Lymphoma

Overview

- Concepts, classification, biology
- Epidemiology
- Clinical presentation
- Diagnosis
- Staging
- Three important types of lymphoma

How Cancer Develops

- Normal cells are programmed to multiply, d
  when they're old
- Signals to multiply and die are controlled b
  specific genes
- Mutations can occur in these genes
- If enough mutations occur in genes
  controlling growth or cell death a cell begir
  to **multiply uncontrollably**
- The cell has then become cancerous or
  "malignant"

Features common to cancer ce

- Growth in the absence of “go” signals
- Growth despite “stop” signals
- Locally invasive growth and metastas
  to distant sites

Bone Marrow

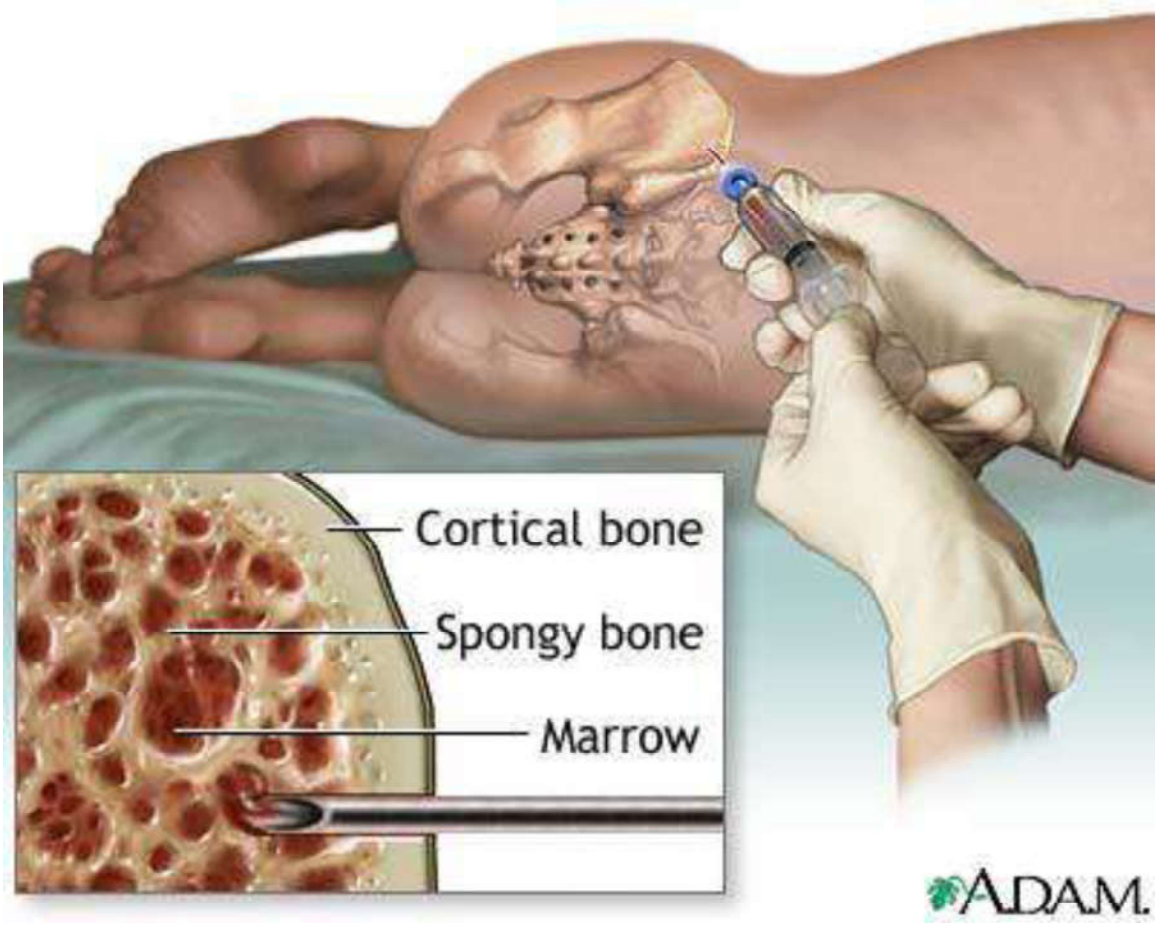
- Present in the soft inner part of some bone such as the skull, shoulder, blade, ribs, pel and backbones. (Occupies central cavity o bone)

- The bone marrow is made up of blood-forr stem cells, lymphoid tissue, fat cells, and supporting tissues that aid the growth of bl forming cells.

