



Acute Myeloid Leukemia

What is the bone marrow?

The bone marrow is the factory that produces different cells that form blood. It is the soft inner part of some bones, such as the skull, shoulder blades, ribs, pelvis, and bones in the spine. Immature cells are produced in the bone marrow. These are called the blood stem cells. With time and under the effect of maturation factors, these cells become mature blood cells. Broadly there are of two types –myeloid stem cell or a lymphoid stem cell.

A myeloid stem cell goes on to form one of three types of mature blood cells:

- Red blood cells that carry oxygen and other substances around the body.
- Platelets that help stop bleeding.
- White blood cells (granulocyte) that fight infection and disease. A myeloblast is the immature form of the granulocyte.

A lymphoid stem cell becomes a lymphoblast cell (immature cell) and then one of three types of lymphocytes (white blood cells):

- B lymphocytes that make antibodies to help fight infection.
- T lymphocytes that help B lymphocytes make the antibodies that help fight infection.
- Natural killer cells that attack cancer cells and viruses.

What is acute myeloid leukemia?

Acute myeloid leukemia (AML) is an overproduction of myeloblasts in the bone marrow. Overcrowding of the marrow with

these cells prevents production of normal cells. These cells spill over in the blood and spread to other organs in the body.

Acute myeloid leukemia is also called acute myelocytic, myelogenous or granulocytic leukemia. It progresses quickly and can be fatal in few months, if not treated.

What are the risk factors for acute myeloid leukemia?

The exact cause of AML is not known. Certain factors have been identified that increase the risk, which include:

- Age 65 years and older
 - Male gender
 - Chemotherapy
 - Exposure to radiation
 - Exposure to certain chemicals such as benzene
 - Smoking
 - Other blood disorders
 - Myelodysplastic syndrome
 - Myeloproliferative neoplasms
 - Polycythemia vera
 - Thrombocythemia
 - Genetic disorders
 - Down's Syndrome
 - Bloom Syndrome
 - Fanconi's anaemia
 - Kostmann syndrome
 - Trisomy 8
 - Drugs
 - Chloramphenicol
 - Chloroquine
 - Methoxypsoralen
 - Having a brother or sister with AML
- Some unproven risk factors include:
- Exposure to electromagnetic fields (such



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- as living near power lines or using cell phones)
- Workplace exposure to diesel, gasoline, pesticides, and certain other chemicals
- Exposure to herbicides or pesticides

What are the symptoms of acute myeloid leukemia?

Most symptoms in AML are caused by bone marrow failure. Symptoms include:

- Pallor
- Fatigue
- Shortness of breath
- Bruising
- Bleeding
- Fever
- Frequent infections
- Bone and joint pain
- Swollen lymph nodes
- Abdominal pain caused by enlarged liver and/or spleen
- Unexplained weight loss
- Loss of appetite
- Bleeding gums

ALL can present with symptoms of spread to brain, spinal cord, testis, chest cavity, skin, eyes, kidneys, etc.

How is acute myeloid leukemia diagnosed?

The following tests and procedures may be used to diagnose childhood AML and its spread to various parts of body:

- Complete blood count (CBC) and blood cell exam (peripheral blood smear)

- Blood chemistry and coagulation tests to detect liver and kidneys problems caused by spread of disease
- Bone marrow aspiration and biopsy
- Lumbar puncture for spread to brain and spinal cord
- Imaging tests for infection and spread to parts of body
 - Chest x-ray
 - CT scan
 - MRI
 - Ultrasound

What is the treatment for acute myeloid leukemia?

In general, treatment falls into two phases:

- Remission induction therapy
- Consolidation therapy

Initial goal is to eradicate the disease rapidly and induce complete remission. Then strategies are evolved to prolong survival and establish cure.

The types of therapy used include:

- Chemotherapy
- Other drug therapy
- Radiation therapy (rarely)
- Bone marrow transplant (BMT)
- Clinical trials of new drugs