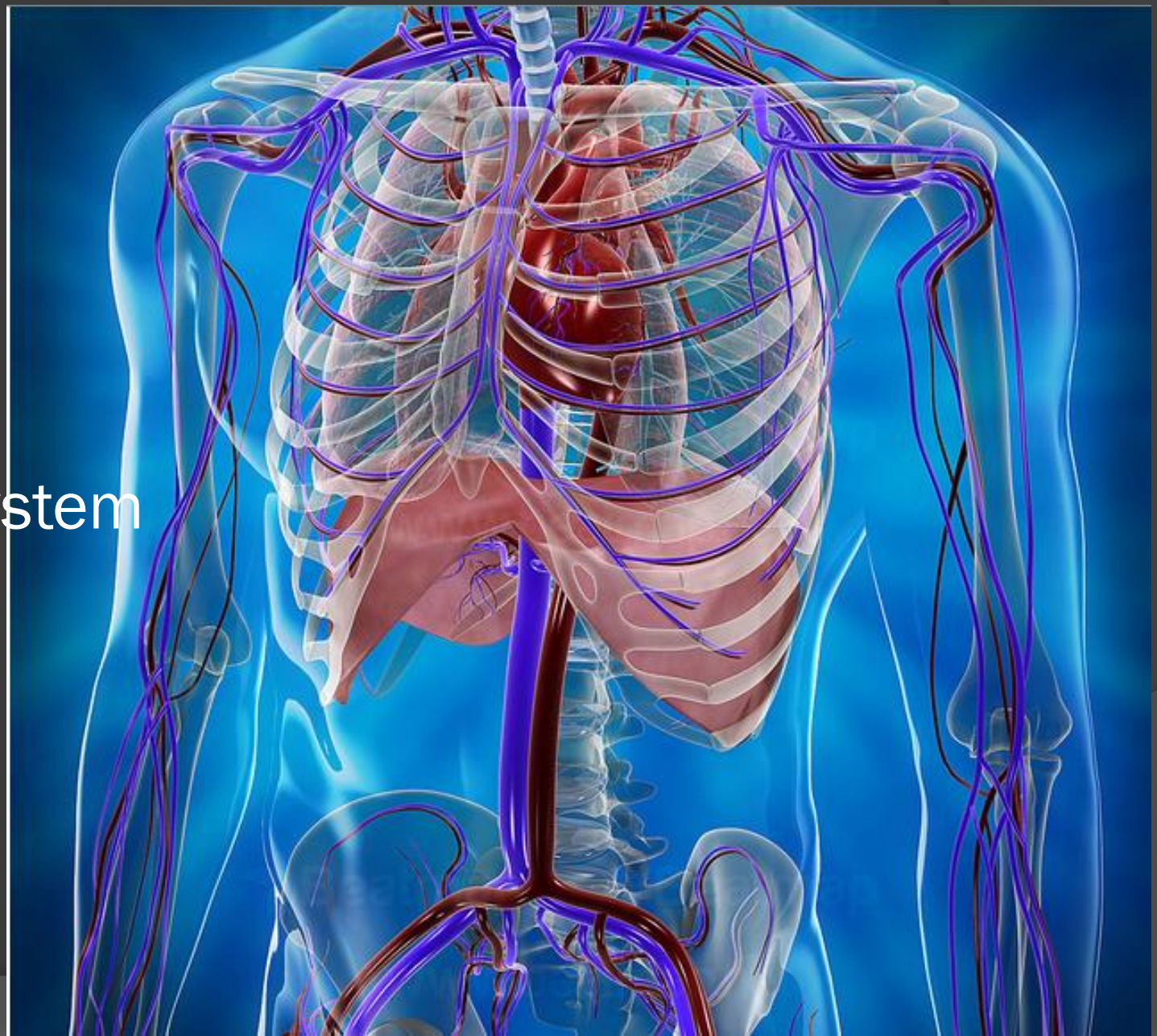
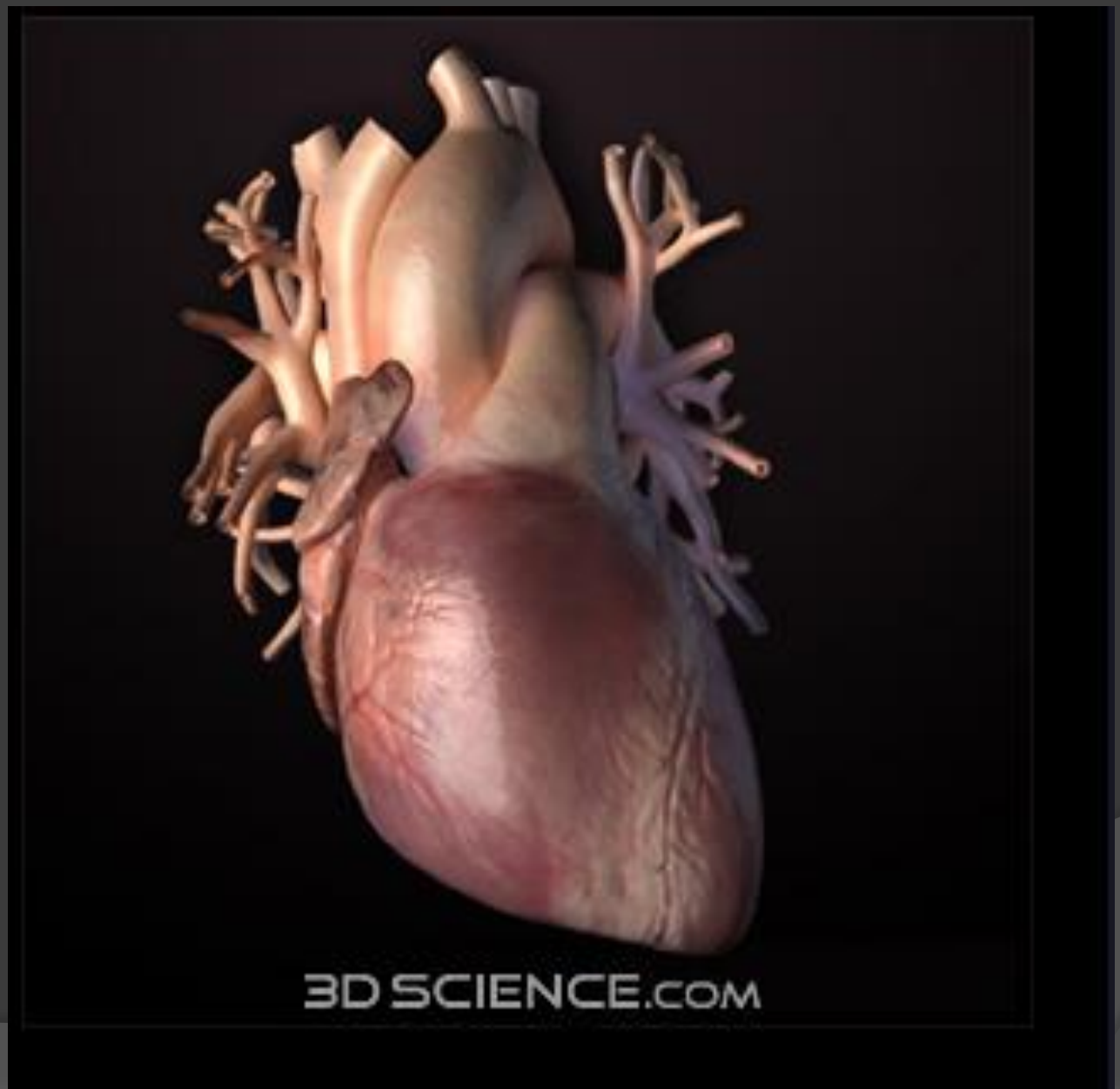
Chapter 15: Circulation

