Cancer

# Multiple Myeloma

What is multiple myeloma?

Multiple myeloma is a relatively rare type of blood cancer that affects the bone marrow, where new blood cells are made. It occurs when the body makes too many plasma cells, a type of white blood cell.

Plasma cells are mature B cells that produce antibodies. In people with multiple myeloma, abnormal plasma cells multiply in the bone marrow and make abnormal antibodies called M proteins, which can build up in the blood and organs. These abnormal plasma cells can clump together to form tumors in bones or soft tissue, and they can crowd out normal blood-forming cells. Over time the disease can damage the kidneys and other organs.

Who gets multiple myeloma?

About 30,300 people will develop multiple myeloma and about 12,600 people will die from it in the United States in 2017, according to the American Cancer Society. Men are slightly more likely than women to develop multiple myeloma, and it is more common among African Americans compared with other racial and ethnic groups. Most people diagnosed with multiple myeloma are age 65 or older.

What are the risk factors for multiple myeloma?

Researchers do not fully understand what causes multiple myeloma. This cancer runs in families, but most people with multiple myeloma don’t have affected family members. Radiation exposure is a known risk factor. Some research suggests that being overweight and exposure to certain chemicals may increase the risk. Excessive productive of a cell signaling molecule called interleukin-6 can trigger the development of plasma cell tumors.

What are the symptoms of multiple myeloma?

B-cells are white blood cells that produce antibodies to fight infections. Having abnormal antibodies increases the risk of infection, and multiple myeloma tumors in the bone marrow can interfere with production of other types of blood cells. Symptoms may include the following:

- Bone pain, often in the back, hips or skull
- Bone loss (osteoporosis) and easy fractures

- Low red blood cell count (anemia)
- Low white blood cell count (leukopenia)
- Low platelets, leading to easy bruising and bleeding
- Fatigue
- Frequent infections
- High blood calcium level
- Feeling very thirsty
- Frequent urination
- Constipation
- Feeling drowsy or confused
- Muscle weakness or numbness

How is multiple myeloma diagnosed?

The process of diagnosing multiple myeloma starts with a physical exam and health history. Blood tests are done to look for abnormal cells, low blood cell counts and abnormal levels of minerals like iron and calcium. X-rays, MRIs and other scans may be done to look for multiple myeloma tumors in bones or areas of bone loss. A bone marrow biopsy may be done, in which a needle is used to remove a small sample of bone marrow to examine in the laboratory.

How is multiple myeloma treated?

Treatment for multiple myeloma depends on how advanced the disease is when it is detected, how much it has spread and what symptoms are present.

Surgery: Some localized plasma cell tumors can be surgically removed, but this is seldom used as a treatment for multiple myeloma.

Radiation: Radiation may be used to kill cancer cells and shrink tumors, which can help relieve pain and other symptoms. It is often used in conjunction with other forms of treatment.

Chemotherapy: Traditional chemotherapy works by killing fast-growing cells, including cancer cells. It can also destroy rapidly dividing healthy cells, such as the normal blood-forming cells in the bone marrow. Chemotherapy for multiple myeloma often includes corticosteroids.

Biphosphonates: This type of drug may be given to strengthen the bones and prevent fractures.

Targeted therapy: Targeted drugs work against cancers with specific characteristics. For example, monoclonal antibodies that target CD38, a protein commonly found on multiple myeloma cells, can be used to destroy the cancer. Targeted treatment is often better tolerated than chemotherapy, but cancer may develop resistance over time.

Immunotherapy: This type of treatment helps the immune system fight cancer. For example, some tumors can turn off immune responses against them, and drugs known as checkpoint inhibitors can restore T cells' ability to recognize and destroy cancer cells. However, current immunotherapy drugs work for only a subset of patients and it is hard to predict who will benefit.

CAR-T: The newest type of treatment, chimeric antigen receptor T cell therapy, involves removing a sample of T cells, genetically reprogramming them to attack cancer cells and putting them back into the body. This type of treatment can lead to an excessive immune response that harms healthy tissue.

Stem cell transplant: Bone marrow contains stem cells that give rise to all types of blood cells. A patient's cancerous blood cells are destroyed with radiation or chemotherapy and replaced with either preserved stem cells from the same individual or bone marrow from a donor. There is a risk that donor immune cells will attack the recipient's tissues, known as graft-versus-host disease.

For more information about multiple myeloma, please visit our sister site Cancer Health.

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