

Lymphatic System

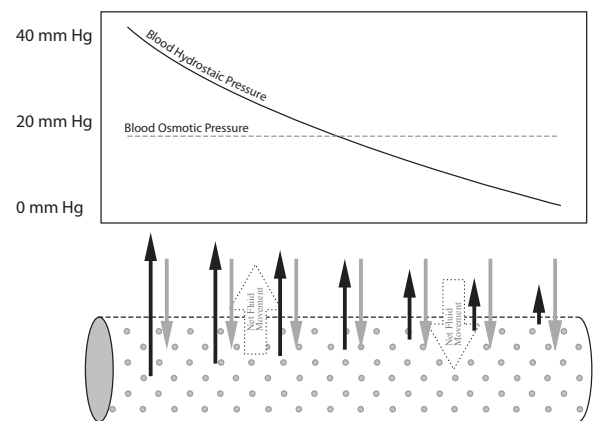
Please have the following handouts available.
They can be found in the blood lecture:

- *Iron Transport*
- *Heme Metabolism*

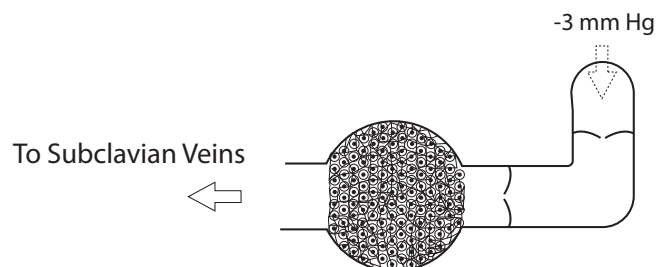
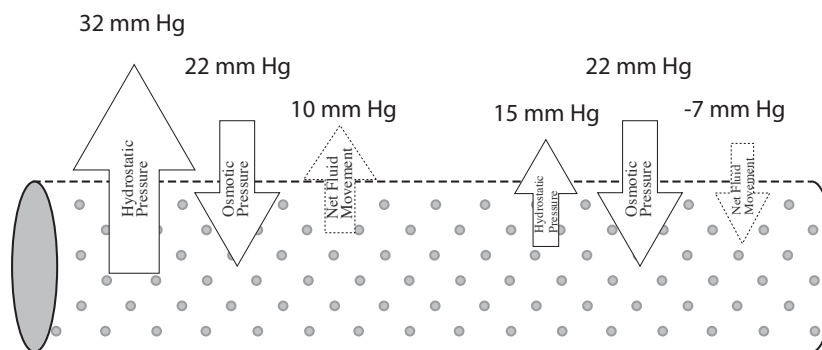
1. Lymphatic System Overview

A. Capillary Exchange Review

Fluid Movement at the Capillary



B. Pressure Issues



C. Lymphatic System and Fluid Drainage

i. Blockage and Edema

a. Examples

- Elephantiasis
- Lymph Node Removal

D. Infection, Inflammation, and the Lymphatic System

Interlude: A quick diversion to review and expand on Hematopoiesis, before going on with the lymphatic system (there is a reason for this, I promise!)

1. Hematopoiesis Overview and Review

**** Have this handout in hand →**

A. Stem Cells

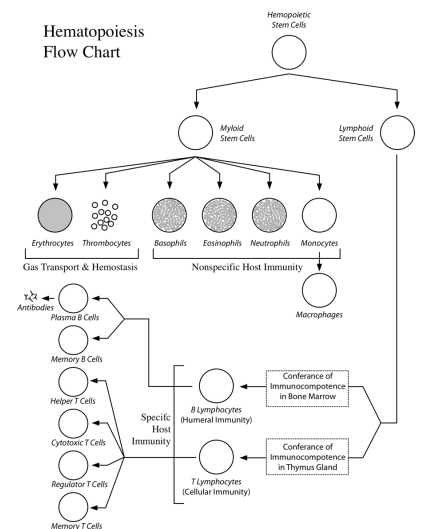
B. Nonspecific Host Immune Cells and Functions

