Chronic Myelomonocytic Leukemia Early Detection, Diagnosis, and Staging

Know the signs and symptoms of chronic myelomonocytic leukemia. Find out how CMML is tested for, diagnosed, and staged.

Detection and Diagnosis

Catching cancer early often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that is not always the case.

- Signs and Symptoms of Chronic Myelomonocytic Leukemia
- How Is Chronic Myelomonocytic Leukemia Diagnosed?

Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and anticipated response to treatment.

- How Is Chronic Myelomonocytic Leukemia Staged?
- Survival Rates for Chronic Myelomonocytic Leukemia

Questions to Ask About CMML

Here are some questions you can ask your cancer care team to help you better understand your CMML diagnosis and treatment options.

- Questions to Ask Your Doctor About Chronic Myelomonocytic Leukemia

Signs and Symptoms of Chronic Myelomonocytic Leukemia

Overall, the signs and symptoms of leukemia can affect men or women and do not differ by sex or gender.

The most common sign of chronic myelomonocytic leukemia (CMML) is having too many monocytes (seen on a blood test).

Having too many monocytes also causes many of the symptoms of CMML. These monocytes can settle in the spleen or liver, enlarging these organs. An enlarged spleen (called splenomegaly) can cause pain in the upper left part of the belly (abdomen). It can also cause people to notice they feel full too fast when they eat. If the liver gets too big (called hepatomegaly), it causes discomfort in the upper right part of the abdomen.

Low numbers of other types of blood cells[1] cause many of the signs and symptoms of CMML:

- A shortage of red blood cells (anemia) can lead to feeling very tired, with shortness of breath and pale skin.
- Not having enough normal white blood cells (leukopenia) can lead to frequent or severe infections[2].
- A shortage of blood platelets (thrombocytopenia) can lead to easy bruising and bleeding. Some people notice frequent or severe nosebleeds or bleeding from their gums.

Other symptoms can include weight loss, fever, and loss of appetite. Of course, many of these problems are caused more often by something other than cancer. If you're having symptoms, you should see a doctor so a cause can be found.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts.html

2. www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/infections.html
3. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/references.html

References

See all references for Chronic Myelomonocytic Leukemia

Myelodysplastic/Myeloproliferative Neoplasms Treatment (PDQ) - Patient Version. August 12, 2015. Accessed on October 4, 2017 at www.cancer.gov/types/myeloproliferative/patient/mds-mpd-treatment-pdq#section/_278.

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How Is Chronic Myelomonocytic Leukemia Diagnosed?

- Blood tests
- Bone marrow tests

If signs and symptoms suggest you may have chronic myelomonocytic leukemia (CMML), the doctors will look at cells from your blood and bone marrow to confirm this diagnosis.

Blood tests

The complete blood count[1] (CBC) measures different cells in the blood, such as the red blood cells, the white blood cells, and the platelets. The CBC is often done with a differential count (or “diff”), which is a count of the different types of white blood cells in the blood sample. In a blood smear, some of the blood is put on a slide to see how the cells look under the microscope.

People with CMML have higher numbers of monocytes, (at least 1,000 per mm^3). Sometimes they have low numbers of other white blood cells. They may have shortages of red blood cells and blood platelets, as well.

Some patients have a small number of monoblasts in the blood. Monoblasts are the early, immature cells that grow and divide to make mature monocytes. Normally, these cells are only found in the bone marrow. It's never normal to see blasts in the blood, and it's often a sign of a bone marrow problem.

Blood cells from CMML patients may also have certain changes in size, shape, or other features that can be seen under the microscope. Blood abnormalities may suggest CMML, but an exact diagnosis cannot be made without looking at and testing cells taken from the bone marrow.

Other blood tests may be done to check for other possible causes of low blood counts, such as low levels of vitamin B12 and folate. Tests may also be done to look for other causes of a high white blood cell count, such as an infection.

Bone marrow tests

Samples of your bone marrow are taken by bone marrow aspiration and biopsy for testing. The samples are usually taken from the back of the pelvic (hip) bone. These tests are used to diagnosis and classify the type of blood cancer you have. They may be repeated later to see if treatment is working or to see if the CMML is transforming into an acute leukemia.

