About Chronic Myelomonocytic Leukemia

Get an overview of chronic myelomonocytic leukemia and the latest key statistics in the US.

Overview of CMML

If you have been diagnosed with chronic myelomonocytic leukemia or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- What Is Chronic Myelomonocytic Leukemia?

Research and Statistics

See the latest estimates for new cases of chronic myelomonocytic leukemia in the US and what research is currently being done.

- Key Statistics About Chronic Myelomonocytic Leukemia
- What's New in Chronic Myelomonocytic Leukemia Research and Treatment?

What Is Chronic Myelomonocytic Leukemia?

Chronic myelomonocytic leukemia (CMML) is at type of cancer that starts in blood-forming cells in the bone marrow and invades the blood.

What Is Cancer? [1]

Cancer starts when cells in the body begin to grow out of control. Cells in nearly any part of the body can become cancer cells. Learn more here.

Normal bone marrow

Bone marrow is found inside certain bones such as the skull, ribs, pelvis, and spine. It's made up of blood-forming cells, fat cells, and supporting tissues that help the blood-forming cells grow. A small fraction of the blood-forming cells are a special type of cell known as **stem cells**. Stem cells are needed to make new cells. When a stem cell divides, it makes 2 cells: one cell that stays a stem cell and another cell that can keep changing and dividing to make blood cells.

There are 3 types of blood cells: red blood cells, white blood cells, and platelets.

Red blood cells pick up oxygen in the lungs and carry it to the rest of the body. These cells also bring carbon dioxide back to the lungs. Having too few red blood cells is called anemia. People with anemia can look pale and feel tired and weak. Severe anemia can cause shortness of breath.

White blood cells (also called *leukocytes*) are important in fighting infection.

- **Lymphocytes** are immune cells in the bone marrow, the blood, and in lymph nodes[2]. Some kinds of lymphocytes make the antibodies that help your body fight germs. Other kinds directly kill invading germs by making toxic substances that damage the cells.
- **Granulocytes** are white blood cells that destroy bacteria. They contain granules that are made up of enzymes and other substances which can destroy germs that cause infections. In the bone marrow, granulocytes develop from young cells called myeloblasts. The most common type of granulocyte is the neutrophil; which is crucial in fighting bacteria. Other types of granulocytes arebasophils, and eosinophils. When the number of neutrophils in the blood is low, it is called **neutropenia**. This can lead to severe infections.
- **Monocytes** are related to the granulocyte family. They also help protect you

against bacteria. The early cells in the bone marrow that turn into monocytes are called monoblasts. When monocytes leave your bloodstream and go into tissue, they become **macrophages**. Macrophages can destroy germs by surrounding and digesting them. They're also important in helping lymphocytes recognize germs and start making antibodies to fight them.

Platelets are thought of as a type of blood cell, but they're really small pieces of a cell. They start as a large cell in the bone marrow called the megakaryocyte. Pieces of this cell break off and enter your bloodstream as platelets, which you need for your blood to clot. Platelets plug up damaged areas of blood vessels caused by cuts or bruises. If you have a shortage of platelets (a condition called thrombocytopenia) you can bleed and bruise a lot.

Features of chronic myelomonocytic leukemia

- People with CMML may have shortages of some blood cells, but a main problem is **too many monocytes** (at least 500 per mm^3). Often, the monocyte count is much higher, causing their total white blood cell count to become very high as well.
- Usually there are some very early forms of blood cells, called **blasts**, in the bone marrow. The amount of blasts in CMML is below 20%.
- Many people with CMML have enlarged spleens (an organ that lies just below the left rib cage).
- About 15% to 30% of people with CMML go on to develop acute myeloid leukemia[3].
- The DNA inside the abnormal cells does not have certain changes in the genes called *BCR/ABL* (Philadelphia chromosome), or some other genes. For more information about these gene changes, see Tests for Chronic Myelomonocytic Leukemia[4].

Since CMML has features of both a myelodysplastic syndrome[5] and myeloproliferative neoplasm, experts created a new category for it: **myelodysplastic/myeloproliferative neoplasm** (myelo -- bone marrow, proliferative -- excessive growth, dysplastic -- abnormal looking).CMML is the most common disease in this group. Much less common diseases in this group are atypical chronic myeloid leukemia (aCML) and juvenile myelomonocytic leukemia (JMML). All of these diseases produce a lot of abnormal blood cells.

Hyperlinks

1. www.cancer.org/cancer/understanding-cancer/what-is-cancer.html
2. www.cancer.org/cancer/diagnosis-staging/lymph-nodes-and-cancer.html
3. www.cancer.org/cancer/types/acute-myeloid-leukemia.html
4. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/detection-diagnosis-staging/how-diagnosed.html
5. www.cancer.org/cancer/types/myelodysplastic-syndrome.html

References

National Cancer Institute. Myelodysplastic/Myeloproliferative Neoplasms Treatment (PDQ) - Patient Version. 2023. Accessed at https://www.cancer.gov/types/myeloproliferative/patient/mds-mpd-treatment-pdq on May 20, 2024.

Padron E, Gurbuxani S. Chronic myelomonocytic leukemia: Clinical features, evaluation, and diagnosis. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/chronic-myelomonocytic-leukemia-clinical-features-evaluation-and-diagnosis on May 20, 2024.

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Key Statistics About Chronic Myelomonocytic Leukemia

Chronic myelomonocytic leukemia (CMML) is rare. This disease is very rare in young people; it occurs most often in older people. About 1 or 2 out of 100,000 people over the

age of 60 develop CMML each year.

CMML occurs more often in men than in women.

Visit the American Cancer Society's Cancer Statistics Center[1] for more key statistics.

Hyperlinks

1. cancerstatisticscenter.cancer.org/

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What's New in Chronic Myelomonocytic Leukemia Research and Treatment?

Research into the causes[1], diagnosis[2], andtreatment[3] of chronic myelomonocytic leukemia (CMML) is being done at many cancer research centers. CMML has been hard to study, because it isn't common, and because it's taken researchers many years to determine what makes it different from other blood diseases. But scientists continue to make progress in understanding this disorder.

- Genetics
- Chemotherapy and other drugs
- Stem cell transplant

Genetics

Researchers are learning more about which changes in a person's DNA (the substance that makes up our genes[4]) can cause normal bone marrow cells to develop into leukemia cells. Studies have found that changes in the structure or activity of certain genes in CMML cells may help predict a person's outcome and how likely they are to go on to develop acute leukemia. Researchers are also hoping that finding some of the gene changes in CMML cells might lead to treatments that target these changes (see below).

Chemotherapy and other drugs

Studies are in progress to find which chemotherapy drugs can help treat CMML, while trying to limit side effects. New drugs are continually being developed and tested.

As researchers have learned more about what makes cancer cells different from normal cells, they've developed drugs that target these differences. Studies are now looking at some of these targeted therapies[5] to treat CMML. These drugs target things like specific cell signaling pathways to shut down CMML cell growth.

Stem cell transplant

Scientists continue to refine stem cell transplants[6] so that they work better and cause fewer problems. They are also looking at which patients will benefit the most and how newer transplant methods might be used to treat CMML.

Hyperlinks

1. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/causes-risks-prevention/what-causes.html
2. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/detection-diagnosis-staging/how-diagnosed.html
3. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/treating.html
4. www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html
5. www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html
6. www.cancer.org/cancer/managing-cancer/treatment-types/stem-cell-

transplant.html

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