

WHAT IS MULTIPLE MYELOMA?

Multiple myeloma, also known as myeloma, is the second most common blood cancer in the United States. There has been great progress in the development of therapies to treat multiple myeloma, and in survival rates for patients diagnosed with this cancer. Read below for information about the causes, diagnosis, and treatment of multiple myeloma.

This “Patient Education” tear sheet was produced in collaboration with the Multiple Myeloma Research Foundation (MMRF).

What is Multiple Myeloma?

Multiple myeloma starts in the plasma cells in bone marrow. The bone marrow is the soft, spongy tissue found in the center of many bones where blood cells are produced.

When the plasma cells become malignant, they grow out of control, crowd out the normal blood cells that help fight infection and disease, and form a tumor. The hallmark of multiple myeloma is the presence of abnormal proteins called “M protein” or “paraprotein.” These proteins are produced by the malignant plasma cells and are responsible for various myeloma-associated symptoms, such as impaired kidney function.

What Are the Symptoms of Multiple Myeloma?

Multiple myeloma symptoms may vary by patient, with the early stages of myeloma often presenting no visible symptoms or signs. When present, the symptoms of multiple myeloma may be vague or similar to those of the other conditions. Remember that not all individuals with myeloma will have symptoms and that it is unusual for any one individual to have all of these symptoms.

The most common multiple myeloma symptoms include:

- *Bone pain or bone fractures*
- *Fatigue (related to anemia)*
- *Increased vulnerability to infections (related to low levels of white blood cells)*
- *High levels of calcium in the blood, or hypercalcemia, causing changes in urination, restlessness, confusion, increased thirst, nausea, and loss of appetite*
- *Impaired kidney function, resulting in a number of additional complications*

What Causes Multiple Myeloma?

Although scientists have made advancements in understanding how multiple myeloma develops, the cause of this disease has not yet been identified.

In most cases, multiple myeloma develops in individuals who have no known risk factors. It is believed that multiple myeloma may be the result of several risk factors acting together. Research suggests possible associations with a decline in the immune system, certain occupations, exposure to certain chemicals, and exposure to radiation. However, there are no strong connections.

While myeloma is not considered to be a hereditary disease, research has found that genetic factors may influence the development of multiple myeloma.

How is Multiple Myeloma Diagnosed?

The diagnosis of multiple myeloma is determined by a

number of different diagnostic tests, rather than a single laboratory test result. These include physical evaluation, patient history, symptoms, and diagnostic testing results. The initial evaluation to help confirm a diagnosis of myeloma includes blood and urine tests, as well as a bone marrow biopsy. Other tests include X-rays, MRIs, CT scans, and PET scans.

Having all of the appropriate multiple myeloma tests done is very important, as the results will help your doctor better determine treatment options and a prognosis. Many of these tests are also used to assess the extent of the disease and to plan and monitor treatment.

Multiple Myeloma is a Treatable Cancer

Treatment options for multiple myeloma have increased significantly over the last decade – resulting in improved survival rates among myeloma patients. There are many promising new therapies currently under investigation.

Researchers are seeking to customize treatments based on the mapping of a patient’s genome (studies of the tumor cell DNA), tailoring the right treatment for each patient. Today, we know that certain DNA alterations indicate how aggressive the myeloma is and, in some cases, test results can help guide treatment decisions or determine eligibility for multiple myeloma clinical trials.

Which Treatment Approach is Right for You?

Several factors determine treatment for multiple myeloma, including:

- *Age and general health*
- *Results of laboratory and cytogenetic (genomic) tests*
- *Symptoms and disease complications*
- *Prior myeloma treatment*
- *Patient’s lifestyle, goals, views on quality of life, and personal preferences*

Treatments range from standard-dose chemotherapy, steroids, and newer targeted agents (such as lenalidomide, thalidomide, bortezomib, carfilzomib, and pomalidomide), to high-dose chemotherapy and stem cell transplantation.

Some of these medications are taken orally, while others are given intravenously. Although each of these treatment approaches may be used alone, combinations of two or more anti-myeloma medications are commonly used.

In addition to standard treatments, clinical trials that study new treatments and combinations are an option for many patients. It is important to keep in mind that there is no one standard therapy for multiple myeloma. You and your doctor will decide on the best treatment approach for you. ●

Get Information and Support

The MMRF is a non-profit organization dedicated to accelerating the development of next-generation multiple myeloma treatments that will extend the lives of patients and lead to a cure.

The MMRF strongly believes that knowledge is power, which is why the organization has developed a variety of educational programs and resources to empower patients to take action. Available patient resources include:

- **Educational Programs** to help people with myeloma, family members, caregivers, and health-care professionals learn more about the disease and today’s most promising treatment options.
- **The Myeloma Trial Navigator** allows patients to quickly and easily search for clinical trial options that match their specific diagnosis and treatment history.
- **The MMRF CoMMunity Gateway**, where patients can go online and share their journey as active participants in the MMRF’s search for better, more targeted treatments.
- **The MMRF’s CoMMPass Study™** is a long-term, global research study in newly diagnosed multiple myeloma patients with the goal of collecting and analyzing data to accelerate the development of life-saving, personalized treatments.

Visit www.themmrff.org to access these and more resources.