

Oncology

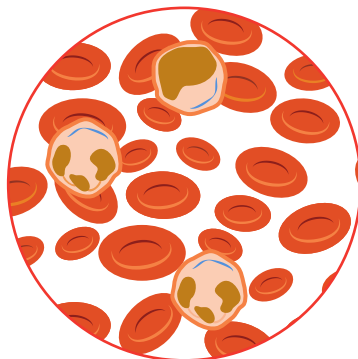


An Interactive Guide to Acute Myeloid Leukemia (AML)

About Acute Myeloid Leukemia (AML)

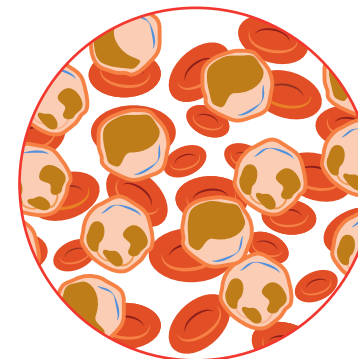
AML first develops in the bone marrow, where leukemia cells accumulate and ultimately block the way for healthy blood cells to develop.¹

Healthy blood cell



Healthy cells are necessary as they carry oxygen to all tissues throughout the body and fight against infection/disease.¹

Blood cells in AML



AML interferes with the development of healthy blood cells.¹

AML can quickly spread into the bloodstream, causing infections, anemia or bleeding. Due to the rapid progression of the disease, if AML is not treated quickly it can result in death within months.³

Prevalence of AML

AML across the globe

AML has the lowest survival rate among leukemias that occur in adults.²

It is estimated that about
26.6% of patients
will be alive **5 years** after diagnosis⁴



Of approximately **350,000 people**
with leukemias worldwide,⁵ about

25% have **AML**²

The highest incidence rates occur in the **United States,**
Europe and **Australia**²



An estimated **21,380** people in the United
States will be newly diagnosed with AML in 2017⁶



Role of Genetic Mutations

AML can be driven by genetic mutations

Researchers have made recent progress in understanding the prevalence of certain genetic mutations in AML, and their understanding continues to evolve.¹⁰

Learn about a few of the common genetic mutations in AML

Other genetic mutations that may play a role in AML include: CEBPA (9%), TET2 (8%), WT1 (8%), IDH2 (8%), IDH1 (7%), KIT (6%).¹⁰



The Patient Journey

Because of the extremely rapid progression of the disease, treatment is started as soon as possible after diagnosis.¹

Tailoring treatment

Doctors work with patients to create a suitable treatment pathway. This depends upon:³

- Disease-specific factors such as genetic subtype
- Patient-specific factors such as health condition, age and ability to tolerate chemotherapy

The treatment pathway



Diagnosis

An AML diagnosis is made based on:¹

- Medical history and physical examination
- Blood samples, known as a complete blood count (CBC)
- Bone marrow biopsy
- Cytogenetic analysis and molecular markers



Treatment

Patients are admitted to the hospital as soon as possible after diagnosis and treatment is begun immediately. Treatment aims to remove any cancer cells.³

Due to the low number of white blood cells and the risk for infection, patients remain in the hospital for around three weeks.¹⁴

A bone marrow sample is taken 7-10 days after start of treatment to judge efficacy. If remission has not been achieved, another course of treatment will be given. If remission is achieved, further treatment may be given to kill any remaining cancer cells and to help prevent relapse from occurring.⁹



Relapse

A relapse can happen at any stage of treatment. Relapses are identified with the reappearance of leukemic blasts (immature white blood cells) in the blood or the finding of more than 5% of blasts in the bone marrow.⁹

There are several treatment options for patients in relapse, including clinical trials.⁹



Remission and surveillance

Once in remission, regular appointments will be scheduled to monitor the disease.

In the first 2 years following remission:⁹

- CBCs are taken every 1-3 months
- Bone marrow biopsies only taken if abnormal cells detected

After 2 years:⁹

- CBCs taken every 3-6 months
- Bone marrow biopsies only taken if abnormal cells detected
- Risk of relapse decreases significantly at this point



Supportive care

Some patients may decide against further treatment for AML and instead focus on treating symptoms or complications that arise and keeping as comfortable as possible.⁹