i. Basophils

- Histamine
- Heprin

ii. Neutrophils

- Phagocytic
- Pyrogen



iii. Monocytes → Macrophages

- Phagocytosis

iv. Eosinophils

- Parasitic Infections
- Plasminogen

C. Specific Host Immune Cells and Functions

i. Humeral Immunity

- B Lymphocytes

ii. Cellular Immunity

- T Lymphocytes

3. Lymphatic System – General Overview of *Anatomical* Considerations

A. Lymph Capillaries

B. Lymphatics (or Lymphatic Vessels)

C. Histological Concerns

i. Endothelia

ii. Reticular Connective Tissue

- a. Reticulum “net”

iii. Irregular Dense Connective Tissue

- D. Major Lymphatic Organs
 - i. Lymph Nodes
 - ii. Spleen
 - iii. Thymus Gland
 - iv. Tonsils
4. Lymphatic System – General Overview of *Physiological* Considerations
 - A. Absorbs Interstitial Fluid with Small Proteins
 - Lymph
 - Note fluid Name Changes (plasma → interstitial fluid → lymph)
 - B. Absorb Lipids from Small Intestine
 - Chyle
 - C. Immunity
5. Flow of Lymph
 - A. Pressure & Valves
 - B. Skeletal Muscle Contraction
 - Milking
 - C. Breathing
 - Milking
6. Composition of Lymph

7. Functional Cells (*Pull out handout on Hematopoiesis*)

A. Monocytes

- Macrophage Cells

B. Lymphocyte (*Pull out handout on Introduction to Specific Host Immunity*)

i. B Cells

- B Cells → Plasma Cells → Antibodies

ii. T Cells

- T Cells → Killer T Cells

8. Lymphatic Capillaries and Ducts

A. Capillaries

i. Endothelial Tissue

ii. Absorption and Diapedesis

iii. Regulate Lymph Movement

- * Flap Valves

iv. Location: Innermost and Outermost Surfaces of the Body,

a. Skin

b. Respiratory

c. Digestive Systems ETC. ETC.

v. Lacteals

a. Chyle

B. Major Lymphatic Ducts

i. Right Lymphatic Duct

- Right Lymphatic Duct → Right Subclavian Vein

ii. Thoracic Duct.

- Thoracic Duct. → Left Subclavian Vein

9. Lymph Nodes

A. Location – “Portals of Entry”

i. General

a. Superficial

b. Deep

ii. Specific

a. Cervical

e. Inguinal

b. Axillary

f. Pulmonary

c. Mesenteric

g. Mammary

d. Iliac

h. Mediastinal

B. Anatomy

i. Capsule

ii. Trabeculae

- iii. Cortex
 - a. Lymph Nodules
 - b. Germinal Center
- iv. Medulla
- v. Hilus

10. Tonsils

- Efferent Vessels
- Portal of Entry
- A. Pharyngeal
- B. Palatine
- C. Lingual

11. Spleen

- A. Spleen Anatomy and Histology
 - i. Capsule
 - ii. Trabeculae
 - iii. Lobules
 - iv. Splenic Pulp
 - a. White Pulp
 - b. Red Pulp

- Venous Sinusoids

B. General Functions

i. Filter Blood

a. Iron (*Pull out handout on Iron Transport*)

- Ferritin
- Transferrin

b. Heme → Bile (*Pull out handout on Heme metabolism*)

ii. Lymphocytes and Monocyte Production

iii. Antibody Production

iv. Fetal Blood Production

v. Blood Reservoir

12. Thymus Gland

A. Location and Anatomy

B. Function

i. Development of Immunocompetence

ii. Fetal Thymus Gland

13. Aggregated Lymph Nodules (Peyer's Patches)

- Gut-Associated Lymphoid Tissue (GALT)