Case 1
Normal Peripheral Blood Smear
Normal Bone Marrow
Case 1
Summarize findings on a normal peripheral blood smear (high power)

Case 1
Summarize how a bone marrow biopsy is performed

Bone Marrow Aspiration and Biopsy

Case 1
Briefly describe the following:
- Bone marrow core biopsy
- Bone marrow aspirate smear
- Bone marrow clot section
Case 1
Normal bone marrow biopsy (low power)
Summarize the findings and identify labels (3)

Case 1
Normal bone marrow biopsy (high power)
Summarize the findings and identify labels (3)

Case 1
Normal Bone Marrow Biopsy
Approximately how old is the patient?

A
B
Case 1
Normal bone marrow aspirate smear (high power)
Identify granulocyte precursors, erythroid precursors and megakaryocytes

Case 2
Normal Lymphoid Organs

Case 2
Reactive Lymph Node (Low Power)
Describe histologic findings including structures labeled with A, circle
Case 2

Name the structures highlighted by the asterix. What is "A"?

Case 2

What types of cells compose the structure highlighted by the asterix?

Case 2

What size are normal lymph nodes?

Are peripheral lymph nodes palpable in normal healthy individuals?
Case 2

What is the organ (low power)?

Describe the findings. Identify what A, B and C represent.

Case 2

What is the usual size and weight of the organ depicted in the last 2 histologic images?

Is it normally palpable on physical exam?
Case 3

History

A 60 year-old man presents with mild fatigue. Further questioning reveals a vague feeling of abdominal “fullness” and more bruising of his skin. Physical examination is remarkable for splenomegaly to the level of the umbilicus.

Case 3 - CBC

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>WBC</td>
<td>75.1x10^3/μL</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>8.5g/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>25.5%</td>
</tr>
<tr>
<td>Platelets</td>
<td>56,000/μL</td>
</tr>
<tr>
<td>MCV</td>
<td>88.4 femtoliters (fL)</td>
</tr>
<tr>
<td>RDW</td>
<td>16.1</td>
</tr>
</tbody>
</table>

The hematology analyzer has flagged the specimen for possible immature WBC forms.

Case 3 – Peripheral Blood Smear – low power. Is this blood smear normal or abnormal?
Case 3 – Peripheral Blood Smear
Describe the number and morphology of the WBCs, RBCs, and platelets. Does it correlate with the CBC?

Case 3 – Peripheral Smear. What cell line comprises the immature cells?

Case 3 - Bone Marrow Biopsy is done. Summarize the low power findings
Case 3 - Bone Marrow Karyotype

Case 3

What is your diagnosis?

Case 3

How do the history and physical examination findings relate to the diagnosis and to the CBC results?
Case 3

The image is from a patient with the same disease who underwent autopsy examination. Describe the findings.

Case 3

What is the clinical significance of the identified findings on the karyotype?

Case 3

Define “leukemoid reaction”. What distinguishes leukemoid reaction from our patient’s diagnosis?
Case 4 - History

A 45 year-old man presents for evaluation of an enlarged non-tender cervical lymph node. The node has shown progressive enlargement over the past 4 months. The patient denies other symptoms such as fevers, night sweats, weight loss or fatigue.

Case 4

Develop a differential diagnosis (using broad categories) for cervical lymphadenopathy
An excisional biopsy of an enlarged lymph node is performed.

Comment on the size of the lymph node. Describe the gross findings.

Case 4 – Describe the histologic findings on low power. Compare to a reactive lymph node.
Case 4 – Describe the histologic findings. What is the asterix indicating?

Case 4 - Describe the high power findings.

Case 4

What is your diagnosis?

What are other common histologic subtypes of this disease?

What does the term “B Symptoms” refer to?
Case 5 - History

A 3-year-old boy has had a 5-day history of upper respiratory tract infection symptoms. His parents are concerned because he has grown progressively listless. Physical examination reveals a pale child with normal vital signs. He has scattered petechiae on his chest and extremities.

Laboratory data:
- WBC: 65,110/μL
- Hemoglobin: 6.4 g/dL
- Platelet count: 30,000/μL

Case 5 - Peripheral Blood Smear

Describe the cells.

[hints – describe the N/C ratio, describe the cytoplasm (do you see granules?), describe the nuclear chromatin (does it look “clumpy” or “fine”), can you identify any nucleoli?]

Further diagnostic work-up is performed.
- The bone marrow is hypercellular and packed with the same cells as seen on the peripheral smear.
- The abnormal cells on the peripheral smear and in the bone marrow are
  - TdT positive
  - CD 19 positive
Case 5

What is your diagnosis?

Correlate the pathologic findings with the clinical and CBC findings.

Case 5

Be prepared to summarize features of this case with that of case 6 (see last slide)

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Case 6 - History

A 68 year-old man is seen by his primary care physician for a physical examination. Overall, he feels well. His wife is concerned about the "lumps" on his neck. Physical examination is remarkable for non-tender cervical, axillary and inguinal lymphadenopathy. The spleen is not enlarged.
Case 6
Patient has marked bilateral lymphadenopathy

Case 6

Case 6
CBC

- WBC: 39.6 x 10^3/μL
- Hemoglobin: 10.5 g/dL
- Hematocrit: 30.2%
- MCV: 86.0 fl
- RDW: 16.2
- Platelets: 149,000/μL
Case 6 – Peripheral Blood Smear – low power. Normal or abnormal? Describe the findings

Case 6 – Peripheral Blood smear-high power. Describe the findings

Case 6 – What does the cell with arrow signify?
Case 6

What is your diagnosis? If a bone marrow biopsy were done, what would it show?

Are the findings on the CBC and peripheral blood smear related to the patient’s lymphadenopathy?

Case 6

If a lymph node biopsy were to be done on this patient, it would show the following features:

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Case 6 – Describe the low power findings. Normal or abnormal?

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Reactive LN
Case 6
Describe the high power findings

Case 6
What lymphoma have you diagnosed?

Comparison Cases 5 and 6
What is the cell of origin?
What is the stage of differentiation?
Which is more common in children? in adults?
Which has a more “indolent” course?