Section 1:

The Body's Transport System

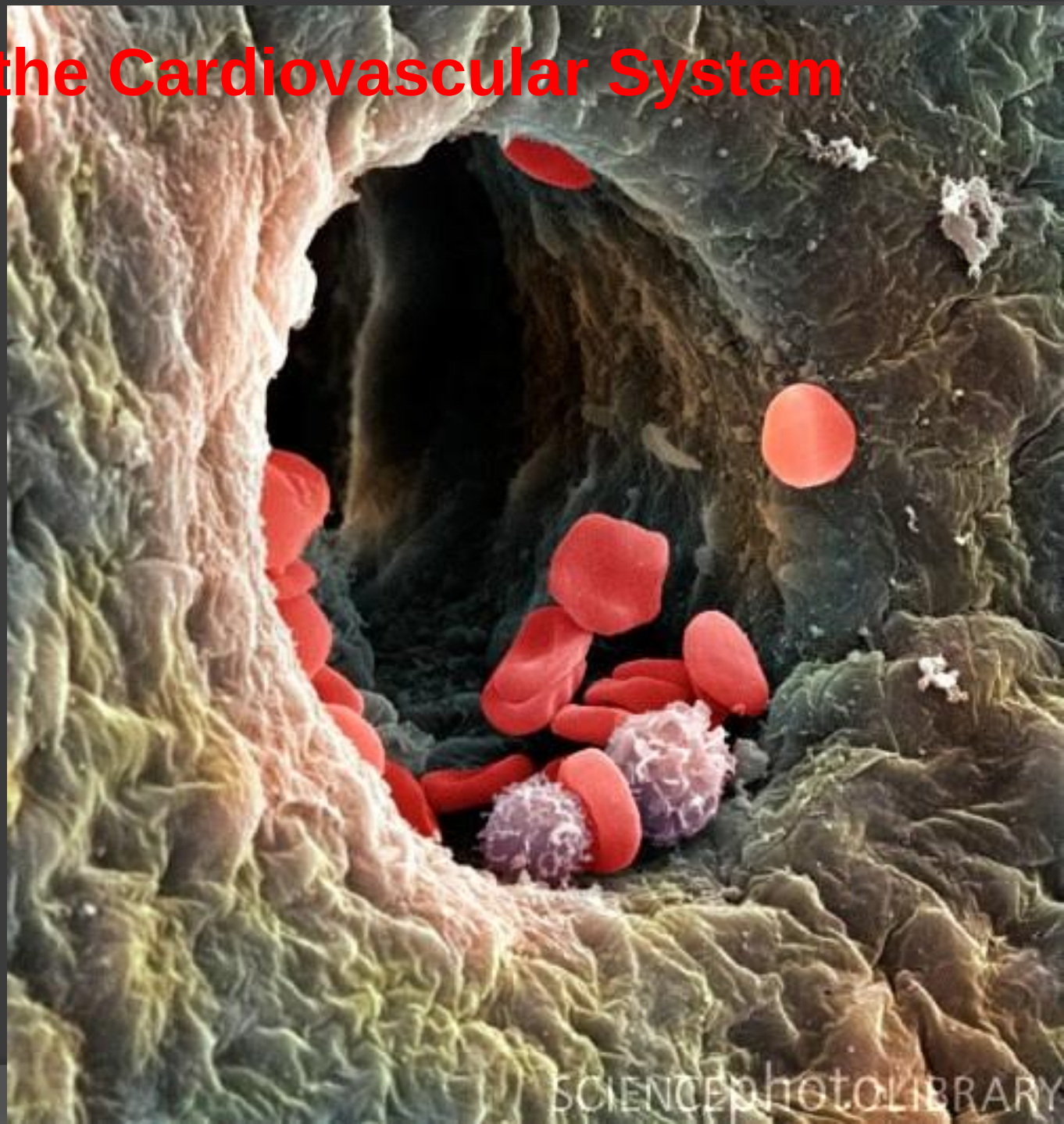


Beating Heart



Functions of the Cardiovascular System

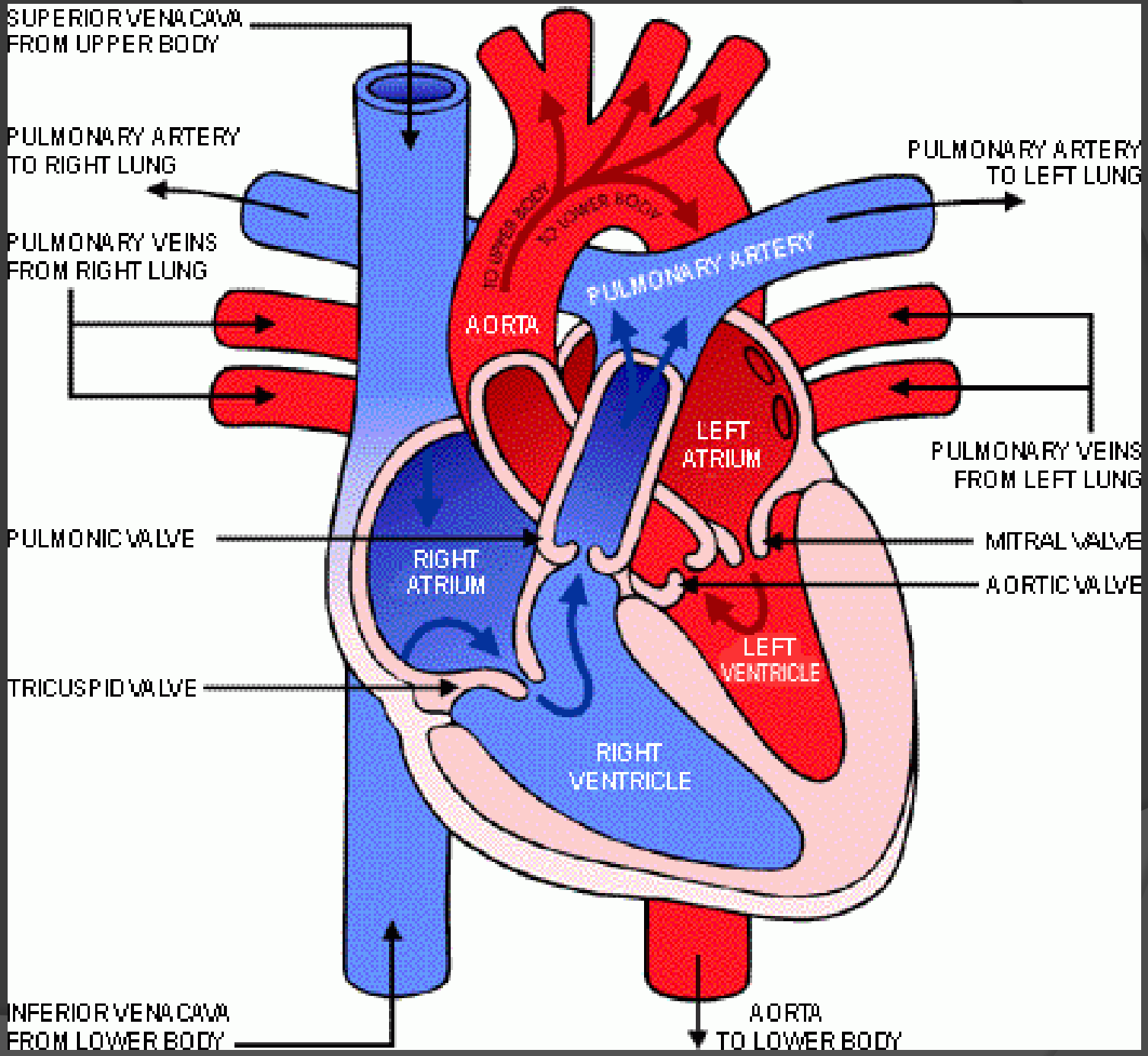
1. Carry _____to cells
2. Carry _____
3. Fight disease
4. _____ body temperature



Heart

Blood flow:

