
Two classes of blood vessels based on location
1. Pulmonary vessels – transport blood to and from the lungs
2. Systemic vessels – transport blood to and from the body

Five functions of the circulatory system
1. Carries blood
2. Exchanges nutrients, waste products, and gases with tissues
3. Transports substances
4. Helps regulate blood pressure
5. Directs blood flow to the tissues

Three main types of blood vessels based on structure: arteries, veins, capillaries

1. Arteries – take blood AWAY from the heart
   Oxygen rich in systemic circulation, oxygen poor in pulmonary circulation
   Elastic – largest arteries, have more elastic tissue than smooth muscle
   Thickest walls, more elastic tissue than other types of arteries
   Aorta and Pulmonary Trunk
   Designed to withstand high pressure and provide elastic recoil
   Muscular – medium arteries, have more smooth muscle than elastic tissue
   Medium and small arteries
   Most of walls thickness is due to smooth muscle
   Important for controlling blood flow to different body regions
   Arterioles – smallest arteries, empty into capillaries
   Connect small arteries to capillaries
   Tunica media consists of only one or two layers of smooth muscle
   Important for controlling blood flow into capillaries

2. Veins – take blood TOWARDS the heart
   Oxygen poor in systemic circulation, oxygen rich in pulmonary circulation
   Venules – smallest veins, receive blood from the capillaries
   Endothelium and connective tissue only
   Only have tunica adventitia and tunica intima
   Small veins – slightly larger than venules, have all three layers
   If diameter greater than 2 mm have valves
   Medium veins
   Large veins
3. Capillaries – Connects arteries to veins, thinnest walls
   Only vessel in which exchange occurs between the blood and tissue fluid.
   Simple squamous epithelium with a thin layer of connective tissue
   Blood flows slowest through them
   Most numerous
   Precapillary sphincters – smooth muscle cells located at the beginning of
   the capillary branch, controls blood flow to that capillary branch

Blood Vessel Structure
   All vessels except capillaries and venules have three tunics (layers)
   1. Tunica intima – innermost
      Squamous endothelium
      A small amount of connective tissue
   2. Tunica media – middle
      Smooth muscle arranged in a circle
      Small amount of elastic tissue around the outside
   3. Tunica Adventitia (Tunica externa) – outermost
      Connective tissue

Lumen – space in the center of the blood vessel through which blood moves

Vasoconstriction – contraction of smooth muscle in blood vessels, resulting in decreasing the
diameter of the lumen and decreasing the blood flow.

Vasodilation - relaxation of smooth muscle in blood vessels, resulting in increasing the
Diameter of the lumen and increasing blood flow

Areas of circulation
   Pulmonary – lung
   Enteric – digestive tract
   Liver
   Renal – kidney
   Cerebral – brain
   Systemic Tissues – everything else

Blood vessels to know
   1. Carotid arteries and jugular veins
   2. Brachiocephalic arteries/veins
   3. Subclavian arteries/veins
   4. Aortic arch
   5. Thoracic aorta (descending)
   6. Pulmonary trunk
   7. Coronary arteries
   8. Iliac arteries
   9. Femoral artery
Brachiocephalic Veins & SVC

Right internal jugular
Right subclavian
Right brachiocephalic
Azygous

Left internal jugular
Left subclavian
Left brachiocephalic

SUBCLAVIAN
AXILLARY
BRACHIALS
CEPHALIC
BASILIC
INTEROSSEOUS
ULNAR
RADIAL
SVC
LEFT BRACHIOCEPHALIC

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