The Disease Burden

The impact of disease for patients and loved ones

An emotional and psychologically difficult journey

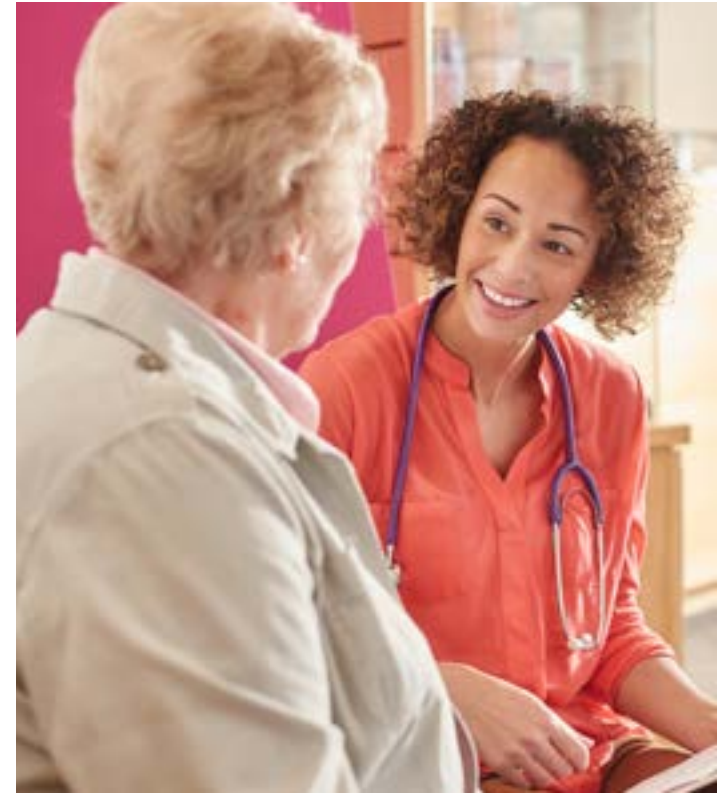
AML diagnosis impacts many aspects of a patient's life throughout diagnosis, treatment and recovery.



The Economic Burden

Despite limited data, existing figures show the economic burden of AML to be high

Final costs can depend on the selected treatment, length of hospital stay and adverse events, as well as insurance provider or region.^{22,23}



Cost drivers²⁴⁻²⁶

- Hospital reimbursement
- Physician payments
- Outpatient hospital/clinic payments
- Home health care payments

Indirect costs^{23,27}

- Time off work
- Time spent in the hospital
- Transportation costs
- Home care
- Child care
- Potential costs associated with relapse
- Caregiver burden

Glossary

AML – acute myeloid leukemia

A rare form of leukemia

CBC – complete blood count

Blood test used to test for and monitor leukemia, measures several components of the blood, including red blood cells, white blood cells, hemoglobin and platelets

CBF AML

Core binding factor AML, a specific subtype of AML

CEBPA

CCAAT-enhancer binding protein alpha – a gene implicated in AML development

CN-AML

Cytogenetically normal AML, a subtype of AML

DNMT3A

DNA (cytosine-5)-methyltransferase 3A – a gene implicated in AML development

FLT3 – Fms-like tyrosine kinase 3

A gene implicated in AML development

Hemoglobin

The oxygen-carrying protein in red blood cells

IDH – isocitrate dehydrogenase

A gene implicated in AML development

KIT

A gene implicated in AML development

Myeloblast

An immature white blood cell

NPM1 – Nucleophosmin

A gene implicated in AML development

Platelets

A component of blood, which forms blood clots to stop bleeding

Red blood cells

A component of blood, which carries oxygen and other substances to all tissues of the body