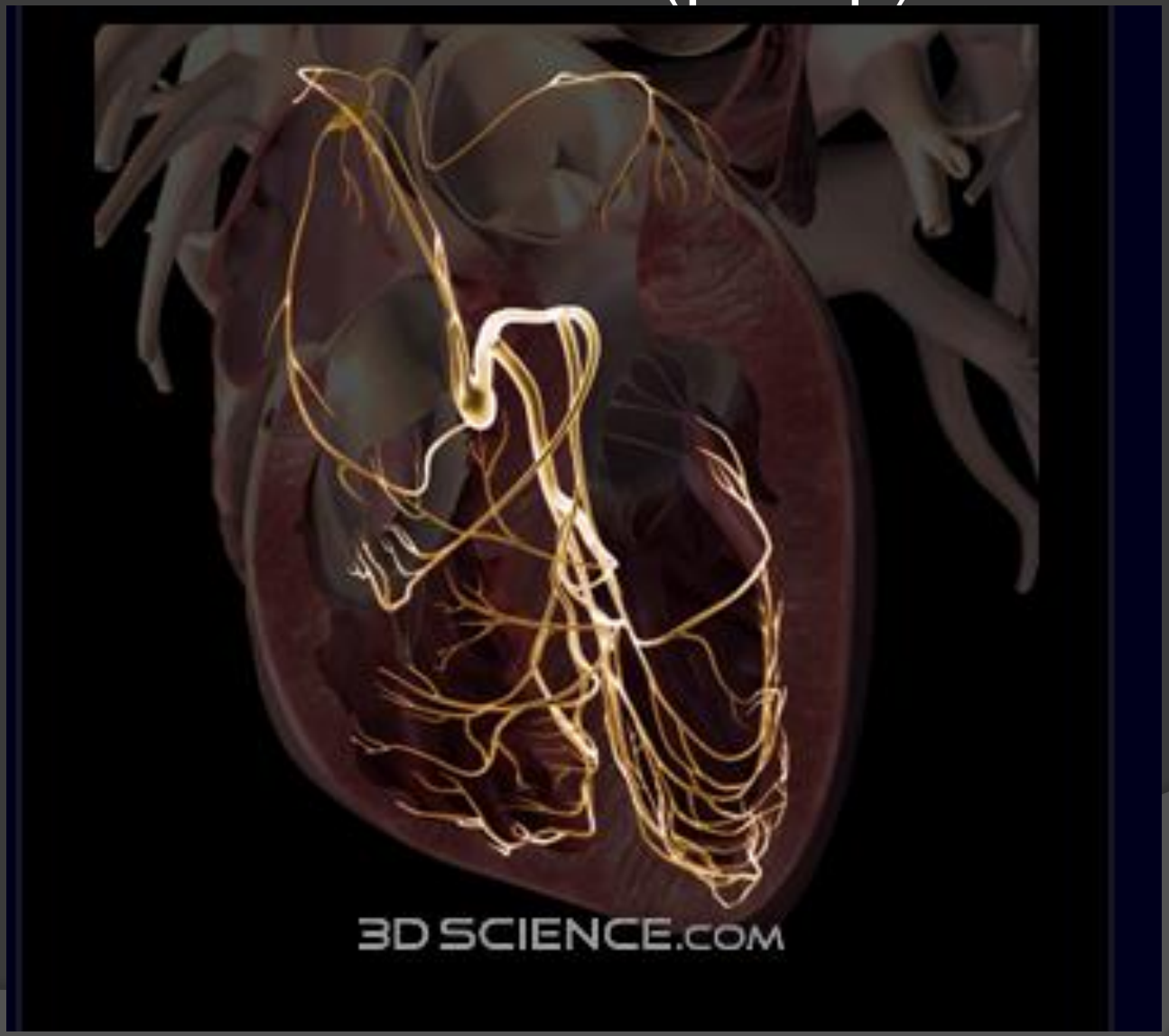
_____ blood from Body Cells → through _____ →
Right atrium → through _____ →
Right ventricle → Pulmonary Artery →
To Lungs → returns to heart by _____ →
Left Atrium → through _____ →
Left Ventricle → through _____ →
Aorta → back to body cells with _____ blood


SUPERIOR VENA CAVA
FROM UPPER BODY
PULMONARY ARTERY
TO RIGHT LUNG
PULMONARY VEINS
FROM RIGHT LUNG
PULMONARY ARTERY
TO LEFT LUNG
TO UPPER BODY
TO LOWER BODY
PULMONARY ARTERY
AORTA
LEFT
ATRIUM
PULMONARY VEINS
FROM LEFT LUNG
PULMONIC VALVE
MITRAL VALVE
RIGHT
ATRIUM
AORTIC VALVE
LEFT
VENTRICLE
TRICUSPID VALVE
RIGHT
VENTRICLE
INFERIOR VENA CAVA
FROM LOWER BODY
AORTA
TO LOWER BODY

Heart Valves-

- AV Valves
  - Tricuspid (Right)
  - Bicuspid (Left)
- Pulmonary Valve
  - between RV + lungs
- Aortic Valve
  - Between LV + body

Pacemaker -cells that stimulate heart muscle to contract (pump)