Bone Marrow

- Spongy tissue where development of a types of blood cells takes place
- All bones have active marrow at birth
- Adulthood - vertebrae, hip, shoulders, ribs, and skull contain marrow

Bone Marrow Aspiration/Biop



Hematopoietic Malignancie

- **Lymphoma is a general term for hematopoietic solid malignancies of the *lymphoid* series.**

- **Leukemia is a general term for liquid malignancies of either the *lymphoid* or the *myeloid* series.**

Conceptualizing lymphoma

- neoplasms of lymphoid origin, typical causing lymphadenopathy
- leukemia vs lymphoma
- lymphomas as clonal expansions of cells at certain developmental stages

What is Lymphoma

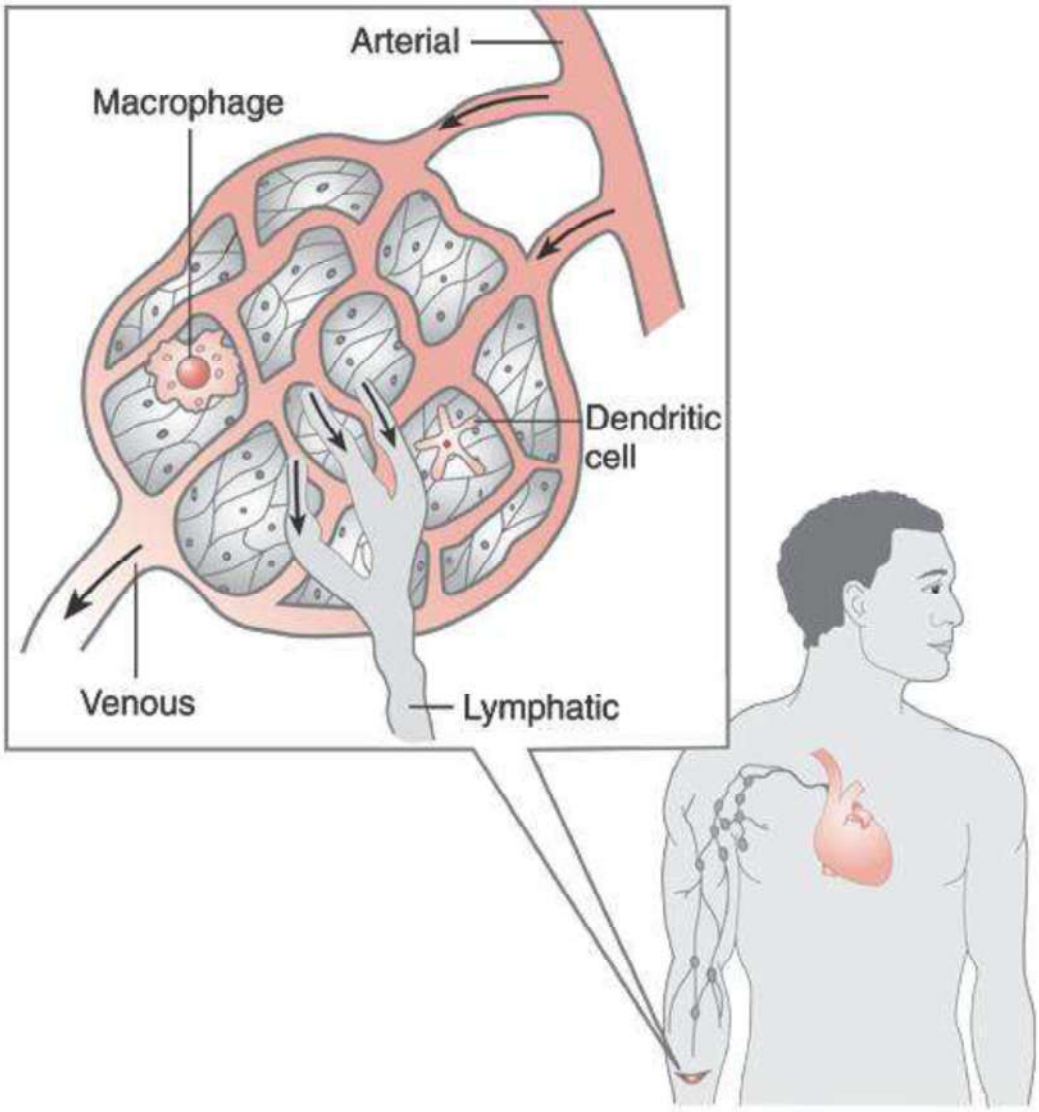
- Lymphomas are cancers that begin b
  the “malignant transformation” of a
  lymphocyte in the lymphatic system
- Many lymphomas are known to be du
  to specific genetic mutations
- Follicular lymphoma due to
  overexpression of BCL-2 (gene that
  blocks programmed cell death)

