



International Myeloma Foundation

Multiple Myeloma

Cancer in the Bone Marrow

Myeloma is a cancer in the bone marrow affecting blood production.

It is also called "multiple myeloma", because it affects multiple areas of bone marrow and tumors destroy surrounding bone.

Multiple myeloma has gone from being a death sentence to a disease that's not yet curable, but very treatable. Patients can now expect to live many years with this disease.

Dr. Brian Durie
Chairman, International Myeloma Foundation

Prognosis

Determined by the number of myeloma cells plus their specific properties such as rate of growth. In 2005 the International Myeloma Working Group, sponsored by the IMF, developed a new STAGING system, the International Staging System (ISS) that correlates key factors that affect prognosis. The ISS has been introduced for widespread use.

This is an exciting time in myeloma research, with new agents and new approaches coming to light at an unprecedented pace.

Susie Novis
Founder and President of the International Myeloma Foundation

Overview

Myeloma is the second most common blood cancer after lymphomas, affecting an estimated 750,000 people worldwide, and its prevalence is increasing.

Myeloma is INCURABLE but HIGHLY TREATABLE, with more than 100 drug regimens in clinical trials in the United States.

Myeloma specifically affects plasma cells (antibody-producing lymphocytes) within the bone marrow, resulting in:

- Anemia
- Destruction of bone tissue
- Reduced immune function
- Kidney failure
- Build-up of M protein (an antibody that is not needed and can cause thickening of the blood)

Symptoms include pain of varying intensity, often in the lower back or ribs with fractures occurring either spontaneously or following trivial injury. Patients have an increased risk of infection. General malaise is frequent; significant weight loss is rare.

The causes of myeloma have been extensively investigated. Several causes have been identified, including toxic chemicals, radiation, several viruses, as well as physical and psychological stress factors.

Myeloma Is an Important Focal Point for Advanced Cancer Research

Although once considered a death sentence with limited options for treatment, today there are more than 100 drugs in clinical trials in the United States alone, and multiple drug regimens can be used in sequence to help some patients maintain their daily routines for years and even decades.

The most widely prescribed drug for myeloma is THALIDOMIDE, an anti-cancer drug that can be taken by mouth. Thalidomide, a related drug called REVLIMID®, and VELCADE®, a first-in-class medication, show evidence of improved survival in clinical trials. All three are often used in combination with a steroid, dexamethasone, and they are being studied for use in sequence and in various combinations, so each time patients relapse there is a new regimen waiting for them to try.

Thalidomide was responsible for an epidemic of birth defects in Europe in the 1950's. Today it is an example of the new inroads being made in the fight against cancer:

Thalidomide has the ability not only to kill the tumor cell directly, but also to act in the bone marrow to make it impossible for the myeloma cell to grow and survive there.

Dr. Ken Anderson
Dana-Farber Cancer Institute

The International Myeloma Foundation is a not-for-profit organization supporting research and providing education, advocacy and support for myeloma patients, families, researchers and physicians.

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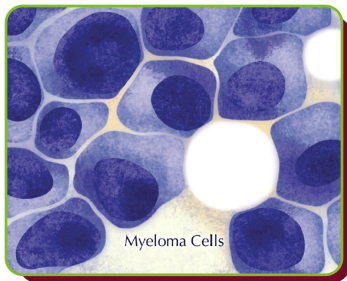
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Well-Known Patients

Don Baylor and **Mel Stottlemyre**, former Major League Baseball players turned coaches, have been diagnosed with multiple myeloma. Both continued to coach after their diagnosis.

Geraldine Ferraro, the first woman to run for vice-president in the U.S., was diagnosed in 1998. In 2005 she became the first patient to donate a DNA sample to *Bank on a Cure*®, The IMF gene bank for the study of myeloma.

Movie actor **Roy Scheider** was diagnosed with multiple myeloma and underwent a bone marrow transplant in June, 2005.



Multiple Myeloma Statistics

- Myeloma (MM) represents approximately 1% of all cancers
- Internationally, the incidence varies from <1/100,000 people in China, to 3-4/100,000 in the U.S. and most Western industrialized countries
- 50,000 Americans currently have MM
- An estimated 15,000 new cases are diagnosed each year in the U.S.
- Approximately 11,000 Americans die from MM every year
- The median age of diagnosis is approximately 65 years
- The five-year survival rate of patients ranges from 10% to 50%. However, with newer treatments, some patients live 10 to 20 years or longer, especially those diagnosed at <50 years of age.
- The male/female ratio is 3:2
- MM is twice as common in African Americans as in Caucasians

Pathology

Multiple myeloma is a cancer in which plasma cells - important components of the immune system - grow and divide in an uncontrollable fashion and accumulate in the bone marrow. Normal plasma cells make antibodies, or immunoglobulins, that help to fight disease. Myeloma cells also produce the same type of immunoglobulin protein, but this abnormal protein (M-protein) does not help protect the body from infection. In addition, the M protein that is produced can build up in organs such as the kidneys, causing serious damage over time.

Bence Jones Proteins: Myeloma cells produce incomplete immunoglobulin molecules (light chains) that can adhere to each other and to other tissues, and become deposited in tissues and in small blood vessels such as in the kidneys.

MGUS: **M**onoclonal **G**ammopathy of **U**ndetermined **S**ignificance is asymptomatic myeloma. It should be observed rather than treated.

Treatment

Commonly used regimens for initial therapy include bisphosphonates (drugs that counter the ill effects of MM on the bones), steroids such as dexamethasone, combination regimens such as VAD (vincristine, doxorubicin and dexamethasone) and alkylating agents such as melphalan.

Stem cell transplantation is performed to replace bone marrow cells after a patient receives high-dose chemotherapy, which destroys cancerous cells and normal cells alike. This approach improves survival, but is not curative since 90% of patients ultimately relapse. It may take three months to a year to recover from an autologous transplant, one that uses cells taken from the patient's own bone marrow.

Newer treatments include Velcade, thalidomide and Revlimid, alone and in combination, for newly diagnosed and for relapsed patients. (See previous page.) Doxil, fat bubbles called liposomes that contain doxorubicin, a drug that has been used to treat cancer for over 20 years. Doxil is being studied in combination with Velcade, thalidomide and other drugs. And Skeletal Targeted Radiotherapy (STR™) is designed to be used in combination with high-dose chemotherapy producing a direct therapeutic effect on the tumor sites in the bone plus a general bone-marrow effect.

"Until there is a cure... There is the IMF."

Additional information can be found at www.myeloma.org.

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