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Printed January 27, 2015 from <http://www.cancer.net/cancer-types/leukemia-acute-lymphocytic-all/subtypes-and-classification>

Leukemia - Acute Lymphocytic - ALL - Subtypes and Classification [1]

This section has been reviewed and approved by the [Cancer.Net Editorial Board](#) [2], 11/2014

ON THIS PAGE: You will learn about how doctors describe ALL. This is called subtype and classification. To see other pages, use the menu on the side of your screen.

To help plan treatment and predict prognosis, doctors divide ALL into subtypes and classify the disease based on the type of lymphocytes that are affected. For example, flow cytometry (see [Diagnosis](#) [3]) distinguishes between ALL involving T cells or B cells. Specific chromosomal or genetic changes in the cancer cells are used to help predict how well the disease will respond to treatment and may guide the treatment choices.

Subtypes include:

- Acute precursor B-cell (pre B-cell) lymphoblastic leukemia
- Acute B-cell lymphoblastic leukemia
- Precursor T-cell acute lymphoblastic leukemia
- Philadelphia chromosome positive (*BCR-ABL* fusion) acute lymphoblastic leukemia (see below)

About 5% of people with the B-cell type have a unique subtype called Burkitt leukemia or Burkitt lymphoma. ALL can also be described by what the cells look like when viewed with a microscope, called L1, L2, and L3, although this is less important than the results of the flow cytometry or cytogenetic tests.

Some patients have a type of leukemia called biphenotypic acute leukemia, which means the disease has characteristics of both ALL and [acute myeloid leukemia \(AML\)](#) [4]. This type of leukemia is often treated with the treatments used for ALL.

As described in [Diagnosis](#) [3], about 20% to 30% of adults with ALL have a genetic change or mutation called the Philadelphia chromosome, causing two genes, *BCR* and *ABL*, to become one fusion gene called *BCR-ABL*. This mutation is found only in the cancerous blood-forming cells, not in other organs of the body, and is not inherited. Therefore, there is no concern about an increased risk of ALL for other family members.

The *BCR-ABL* gene causes specific types of white blood cells called B lymphoblasts to grow out of control. It is important to test for the Philadelphia chromosome because it helps the doctor predict a patient's prognosis and recommend treatment.

ALL classification

In other types of cancer where a solid tumor forms, doctors agree on a set of stages that describe how big the tumor is and where it has spread. Because leukemia usually does not form a solid tumor and is found throughout the body when diagnosed, there is no formal staging system for ALL. Instead, there are general classifications used to describe ALL:

Newly diagnosed and untreated. A patient usually has decreased numbers of normal white blood cells, red blood cell, and platelets. However, some patients may have an increased number of white blood cells. Often there are many abnormal lymphoblasts in the blood. The bone marrow contains abnormal lymphoblasts, and the person usually is experiencing symptoms of ALL (listed in the [Symptoms and Signs](#) [5] section).

In remission. A patient has received treatment for ALL. The bone marrow contains less than 5% blasts, and the patient has no symptoms. The numbers of normal white blood cells, red blood cells, and platelets are normal.

Refractory. Refractory leukemia means that the disease has not responded to treatment.

Recurrent. Recurrent leukemia has come back after being in remission.

The subtype and classification of ALL will help the doctor recommend a treatment plan. The next section helps explain the treatment options for this type of leukemia. Use the menu on the side of your screen to select Treatment Options, or you can select another section, to continue reading this guide.

Links:

[1] <http://www.cancer.net/cancer-types/leukemia-acute-lymphocytic-all/subtypes-and-classification>

[2] <http://www.cancer.net/about-us>

[3] <http://www.cancer.net/node/19042>

[4] <http://www.cancer.net/node/31280>

[5] <http://www.cancer.net/node/19041>