cancer affects plasma cells and can turn into multiple myeloma. Solitary plasmacytoma is when tumor is in only 1 part of your body. It's often in a bone.

Staging is part of the diagnosis process. It tells us how advanced a cancer is. It describes the tumor's size, location, and how far it has spread. Staging helps your care team choose the best treatment and follow-up care for you.

To describe the stage, doctors use the International Staging System (ISS) and the Revised International Staging System (R-ISS). These scoring systems get information from blood tests.

The tests measure levels of beta 2 microglobulin (β 2M), albumin, and lactate dehydrogenase. To stage multiple myeloma, we use genetic tests to look at certain chromosomes to see if they're normal.

We measure your levels of:

Beta 2 microglobulin (BAY-tuh-2-MY-kroh-GLAH-byoo-lin). It's also known as β 2-microglobulin or β 2-M. This small protein is on the surface of many cells. Larger amounts of this protein in your blood or urine can be a sign of multiple myeloma.

Albumin (al-BYOO-min). It's a kind of protein in your blood, as well as in egg whites, milk, and other things.

Lactate dehydrogenase (LAK-tayt dee-hy-DRAH-jeh-nays). It's also known as LDH. It's among a group of enzymes in your blood and other tissues that help make energy in cells.

There are 3 stages of myeloma, from 1 to 3. The lower the number, the less the cancer has spread.

Stage 1 multiple myeloma
+

Stage 2 multiple myeloma
+

Stage 3 multiple myeloma
+

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