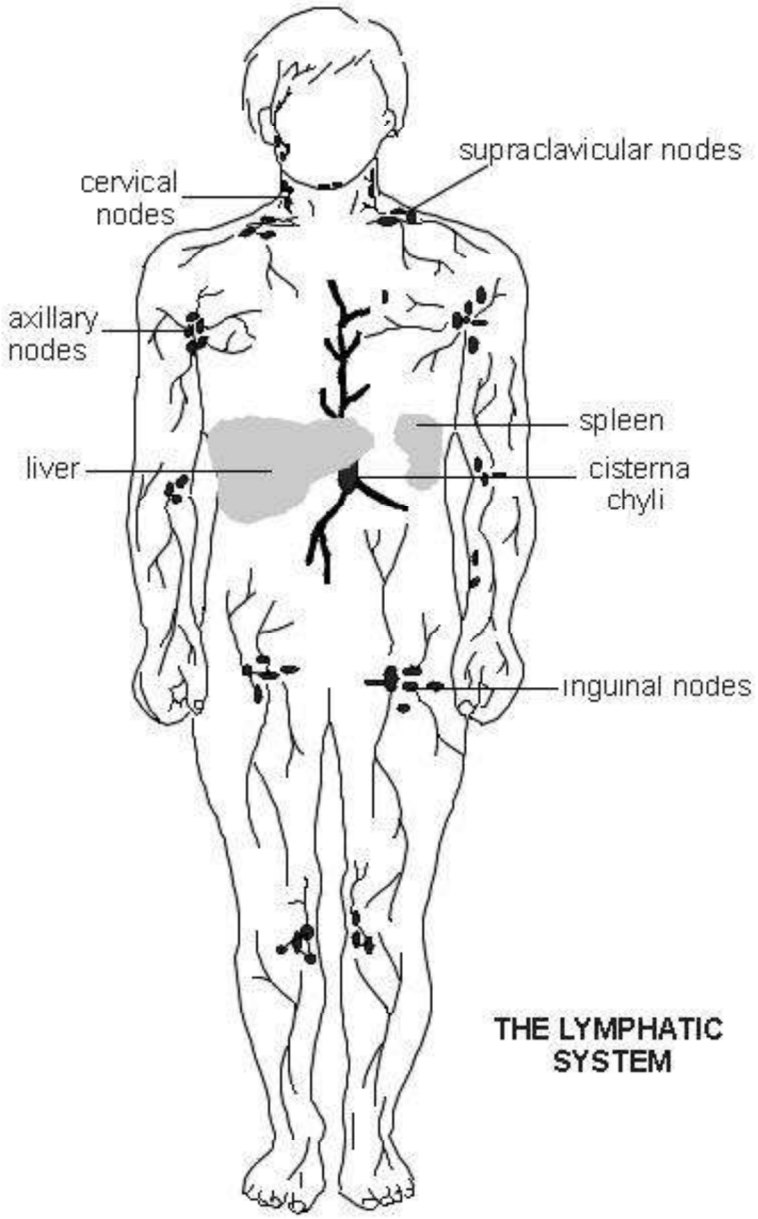
What is the Lymphatic System

- Made up of organs, such as the tonsils, spleen, liver, bone marrow and a network o lymphatic vessels that connect glands, call lymph nodes
- Lymph nodes located throughout the body
- Lymph nodes filter foreign particles out of t lymphatic fluid
- Contain B and T lymphocytes