Pacemaker

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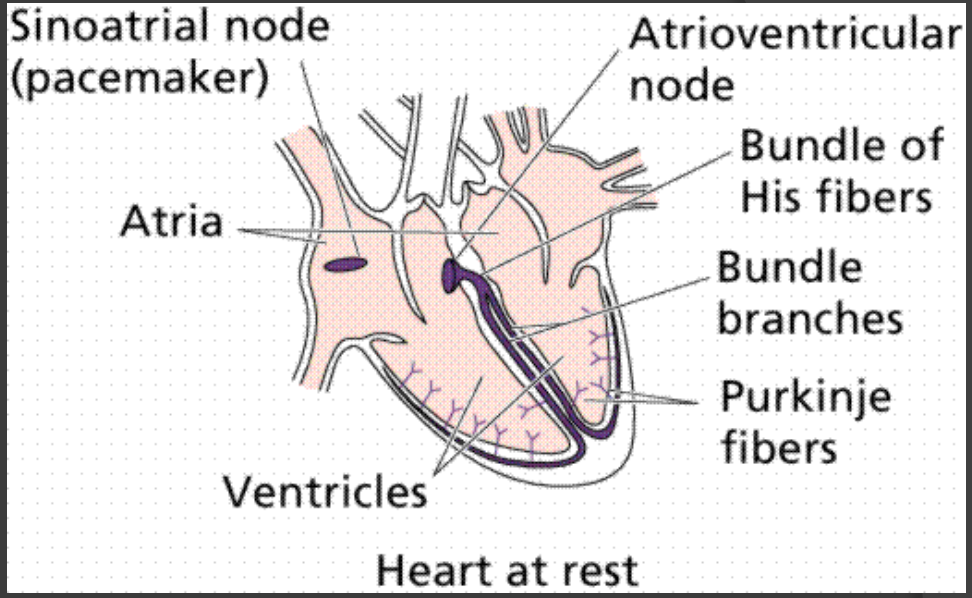
