

## Multiple Myeloma and related illnesses

### What is multiple myeloma (MM)?

Multiple myeloma is a cancer of a type of white blood cell that makes antibodies, called plasma cells. All blood is made in the bone marrow where blood cells come from stem cells. These cancerous white blood cells can crowd out the normal blood cells in the bone marrow leading to anemia and damage and eat away at the bone leading to fractures and high blood calcium levels. These cancerous multiple myeloma cells are not able to fight infection but do make excessive non-functional antibody (M protein), which leads to blood thickening and kidney damage.

### What are other kinds of plasma cell cancers?

- **Monoclonal gammopathy of undetermined significance (MGUS)** In this type of plasma cell cancer, less than 10% of the bone marrow is made up of abnormal plasma cells and there is no deleterious effects on body. The abnormal plasma cells make M protein, which is sometimes found during a routine blood or urine test. In most patients, the amount of M protein stays the same and there are no symptoms, or health problems.
- **Plasmacytoma** In this type of plasma cell neoplasm, the abnormal plasma cells (myeloma cells) are in one place and form a tumor called a plasmacytoma. In isolated plasmacytoma of bone, one plasma cell tumor is found in the bone, less than 10% of the bone marrow is made up of plasma cells, and there are no other signs of cancer. Plasmacytoma of the bone may cause fracture and often leads to multiple myeloma. Plasmacytoma of soft tissue is commonly found in tissues of the throat, tonsil, and paranasal sinuses, and may press on surrounding areas causing symptoms.
- **Multiple myeloma** In multiple myeloma, abnormal plasma cells (myeloma cells) build up in the bone marrow and form tumors in bones of the body. These tumors may keep the bone marrow from making enough healthy blood cells. As the number of myeloma cells increases, fewer red blood cells, white blood cells, and platelets are made. The myeloma cells also damage and weaken the bone, leading to fracture and accompanied by fever.

### How are plasma cell neoplasms diagnosed?

- Physical exam and history
- Blood and urine immunoglobulin studies
- Bone marrow aspiration and biopsy
- Skeletal bone survey:
- Complete blood count (CBC) with differential
- Blood chemistry studies
- Twenty-four-hour urine test
- MRI (magnetic resonance imaging)
- PET-CT scan

## **What affects the likelihood of cure?**

The prognosis (chance of recovery) depends on the following:

- The type of plasma cell neoplasm.
- The stage of the disease.
- Whether a certain immunoglobulin (antibody) is present.
- Whether there are certain genetic changes.
- Whether the kidney is damaged.
- Whether the cancer responds to initial treatment or recurs (comes back).

## **What treatment is offered?**

Different types of treatments are available for patients with plasma cell neoplasms.

- **Steroids**
- **Targeted therapy**

Targeted therapy is a treatment that uses drugs or other substances to identify and attack specific cancer cells without harming normal cells. Several types of targeted therapy may be used to treat multiple myeloma and other plasma cell neoplasms.

- Proteasome inhibitor therapy
  - Immunomodulators
  - Monoclonal antibody therapy
  - Histone deacetylase (HDAC) inhibitor therapy
- **Chemotherapy**
  - **High-dose chemotherapy with stem cell transplant**
  - **Biologic therapy**
  - **Supportive care to lessen the problems caused by the disease or its treatment which includes:**
    - Radiation therapy: Radiation therapy is given for bone lesions of the spine.
    - Bisphosphonate therapy: Bisphosphonate therapy is given to slow bone loss and reduce bone pain.