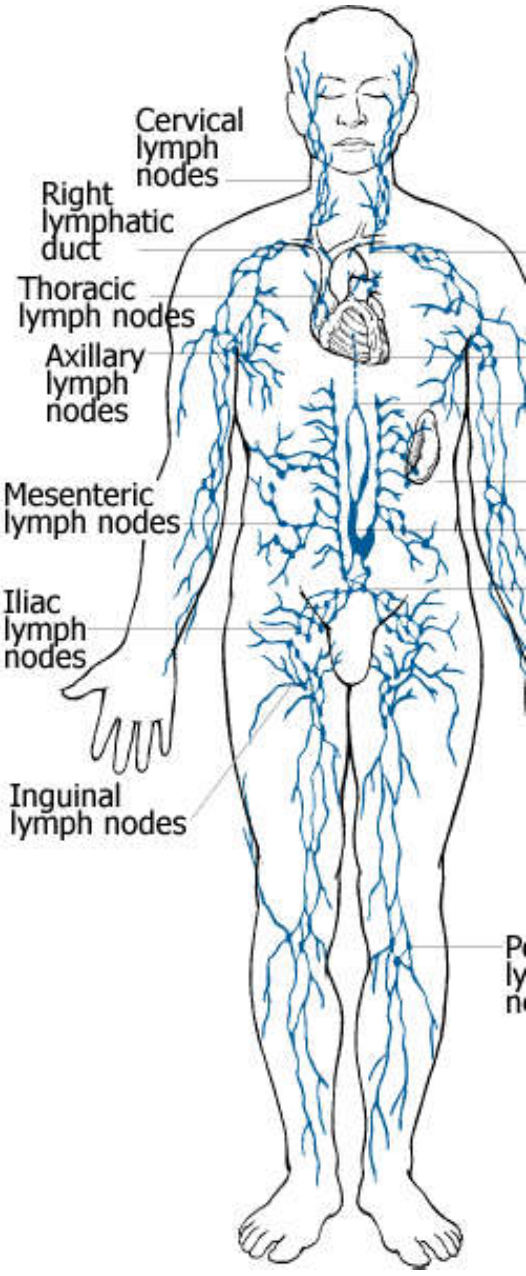
Lymphatic System

- Lymph nodes act as a filter to remove bacteria, viruses, and foreign particles
- Most people will have had “swolle glands” at some time as a respor to infection