For bone marrow aspiration, you lie flat on a table (either on your side or on your belly). After cleaning the skin over the hip, the surface of the bone is numbed with local anesthetic. A very thin needle is used to put in the numbing drug, which may cause a brief stinging or burning sensation. A long, hollow needle is then put into the bone and a syringe is used to suck out a small amount of liquid bone marrow (about 1 teaspoon). Even with the anesthetic, most patients still have some brief pain when the marrow is removed.

A bone marrow biopsy is usually done right after the aspiration. A small core of bone and marrow (about 1/16 inch in diameter and 1/2 inch long) is removed with a wider needle that's twisted as it's pushed into the hip bone. The biopsy may also cause some brief pain. Once the biopsy is done, pressure will be held to help prevent bleeding and bruising.

A pathologist(a doctor specializing in the diagnosis of diseases using laboratory tests)

examines the bone marrow samples under a microscope. A hematologist(a doctor specializing in medical treatment of diseases of the blood and blood-forming tissues) or an oncologist(a doctor specializing in medical treatment of cancer) usually looks at the samples too.

Looking at the cells in the bone marrow

The doctors will look at the types and number of blood-forming cells in the bone marrow aspirate and biopsy. They will also check to see if the bone marrow shows signs of infections, cancer cells, or other disorders. They will examine the size and shape of the cells and determine whether the red cells contain iron particles or the other cells contain granules (microscopic collections of enzymes and other chemicals that help white blood cells to fight infections).

Measuring blasts

Tests will be done to measure the percentage of marrow cells that are blasts. This is very important. Blasts are very early (immature) cells that are made by bone marrow stem cells. Over time, blasts mature into normal blood cells. But in CMML, some of the blasts do not mature properly, so there may be too many blasts and not enough mature cells. **For a diagnosis of CMML, there must be less than 20% blasts in the bone marrow.** A patient who has more than 20% blasts in the bone marrow has acute leukemia[2].

Cytogenetic tests

This test looks at the chromosomes inside the cells. DNA in human cells is packed into chromosomes. Each cell should have 46 chromosomes (23 pairs). Chromosome changes or abnormalities are fairly common in CMML. Sometimes pieces of chromosomes or even whole chromosomes are missing. CMML cells may also have extra copies of all or part of some chromosomes. Chromosome translocations may also be seen. This is where parts of chromosomes trade places with each other.

Chromosome testing can also help the doctors be sure that the problem isn't a different leukemia, called chronic myeloid leukemia or CML[3]. The leukemia cells in CML often contain an abnormal chromosome caused by a certain translocation. This is called the ***Philadelphia chromosome or BCR/ABL fusion***. If the Philadelphia chromosome is present, the diagnosis is CML, not CMML. CMML also does not have changes in certain genes, called PDGFRA and PDGFRB. If these changes are present the problem might be a different myeloproliferative disorder.

Cytogenetic testing can take several weeks because the bone marrow cells need time to grow in laboratory dishes before the chromosomes can be seen with a microscope. The results of cytogenetic testing are written in a way that describes which chromosome changes are present. For instance:

- **A minus sign (-) or the abbreviation "del" is used to mean a deletion.** So, if a copy of chromosome 7 is missing, it can be written as -7 or del(7). Often, only a part of the chromosome is lost. There are 2 parts to a chromosome, called p and q. So the loss of the q part of chromosome 20 is called 20q- or del(20q).
- **A plus sign (+) is used when there is an extra copy of all or part of a chromosome**. For example, +8 means that chromosome 8 has been duplicated and too many copies of it are in the cell.
- **The letter "t" is used to indicate a translocation, which is when a piece of one chromosome breaks off and becomes part of another chromosome.**

Other tests

These are other bone marrow tests that help the doctor diagnose CMML and rule out other blood diseases:

- Immunocytochemistry[4]. This testing is helpful in distinguishing CMML from other types of leukemia and from other diseases.
- Flow cytometry[5]. This test isn't needed for all patients, but it can be very helpful in diagnosing leukemia and lymphoma.
- Molecular genetic tests[6]. These tests are not needed to diagnose CMML, but they may be used in some cases

These tests can be done on cells besides bone marrow cells, such as cells from the blood.

