Objectives

- Overview of the vessels.
- Define the different type of blood vessels.
  - Arteries
  - Veins
  - Capillaries
- Identify the tissue layers of blood vessels.
- Distinguish the different forms of arteries, veins and capillaries.

Function of the Blood Vessels

Transport blood to and from the heart.

I. **Arteries** deliver oxygenated blood to tissues.
II. **Veins** carry deoxygenated blood to the heart.
III. **Capillaries** are the site of gas exchange for internal respiration.
Tissue Layers of Vessels

**Tunica interna**
- Inner most layer (lining of lumen)
- Endothelium
- Simple squamous cells
- Selectively permeable
- Found in ALL vessel types

**Tunica media**
- Middle layer of blood vessels
- Consists of smooth muscle
- Sheets of elastin (protein layer) for variable constriction.
- Contain collagen – gives strength
- Thickest in muscular arteries.

**Tunica externa**
- Outermost layer
- Composed of loose connective tissue
- Collagen reinforced
- Protection of vessel
- In large vessels contains tiny blood vessels – vas vasorum

Aka Tunica adventitia

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**Different forms of Arteries**

I. **Elastic Arteries**
   - Nearest heart

II. **Muscular Arteries**
   - Deliver blood to specific organs

III. **Resistance arteries**
   - aka Arterioles (small)
   - Regulate blood flow to capillaries.

*Metarteriole* – vessel running though capillary bed.
- Main pathway for blood.

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**Capillaries**

- Site of material exchange with the interstitial fluids.
  - Blood gasses
  - Nutrients

Associated terminology
- **Capillary bed** – tortuous pathway.
- **Precapillary sphincter** – circular muscle that controls flow through bed.
Different forms of Capillaries

I. Continuous
   Abundant in skin & muscles

II. Fenestrated
   Predominant in kidney & small intestine, very permeable.

III. Sinusoidal
   Common in liver, bone marrow, lymphoid issue.

Veins & Venules
- Carry deoxygenated blood back to the heart.
- Said to join, merge & converge.
- 65% of the body's blood supply in venous system.
- Contain valves to prevent backflow.

Post capillary venules:
   Porous
   White blood cells & fluids easily move out

Vascular Anastomoses
A network of blood vessels that supply a region of the body.
Occurs in & around:
   - Joints
   - Abdominal organs
   - Brain
   - Heart
Importance: Alternate pathways if traffic gets jammed or blocked.

Preparation for next class
Read Sections on Blood Vessels
Preview
   Part II – through Hypertension pg 706 - 712
Recommended
   Answer 63-70 in handouts on pg 1 & 2 CP.

Preparation for Lab
Prelab – Look over conditions on page 741.
On lab day bring:
   Textbook
   Lab Book
   Study Guide notes BI233 (cardiovascular section)
   Blood Pressure Cuff (if you have your own)