

ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

Subtypes and Genomic Alterations



KNOW
ALL

What are ALL subtypes?

Based on the type of white blood cell (lymphocyte) affected, ALL is classified as either B-cell ALL or T-cell ALL. Additional subtypes are based on genetic abnormalities in the leukemia cells. The most common subtypes in adults and children include:

Adults:

BCR/ABL1 (Philadelphia-positive ALL):

Formed by the fusion of *BCR* and *ABL1* genes

Children:

ETV6/RUNX1: Formed by the fusion of *ETV6* and *RUNX1* genes

High hyperdiploidy: The leukemia cells have extra chromosomes

Other ALL subtypes include **hypodiploidy**, **iAMP21**, **BCR/ABL1**, **KMT2A**, **TCF3/PBX1**, **IGH/IL3**, **TCF3/HLF**, **DUX4**, **MEF2D**, **ZNF384**, **NUTM1**, **IC/MYC**, **PAX5alt**, and **PAX5 P.P80R**

Why are ALL subtypes important?

In order to better understand your treatment options, it is important to be aware of your ALL subtype; this will also help your healthcare provider select more targeted treatment options. Not all patients with ALL will receive the same treatment. Your choice of treatment will be influenced by many other factors, such as your age and how fit you are.

Identifying the genetic changes present in leukemia cells will help to further understand the disease.

What tests may I need?

Your blood and bone marrow samples will be tested for specific genetic changes. Tests could involve:

Karyotyping: Checks for changes in the structure or number of chromosomes

Fluorescence in situ hybridization (FISH): Checks for abnormalities in chromosomes and genes, some of which are too small to identify with karyotyping

Your healthcare provider can advise you on which tests are right for you.

Normally, a sample of blood or bone marrow will be taken to carry out these tests; the type of test being performed will determine which sample is needed.

If you could benefit from genetic testing, your healthcare provider will refer you to a clinic or hospital.

Once you have received your results, your healthcare provider will be able to answer any questions you have.

What questions should I ask my healthcare provider?

Which type of ALL do I have and what does this mean?

What factors are likely to affect my prognosis?

What type of testing might I undergo?

For more information, visit www.know-allleukemia.com/understanding-all/types

Resources: **KNOW ALL.** <https://know-allleukemia.com/>. **American Cancer Society.** Acute lymphocytic leukemia (ALL) subtypes and prognostic factors. <https://www.cancer.org/cancer/acute-lymphocytic-leukemia/detection-diagnosis-staging/how-classified.html>. Updated Oct 2018. Accessed Aug 2023. **Cancer Research UK.** Types. <https://www.cancerresearchuk.org/about-cancer/acute-lymphoblastic-leukaemia-all/types>. Updated May 2021. Accessed Aug 2023. **Leukemia & Lymphoma Society.** ALL subtypes. <https://www.lls.org/leukemia/acute-lymphoblastic-leukemia/diagnosis/all-subtypes>. Accessed Aug 2023. Alaggio R, Amador C, Anagnostopoulos I, et al. The 5th edition of the World Health Organization classification of haematolymphoid tumours: lymphoid neoplasms. *Leukemia*. 2022;36(7):1720-1748. DOI: [10.1038/s41375-022-01620-2](https://doi.org/10.1038/s41375-022-01620-2).

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