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html
2. www.cancer.org/cancer/types/leukemia.html

3. www.cancer.org/cancer/types/chronic-myeloid-leukemia.html
4. www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests/testing-biopsy-and-cytology-samples-for-cancer/special-tests.html
5. www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests/testing-biopsy-and-cytology-samples-for-cancer/special-tests.html
6. www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests/testing-biopsy-and-cytology-samples-for-cancer/special-tests.html
7. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/references.html

References

See all references for Chronic Myelomonocytic Leukemia

National Cancer Institute. Myelodysplastic/Myeloproliferative Neoplasms Treatment (PDQ) - Patient Version. August 12, 2015.

Nazha A, Prebet T, Gore S, Zeidan AM. Chronic myelomonocytic leukemia: Are we finally solving the identity crisis? *Blood Rev*. 2016;30(5):381-388.

Patnaik MM, Tefferi A. Chronic myelomonocytic leukemia: 2016 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2016;91(6):631-642.

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How Is Chronic Myelomonocytic Leukemia Staged?

Doctors often group cancers into different stages based on the size of the tumor and how far the cancer has spread from the original site in the body. The stage of a cancer can help predict the outlook for a cancer. Often, the stage of a cancer is used to decide which treatment is needed.

Chronic myelomonocytic leukemia (CMML) is a disease of the bone marrow. It cannot be staged by looking at the size of a tumor like some other cancers. Instead, CMML is split into 2 groups based on cell counts in the blood and bone marrow:

- **CMML-1:** Blasts make up less than 5% of white cells in the blood and less than 10% of the cells in the bone marrow.
- **CMML-2:** Blasts make up 5% to 20% of the white cells in the blood, or they make up 10% to 20% of the cells in the bone marrow.

Hyperlinks

1. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/references.html

References

See all references for Chronic Myelomonocytic Leukemia

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Survival Rates for Chronic Myelomonocytic Leukemia

There is more than one way to describe a person's likely prognosis (outlook). The statistics below talk about median survival. Median survival is the amount of time for half the patients in a group to die. This is a middle value -- half the patients live longer than this, and half do not live this long.

In order to get median survival estimates, doctors have to look at people who were treated several years ago. Improvements in treatment since then may result in a more favorable outlook for people now being diagnosed with chronic myelomonocytic leukemia (CMML).

Median survival estimates are based on previous outcomes of large numbers of people who had the disease, but they cannot predict what will happen in any particular person's case. Many other factors may affect a person's outlook, such as their age and overall health. Your doctor can tell you how the numbers below may apply to you, as they are familiar with the aspects of your particular situation.

Patients with CMML-1 tend to live longer than those with CMML-2. In one study of CMML patients diagnosed between 1975 and 2005, the median survival times with CMML-1 and CMML-2 were 20 months and 15 months, respectively. However, some patients lived much longer. About 20% of CMML-1 patients and about 10% of CMML-2 patients survived longer than 5 years. Also, patients with CMML-2 are more likely to go on to develop acute leukemia than patients with CMML-1. In the same study, 18% of CMML-1 patients and 63% of CMML-2 patients developed acute myeloid leukemia within 5 years of their CMML diagnosis.

In addition to the type of CMML, other factors may be helpful in predicting survival. These include blood cell counts, certain chromosome changes, and blood levels of LDH (lactate dehydrogenase).

Hyperlinks

1. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/references.html

References

See all references for Chronic Myelomonocytic Leukemia

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Questions to Ask Your Doctor About Chronic Myelomonocytic Leukemia

It is important to have frank, open, and honest discussions with your doctor about your condition. Your doctor and the rest of the health care team want to answer all of your questions. For instance, consider these questions:

- What are my treatment choices?
- Which treatment, if any, do you recommend, and why?
- Do the treatments you recommend have side effects?
- How can I help reduce the treatment side effects I might have?
- What is the outlook for my survival?
- Should I get a second opinion, and who do you recommend as an expert in this disease?

Hyperlinks

1. www.cancer.org/cancer/types/chronic-myelomonocytic-leukemia/references.html

References

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