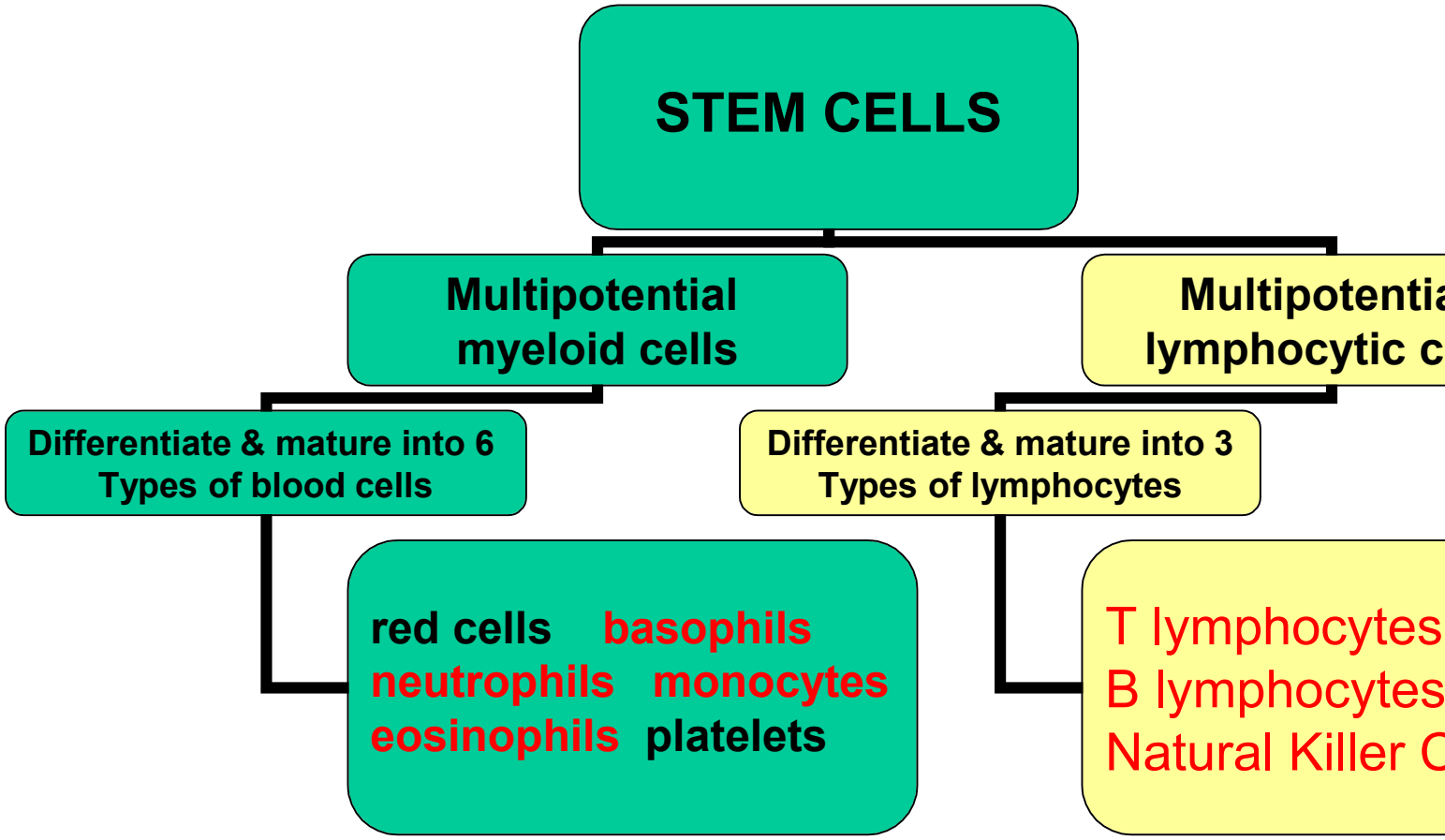




THE LYMPHATIC SYSTEM



Blood Cell and Lymphocyte Development

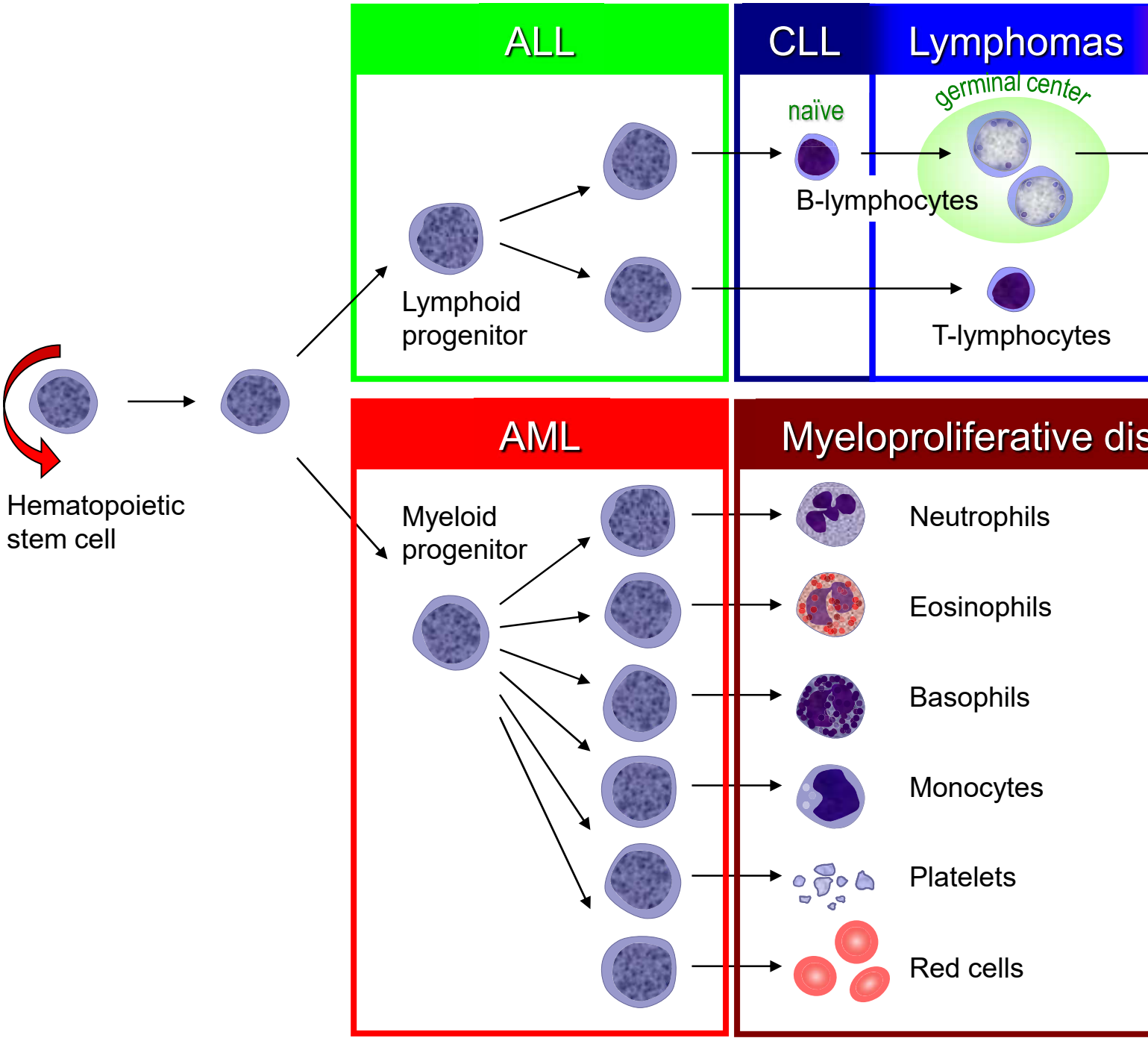


Lymphocytes

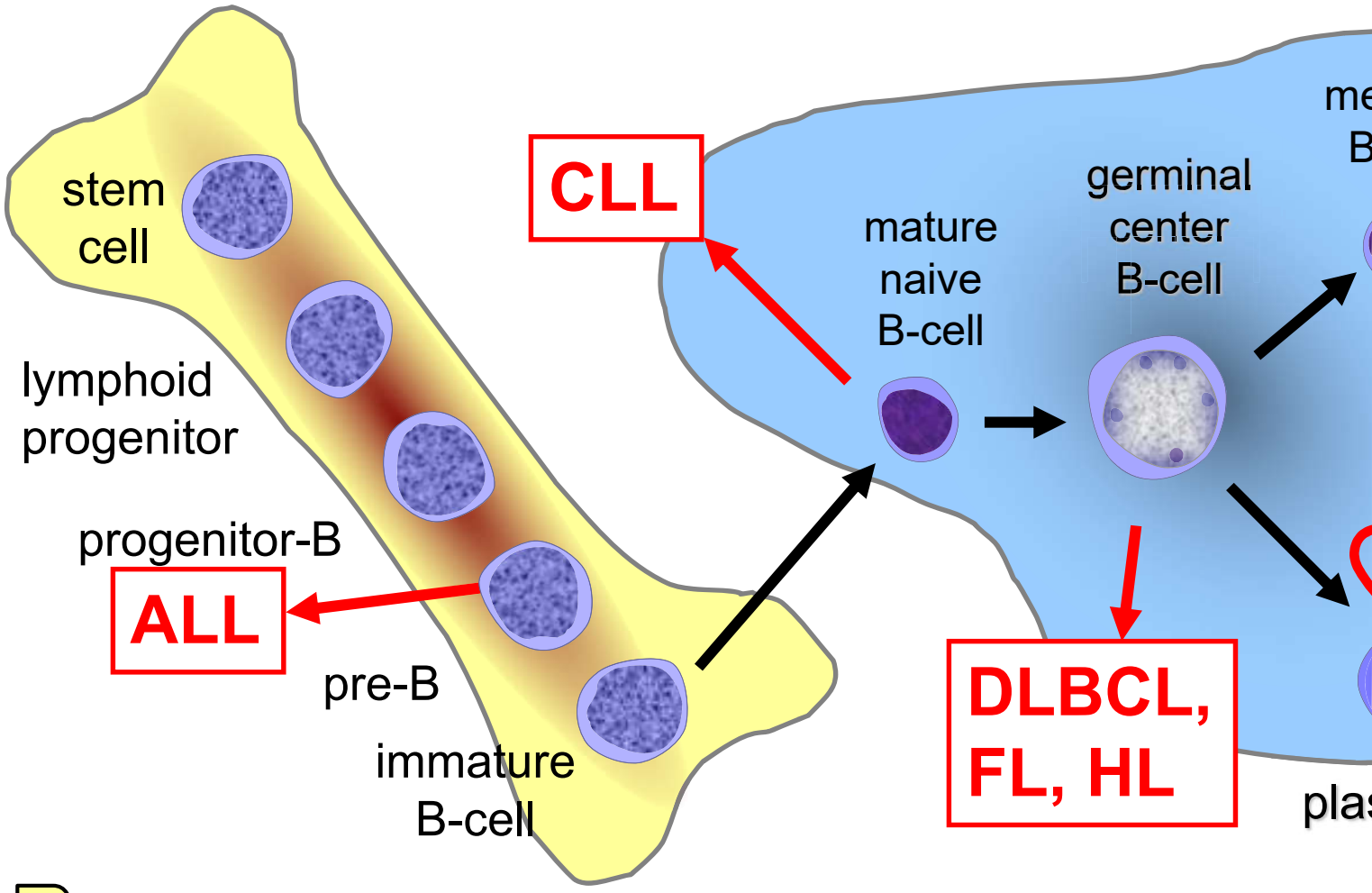
- Most lymphocytes are in lymph nodes, spleen, bone marrow and lymphatic vesse
- 20% of white blood cells in blood are lymphocytes
- T cells, B cells, natural killer cells
- B cells produce antibodies that help fight infectious agents
- T cells help B cells produce antibodies and they fight viruses

T-Cells and B-Cells

- Immature lymphocytes that travel to t
thymus differentiate into T-Cells
  - “T” is for thymus
- Immature lymphocytes that travel to t
spleen or lymph nodes differentiate into B
cells
  - "B" stands for the bursa of Fabricius, which
an organ unique to birds, where B cells
mature.


ALL
CLL
Lymphomas
naïve
germinal center
B-lymphocytes
Lymphoid
progenitor
T-lymphocytes
Hematopoietic
stem cell
AML
Myeloproliferative dis
Myeloid
progenitor
Neutrophils
Eosinophils
Basophils
Monocytes
Platelets
Red cells

B-cell development



Classification

Biologically rational classification	Clinically usef classificatio
Diseases that have distinct • morphology • immunophenotype • genetic features • clinical features	Diseases that have di • clinical features • natural history • prognosis • treatment

Classification

- Usually classified by how the cells loo under a microscope and how quickly they grow and spread
  - Aggressive lymphomas (high-grade lymphomas)
  - Indolent Lymphomas (low-grade lymphomas)