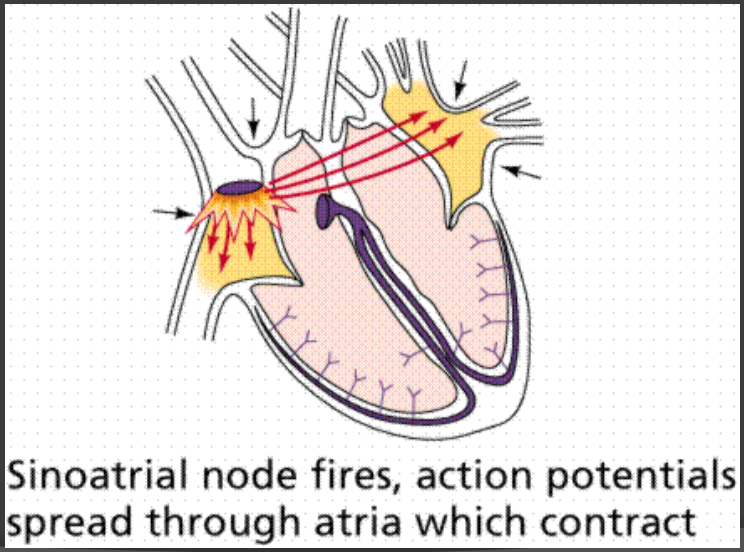
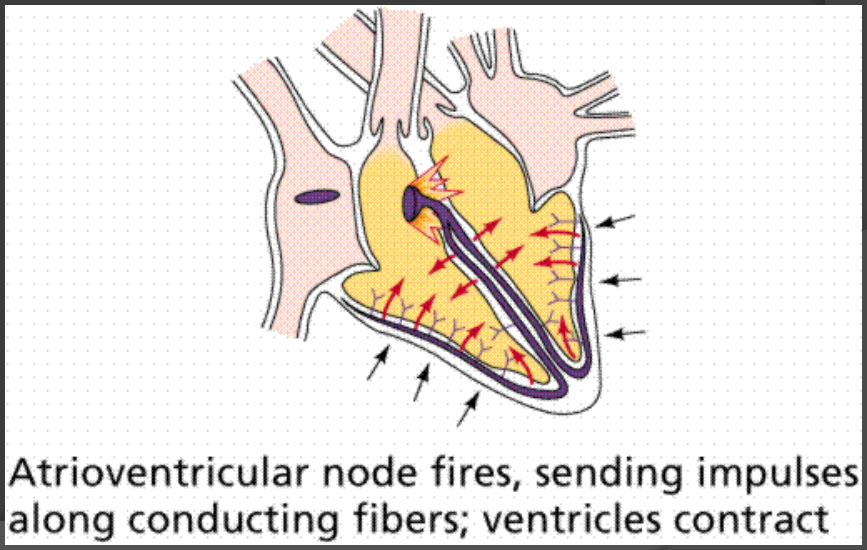
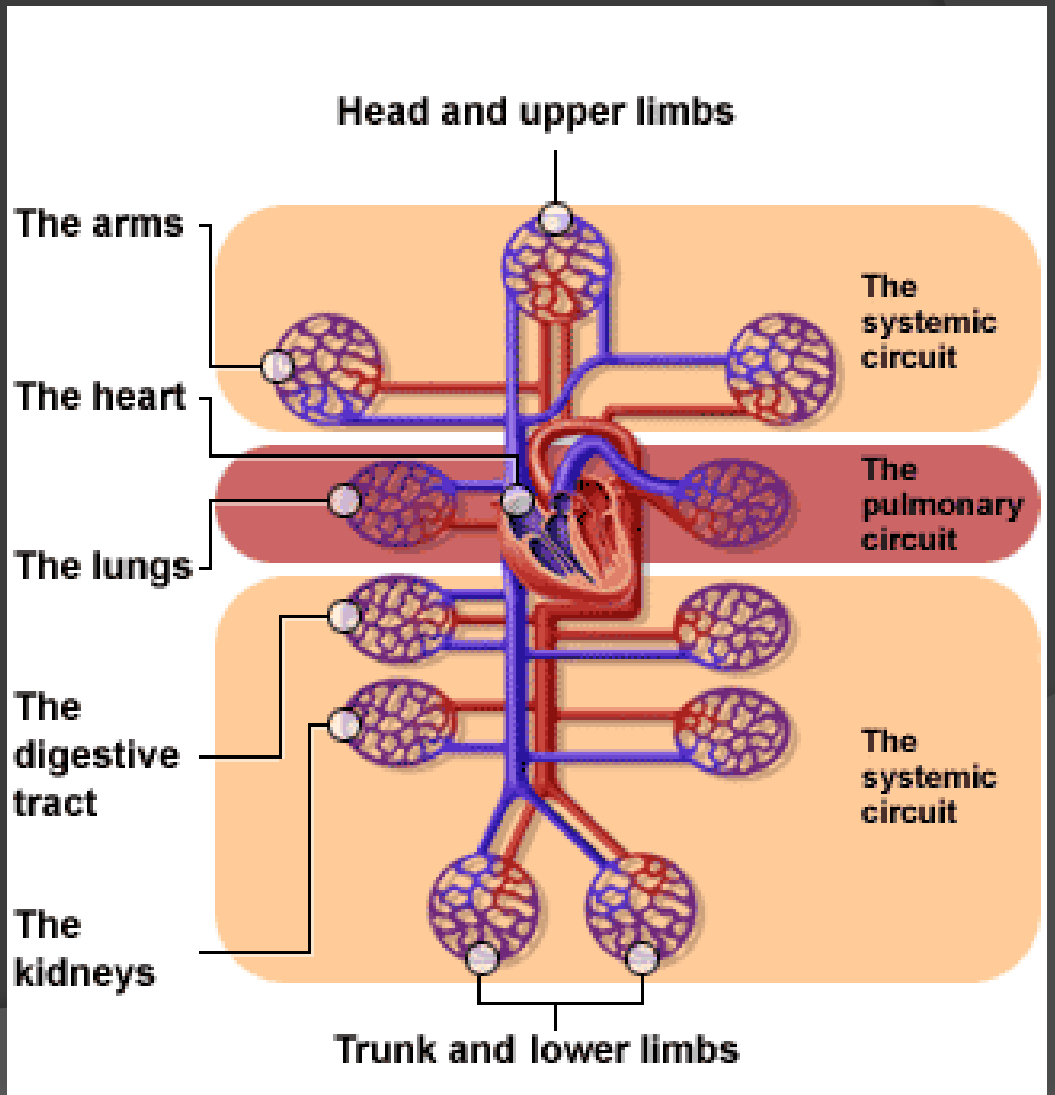






