

# Multiple Myeloma

**M**ultiple myeloma is a cancer of the bone marrow, also known as plasma cell myeloma or Kahler disease, after Dr Otto Kahler who described it in 1889. In multiple myeloma the bone marrow produces a subtype of white blood cells—plasma cells—that under normal conditions are responsible for production of **antibodies** (proteins that fight infections). These malignant plasma cells produce a **paraprotein** (an inactive antibody known also as **M protein** or **Bence Jones protein**) that adversely affects bone marrow, bones, blood, and the kidneys. Multiple myeloma is a somewhat uncommon disease that accounts for 1.1% of all cancers in white persons and 2% in elderly black persons and affects more men than women. For many years it has been known that multiple myeloma can have either a mild or very aggressive course. The December 1, 2010, issue of *JAMA* includes an article describing conditions that consistently precede the development of multiple myeloma.

## SYMPTOMS AND SIGNS

As the number of plasma cells increases, the number of red blood cells, white blood cells, and platelets in blood decreases. Also, the amount of paraprotein increases in blood and in bone marrow, destroying bone structures. That is why several seemingly unrelated symptoms are characteristic for multiple myeloma:

- Bone pain
- Bone fractures in the spine and ribs
- Spinal cord compression causing pain, muscle weakness, and urinary difficulties
- **Anemia** (a decreased number of red blood cells in blood), causing fatigue
- Repeated infections
- Nosebleeds

## DIAGNOSIS, PREVENTION, AND TREATMENT

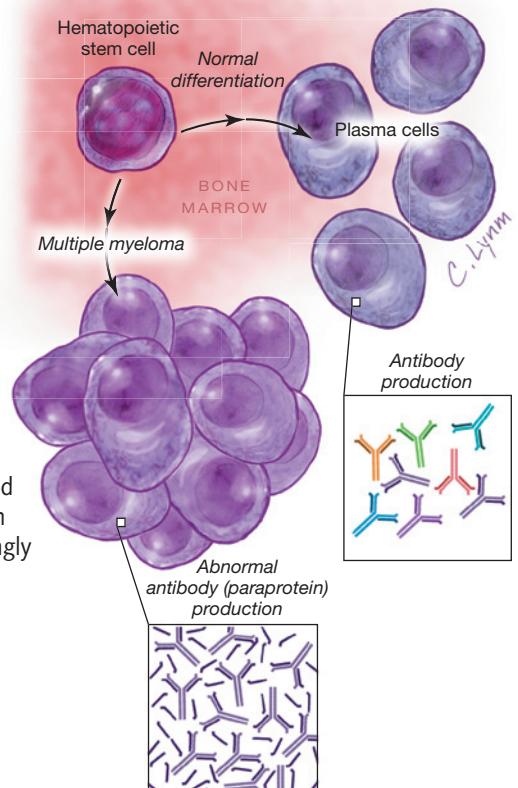
Multiple myeloma is suspected when a patient with bone pain has tests that reveal bone lesions in the skull, spine, or ribs; anemia; renal failure; and high blood calcium levels that are accompanied by the presence of paraprotein in blood and urine. The diagnosis is made when bone marrow aspiration reveals an increased number of plasma cells. Further analysis of these cells may indicate the prognosis. Recent studies show that multiple myeloma is consistently preceded by precursor states called **monoclonal gammopathy of undetermined significance** (MGUS) and **smoldering myeloma** (SMM). At this time, there is evidence that early treatment prevents progression to full-blown multiple myeloma; however, it is unknown if it leads to longer overall survival. Multiple myeloma is a treatable disease and many patients enjoy their lives for many years after diagnosis. Treatment options for multiple myeloma include drugs that affect the immune system (such as thalidomide and lenalidomide), proteasome inhibitors (such as bortezomib), **chemotherapy** (use of drugs that kill cancer cells), or radiation. Since the mid-1990s, high-dose treatment with the chemotherapy drug melphalan followed by an **autologous stem cell transplant** (using the patient's own stem cells) has been part of the therapy for newly diagnosed patients younger than 65 to 70 years without other serious diseases.

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## FOR MORE INFORMATION

- National Library of Medicine  
[www.nlm.nih.gov/medlineplus/multiplemyeloma.html](http://www.nlm.nih.gov/medlineplus/multiplemyeloma.html)
- National Cancer Institute  
[www.cancer.gov/cancertopics/wyntk/myeloma](http://www.cancer.gov/cancertopics/wyntk/myeloma)

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