Lymphoma classificatio
(2001 WHO)

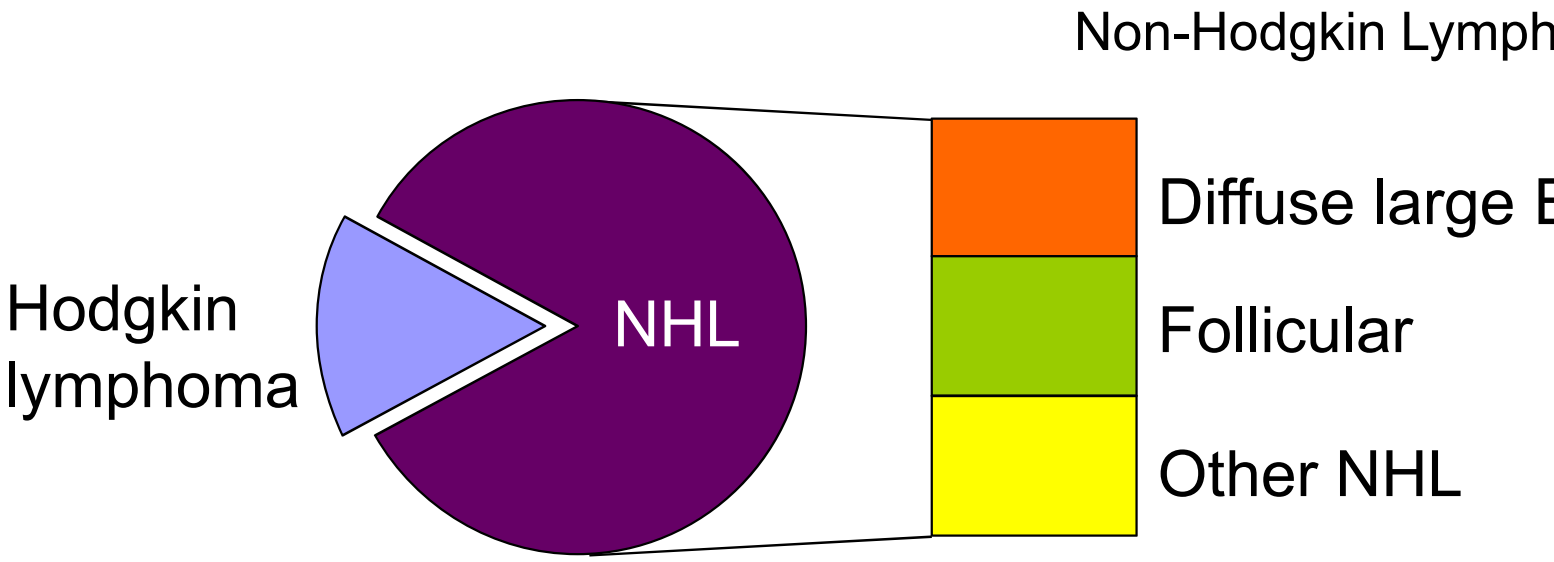
- B-cell neoplasms
  - precursor
  - mature
- T-cell & NK-cell neoplasms
  - precursor
  - mature
- Hodgkin lymphoma

Non-
Hodgk
Lymph

Three common lymphom

- Follicular lymphoma
- Diffuse large B-cell lymphoma
- Hodgkin lymphoma

Relative frequencies of different lymphomas



Follicular lymphoma

- most common type of “indolent” lymphoma
- usually widespread at presentation
- often asymptomatic
- not curable (some exceptions)
- associated with BCL-2 gene rearrangement [t(14;18)]
- cell of origin: germinal center B-cell

- defer treatment if asymptomatic ("watch-and-wait")
- several chemotherapy options if symptomatic
- median survival: years
- despite "indolent" label, morbidity and mortality can be considerable
- transformation to aggressive lymphoma can occur

Diffuse large B-cell lympho

- most common type of “aggressive” lymphoma
- usually symptomatic
- extranodal involvement is common
- cell of origin: germinal center B-cell
- treatment should be offered
- curable in ~ 40%