Circulatory Pathways

1. _____ - lungs and heart
2. _____ - heart itself
3. _____ - all other systems



Arteries

- Carry blood
- Thick, elastic walls lined with smooth muscle
- _____
  - alternating expansion + contraction of artery walls

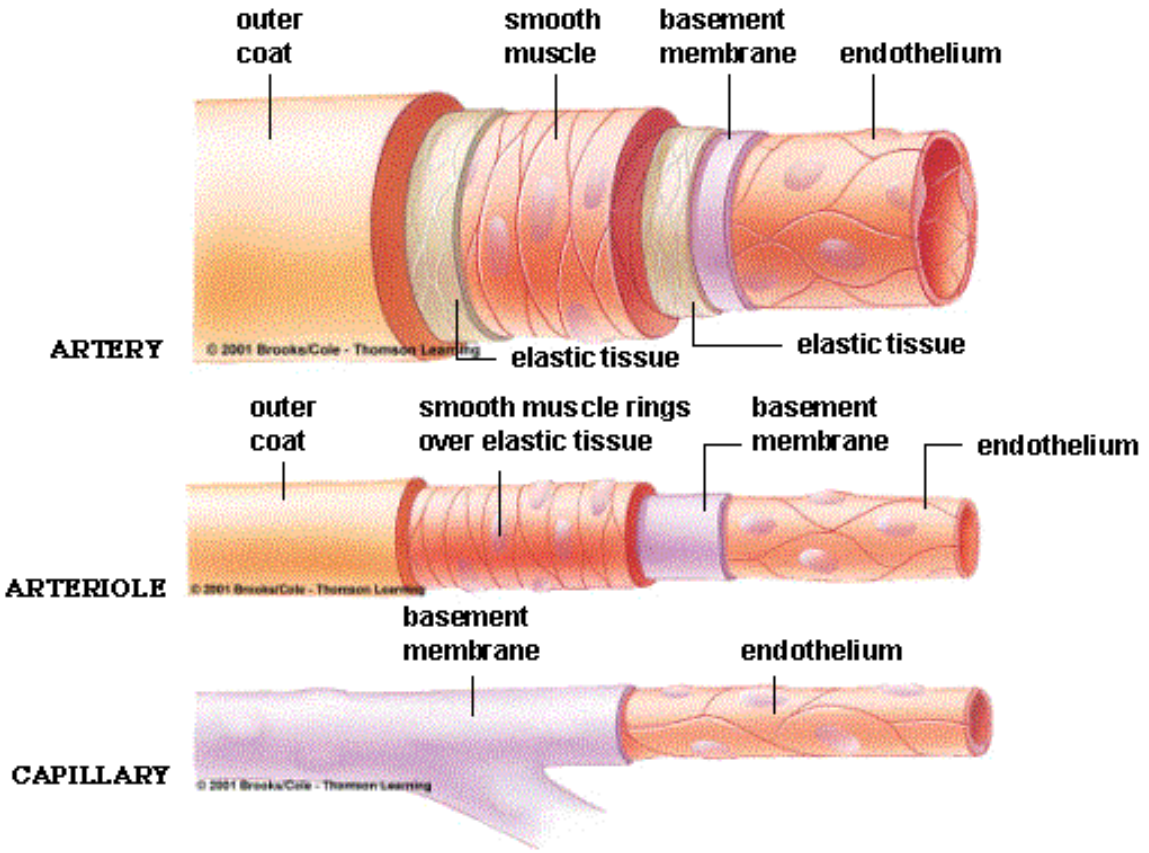
Arteries

Blood Vessels

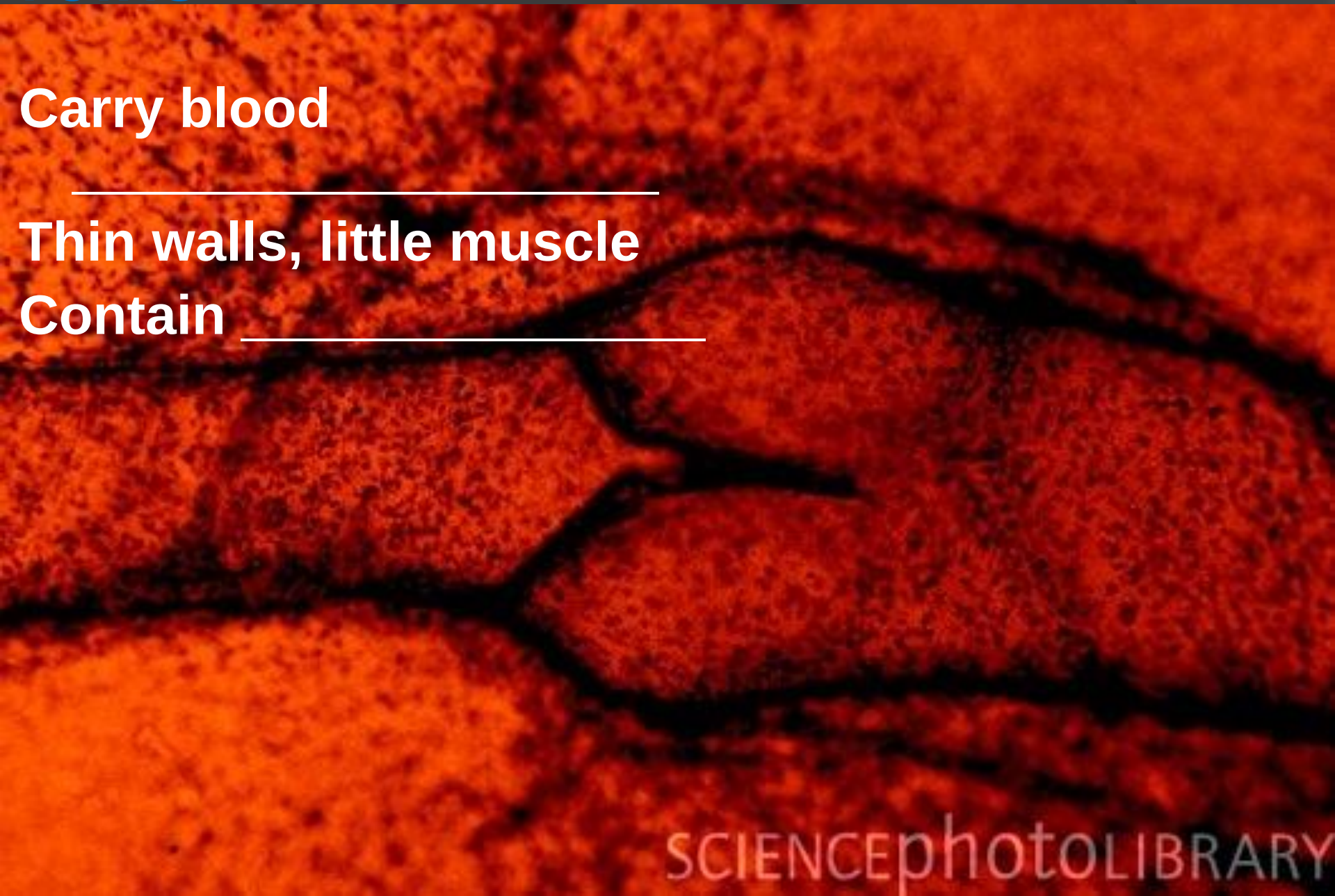
Arteries: main transporters of oxygenated blood

