

In acute lymphoblastic leukemia (ALL), the malignant clone arises from hematopoietic progenitors in the bone marrow or lymphatic system resulting in an increase of immature nonfunctioning leukemic cells. Infiltration of bone marrow leads to anemia, granulocytopenia, and thrombocytopenia with the clinical manifestations of fatigue, weakness, infection, and hemorrhage. These symptoms are more often the reason a patient first seeks medical advice rather than consequences of tumor bulk, such as lymph node enlargement, hepatosplenomegaly caused by leukemic infiltration, or symptoms of the central nervous system (meningeosis leukemica).

■ INCIDENCE AND AGE

ALL is the most frequent neoplastic disease in children with an early peak at the age of 3–4 years. The incidence in adults ranges from 0.7 to 1.8/100 000 per year, being somewhat higher in adolescents and young adults (AYAs), decreasing in adults, but increasing again in elderly people. Thus, Philadelphia chromosome–positive ALL (Ph+ ALL; *BCR/ABL* translocation) is observed in half of elderly B-lineage patients. The frequency of immunologic, cytogenetic, and genetic subtypes changes substantially with age.

■ ETIOLOGY

The etiology of acute leukemias is unknown. Internal and external factors influence the incidence of leukemia. Exposure to ionizing radiation or to chemicals, including prior chemotherapy, is associated with an increased risk of developing leukemia, more often observed in acute myeloid leukemia (AML). However, increasingly, secondary ALLs have been observed, particularly after cytostatic treatment with alkylating agents and topoisomerase inhibitors as treatment for