White blood cells

A component of blood, which fights infection and disease

References

- 1 National Institute of Health (NIH) National Cancer Institute (NCI). Adult Acute Myeloid Leukemia Treatment (PDQ®) <http://www.cancer.gov/types/leukemia/patient/adult-aml-treatment-pdq>. Accessed February 9, 2017.
- 2 Deschler B and Lübbert M. Acute myeloid leukemia: epidemiology and etiology. *Cancer*. 2006;107(9):2009-2107.
- 3 American Cancer Society. Leukemia—Acute Myeloid (Myelogenous) <http://www.cancer.org/acs/groups/cid/documents/webcontent/003110-pdf.pdf>. Accessed February 9, 2017.
- 4 NIH NCI SEER Stat Fact Sheets: Acute Myeloid Leukemia (AML). <http://seer.cancer.gov/statfacts/html/amyl.html>. Accessed February 9, 2017.
- 5 Union for International Cancer Control. 2014. Acute Myelogenous Leukemia and Acute Promyelocytic Leukemia. http://www.who.int/selection_medicines/committees/expert/20/applications/AML_APL.pdf?ua=1ble. Accessed February 9, 2017.
- 6 Siegel RL, Miller KD, Jemal A. Cancer statistics, 2017. *CA Cancer J Clin*. 2017;67:7–30.
- 7 NIH National Cancer Institute. What is a gene? <https://ghr.nlm.nih.gov/primer/basics/gene>. Accessed February 9, 2017.
- 8 NIH National Cancer Institute. What is a gene mutation and how do mutations occur? <https://ghr.nlm.nih.gov/primer/mutationsanddisorders/genemutation>. Accessed February 9, 2017.
- 9 NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) Version 2.2016. Acute Myeloid Leukemia. http://www.nccn.org/professionals/physician_gls/pdf/aml.pdf. Accessed February 9, 2017.
- 10 Patel JP, Gönen M, Figueroa ME, et al. Prognostic relevance of integrated genetic profiling in acute myeloid leukemia. *N Engl J Med*. 2012; 22;366(12):1079-1089.
- 11 Bowen DT, Frew ME, Hills R, et al. RAS mutation in acute myeloid leukemia is associated with distinct cytogenetic subgroups but does not influence outcome in patients younger than 60 years. *Blood*. 2005;106:2113-2119.
- 12 Gulley ML, Shea TC and Fedoriw Y. Genetic Tests To Evaluate Prognosis and Predict Therapeutic Response in Acute Myeloid Leukemia. *J Mol Diagn*. 2010; 12(1): 3–16.
- 13 Leukemia and Lymphoma Society. Acute Myeloid Leukemia Treatment. <https://www.lls.org/leukemia/acute-myeloid-leukemia/treatment>. Accessed February 9, 2017.
- 14 Cancer.net. Leukemia - Acute Myeloid - AML: Treatment Options. <http://www.cancer.net/cancer-types/leukemia-acute-myeloid-aml/treatment-options>. Accessed February 9, 2017.
- 15 Helwick C. Acute Myeloid Leukemia: Understanding the Patient's Experience. <http://www.theoncologypharmacist.com/top-issues/2016-issues/may-2016-vol-9-no-2/16761-acute-myeloid-leukemia-understanding-the-patient-s-experience-top>. Accessed February 9, 2017.
- 16 LeBlanc T W, Fish LJ, Bloom CT, et al. Patient Experiences of Acute Myeloid Leukemia (AML): A Qualitative Study about Diagnosis, Illness Understanding, and Treatment Decision-Making. *Blood*. 2015. 126:2119.
- 17 Bevans MF and Sternberg EM. Caregiving Burden, Stress, and Health Effects Among Family Caregivers of Adult Cancer Patients. *JAMA*. 2012 January 25; 307(4): 398–403.
- 18 Cancer.net. Family Life. <http://www.cancer.net/coping-with-cancer/talking-with-family-and-friends/family-life>. Accessed February 9, 2017.
- 19 American Cancer Society. Case Study: When You Care for Someone with Cancer. <http://www.cancer.org/cancer/news/casestudy-when-you-care-for-someone-with-cancer>. Accessed February 9, 2017.
- 20 NCI. Facing Forward: Life After Cancer. <https://www.cancer.gov/publications/patient-education/life-after-treatment.pdf>. Accessed February 9, 2017.
- 21 Cancer.net. How Caregivers Can Take Care of Themselves. <http://www.cancer.net/coping-with-cancer/caring-loved-one/how-caregivers-can-take-care-themselves>. Accessed February 9, 2017.
- 22 Mahmoud D, Skikne BS, Kucmin-Bemelmans I, et al. Overall Economic Burden of Total Treatment Costs in Acute Myeloid Leukemia Throughout the Course of the Disease. *Blood*. 2012 120:3614.
- 23 Yabroff KR, Lund J, Kepka D, et al. Economic Burden of Cancer in the US: Estimates, Projections, and Future Research. *Cancer Epidemiol Biomarkers Prev*. 2011; 20(10): 2006–2014.
- 24 Redaelli A, Botteman MF, Stephens JM, et al. Economic burden of acute myeloid leukemia: a literature review. *Cancer Treat Rev*. 2004;30(3):237-247.
- 25 Zeidan AM, Mahmoud D, Kucmin-Bemelmans IT, et al. Economic burden associated with acute myeloid leukemia treatment. *Expert Rev Hematol*. 2016;9(1):79-89.
- 26 Menzin J, Lang K, Earle CC, et al. The outcomes and costs of acute myeloid leukemia among the elderly. *Arch Intern Med*. 2002;162(14):1597-1603.
- 27 CancerCare. A Helping Hand: The Resource for People with Cancer. https://media.cancercare.org/publications/original/178-helping_hand.pdf?1442411382. Accessed February 9, 2017.