Arterioles: diameter is adjusted to regulate blood flow

Capillaries: diffusion occurs across thin walls



Veins



Carry blood _____

Thin walls, little muscle

Contain _____

Capillaries

Tiniest vessels

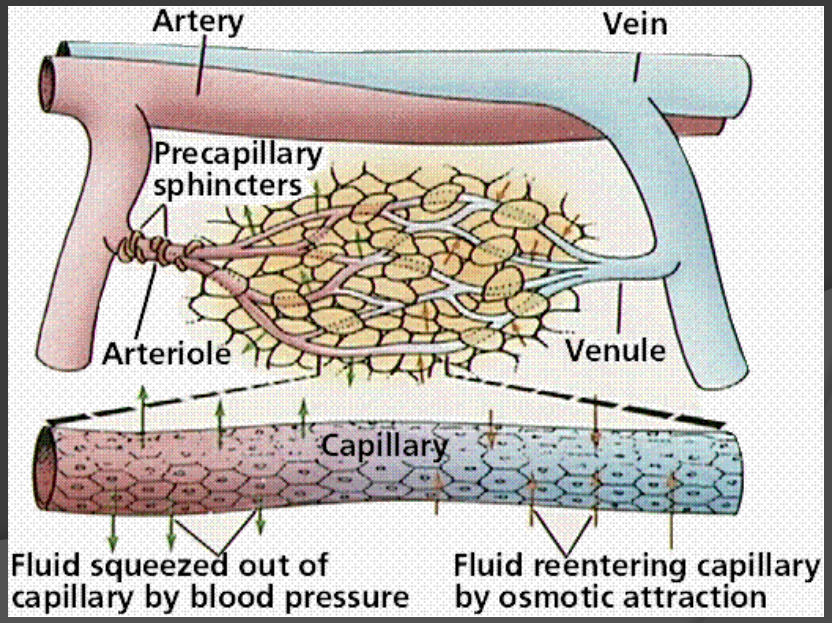
Connect arterioles and venules

Walls _____

Provide surface for material exchange

Diffusion

