12.1: Introduction to Leukemias

An image from a peripheral blood smear demonstrating blasts with a loose, immature chromatin pattern, a high nuclear-cytoplasmic ratio, and basophilic cytoplasm seen in an Acute Leukemia. 50x oil immersion. From MLS Collection, University of Alberta, https://doi.org/10.7939/R3TB0Z99Q

An image from a bone marrow smear demonstrating an abundance of blasts and a reduction of normal hematopoietic cells seen in an Acute Leukemia. 50x oil immersion. From MLS Collection, University of Alberta, https://doi.org/10.7939/R3Z31P43G

**Leukemia**: Describes tumors that originate from the bone marrow.¹

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**Lymphoma**: Describes tumors that originate from the lymphatic tissues.¹
The causes of acute leukemia are vast. There are a number of factors that can lead to the development of leukemia, such as: genetic mutations, environmental factors (e.g. exposure to drugs, chemicals, radiation), inherited syndromes (e.g. Down syndrome, fanconi anemia), viral infections (e.g. HIV), immunologic dysfunction (e.g. immunosuppressants), or idiopathic factors.¹

There are different classification systems that exist to categorize acute and chronic leukemias. Two examples are the French-American-British (FAB) system and the World Health Organization (WHO) system.¹-⁴

**Note:** Please be aware that these schemes are updated periodically and the sources used in this ebook may not reflect the most current classification systems used.

Leukemias are described as being “acute” or “chronic” and specified as to which cell lineage and maturation stage is affected.⁵

**Table 1. Comparison of Acute and Chronic Leukemias.**⁵,⁶

<table>
<thead>
<tr>
<th>Acute</th>
<th>Chronic</th>
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<tbody>
<tr>
<td>All ages affected</td>
<td>Mainly adults affected</td>
</tr>
<tr>
<td>Rapid onset</td>
<td>Insidious onset</td>
</tr>
<tr>
<td>Involve immature cells</td>
<td>Involve mature cells</td>
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<tr>
<td>≥20%* blasts in PBS or BM</td>
<td>≤20% blasts in PBS or BM</td>
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</table>

*WHO Classification Criteria

**References:**


