Precursor T lymphoblastic leukemia/lymphoma
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**Definition:** a neoplasm of lymphoblasts committed to the T-cell lineage.

- lymphoma: mass, without or minimal blood and BM involvement
- lymphoblastic leukemia: extensive BM and blood involvement (>25% BM cells)
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Epidemiology

-15% of childhood ALL
-25% of adult ALL
-80-95% of lymphoblastic lymphoma
-More in adolescents and males
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**Clinical features:**
- Leukemia: high WBC
- Lymphoma: large mediastinal mass (or other tissue mass), rapid growth, pleural fluid involvement
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Sites of involvement:
- Leukemia: blood and BM, all cases
- Lymphoma: mediastinal mass: 50%; Others: LN, skin, liver, spleen, Waldeyer’s ring, CNS, gonads
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Morphology:
Similar to precursor B-ALL/LBL
High number of mitotic figures
A small number of LBL cases with eosinophilia, myeloid hyperplasia:
  some of them associated t(8;13)(p11.2;q11-22)
  some of them developed myeloid malignancy
Acute Lymphoblastic Leukemia (L1)
Acute Lymphoblastic Leukemia
Acute Lymphoblastic Leukemia
Acute Lymphoblastic Leukemia

Bone Marrow

Bone marrow aspirate smear

Bone marrow biopsy
Acute Lymphoblastic Leukemia (L2)
Lymphoblastic Lymphoma

Mediastinal mass: Lymphoblastic lymphoma

Peripheral blood: Acute lymphoblastic leukemia
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Cytochemistry:
Acid phosphatase
TdT
PAS: nuclear
Acid phosphatase
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**PAS Stain**
Nuclear is partially encircled by a rim of PAS reactivity.
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**Immunophenotype:**
- TdT: +
- cCD3, the only lineage specific marker
- CD4,8: double – or +
- Variable surface: CD1a,2,3,5,7,10,79a,13,33,117 (rare)
- TCR: may have rearrangement, not lineage specific
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Genetics:

TCR loci (1/3 of T-ALL):
- 14q11.2 (alpha, delta)
- 7q35 (beta)
- 7p(14-15) (gamma)

Genes:
- MYC (8q24.1)
- TAL (1p32)
- RBTN1 (LMO1) (11p15)
- RBTN2 (LMO2) (11p13)
- HOX11 (10q24)
- LCK (1p34.3-35)
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**Differential diagnosis:**
- B-ALL and AML(M0) by immunophenotyping, not morphology
- Hematogones (normal B precursors) mimic blasts morphologically
  TdT, CD34, CD10, pan B markers maturing, no marker aberrance or clonality
  (neuroblastoma, post-chemo, iron deficiency, ITP)
- Burkitt
- Blastoid variant of mantle cell lymphoma
Hematogones
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Prognosis: survival comparable to B-ALL with current treatment