

Chronic Myeloid Leukemia Risk Factor Information

This document gives a general overview of risk factors. The document covers:

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About Cancer and Risk Factors

Cancer is not just one disease.

Cancer is a group of over 100 different diseases. Cancer occurs when abnormal cells grow out of control and crowd out the normal cells. It can start anywhere in the body and can spread (“metastasize”) to other parts of the body. Cancer types are named for the original location in the body and the type of cell or tissue. Different types of cancer have different causes and risk factors.

Cancer can take a long time to develop.

The cause of cancer is sometimes related to events that happened many years ago. Most cancer types are thought to take anywhere from 10 to over 50 years to develop. A few types, such as leukemia or lymphoma, are thought to take less than 10 years.

A risk factor is anything that increases your chance of getting cancer.

Some risk factors can be controlled while others cannot. Risk factors can include:

- Hereditary conditions (e.g., genes passed down from parents)
- Medical conditions or treatments (e.g., a previous cancer diagnosis)
- Infections (e.g., human papilloma virus)
- Lifestyle factors (e.g., smoking cigarettes)
- Environmental exposures (e.g., certain air pollutants)

Most risk factors do not directly cause cancer.

A risk factor influences the development of cancer but usually does not directly cause cancer. Instead, a combination of risk factors likely drives cancer development. For example, genetic factors can make individuals more likely to get cancer when they are exposed to a cancer-causing chemical.

Environmental risk factors depend on how, how much, and how long you are exposed.

Your risk from exposure to certain chemicals or radiation depends on the type, extent, and duration of exposure. For example, inhaling a certain chemical may increase your risk of getting cancer. However, touching the same chemical may not. In addition, some substances may increase your risk only if you are exposed to high amounts over a long time.

It is difficult to identify the exact causes of cancer.

- Many cancers can develop due to random chance.
- Multiple risk factors can act in combination.
- Risk factors can change over time.
- Cancer might not develop or get diagnosed for a long time after an initiating event (such as exposure or random cell mutation).

Knowing your risk factors can help you make more informed choices.

Discuss your risk factors with your health care provider to make more informed decisions on lifestyle and health care.

About Chronic Myeloid Leukemia (CML)

In the United States, about 1 person in 526 will get CML in their lifetime.

The American Cancer Society estimates that 60,650 individuals will be diagnosed with leukemia in the United States in 2022. About 8,860 will be diagnosed with CML specifically.^{1,3,6} In Massachusetts, leukemia accounted for about 2.6% of all cancers diagnosed between 2013 and 2017.⁷

CML mainly affects adults.

CML is rare in children and teens.⁵ The risk of developing CML increases with age and almost half of CML diagnoses occur in people aged 65 and older.^{2,3} CML is slightly more common in males than females.³

The cancer cells of almost all people with CML have a genetic abnormality.

This abnormality, called the Philadelphia chromosome, occurs by chance after birth when a string of genetic material (called a chromosome) breaks off during cell division and attaches to another chromosome. The Philadelphia chromosome is not inherited.^{3, 6}

Types of Leukemia

Leukemia is a cancer of the bone marrow and blood.

Leukemia types are grouped according to the type of blood cell affected and how fast the disease progresses.

- “Lymphocytic” leukemias start in early forms of white blood cells called lymphocytes. “Myeloid” (or myelogenous) leukemias start from myeloid cells that normally form red blood cells, platelets, or white blood cells other than lymphocytes.
- “Acute” leukemias progress faster than “chronic” leukemias. Acute and chronic forms of leukemia have different approaches to diagnosis and treatment.^{3,6,8}

There are 4 main groups of leukemia:

- Acute myeloid leukemia (AML) - about 33%
- Chronic lymphocytic leukemia (CLL) - about 33%
- Chronic myeloid leukemia (CML) - about 15%
- Acute lymphocytic leukemia (ALL) – about 11%¹

There are also a few rare types, such as hairy cell leukemia, that make up the remaining 8% of leukemia diagnoses.⁴

Known Risk Factors

At present, little is known about risk factors for CML.

Environmental Exposures

Ionizing radiation:

Exposure to high-level ionizing radiation (e.g., survivors of atomic bombs or nuclear reactor accidents) is the only known environmental risk factor for CML.

Possible Risk Factors

Medical Conditions

Radiation treatment for a previous cancer:

It is not clear if radiation therapy or chemotherapy treatment given for other types of cancer increases the risk of developing CML later in life.^{2,6,8} The risk of developing CML or another leukemia after treatment may depend on how much radiation reached the bone marrow, how large the radiation dose was, and how much and how often the bone marrow was exposed.⁴

Other Risk Factors That Have Been Investigated

The risk of developing CML does not seem to be affected by smoking, diet, exposure to chemicals, or infections, nor does CML run in families.³

References / More Information

This information sheet should not be considered exhaustive. For more information on other possible risk factors and health effects being researched, please see the resources below. Much of the information contained in this summary has been taken directly from these sources. This material is provided for informational purposes only and should not be considered as medical advice. Consult your physician if you have questions regarding a specific medical problem or condition.

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