Molecules move from high concentration areas to low



Capillaries

Blood Pressure

Pressure on walls of arteries

Systolic = pressure when ventricles are

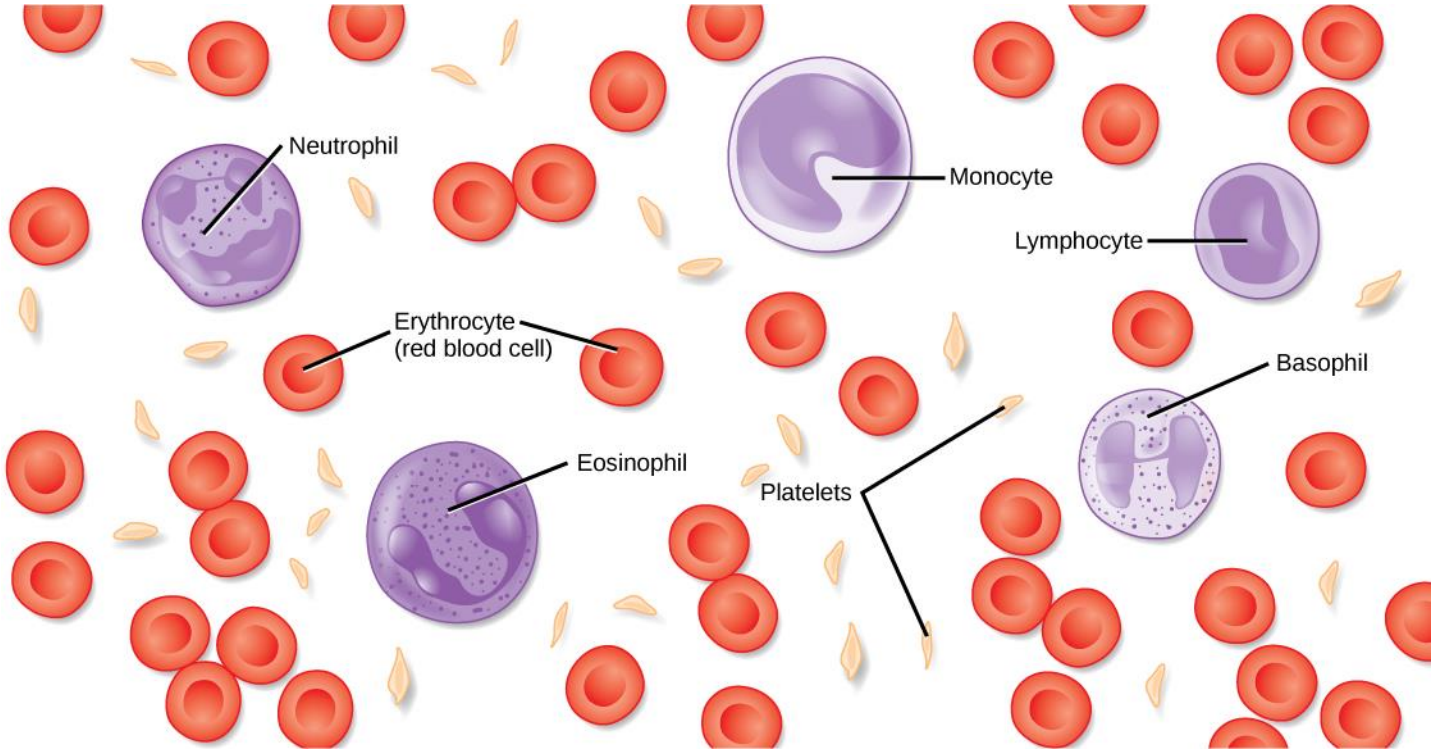
_____

Diastolic = pressure when ventricles are

_____

Normal = 120/80

Section 2
Blood + Lymph



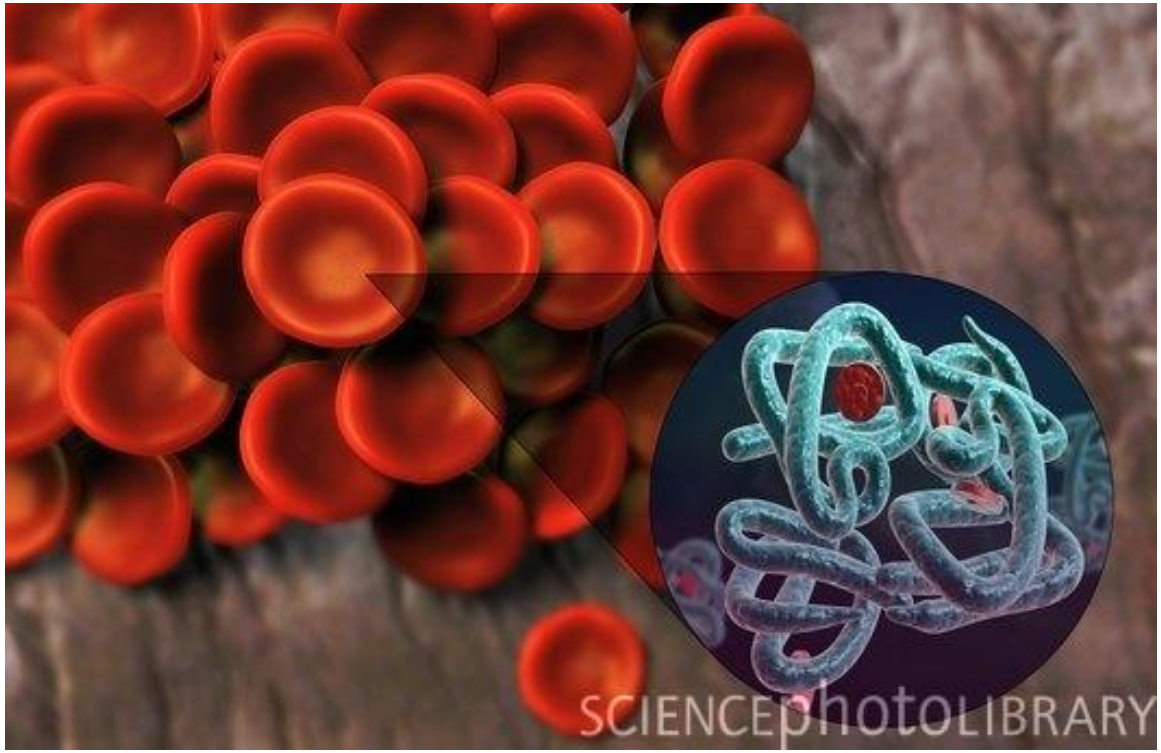
Plasma

Plasma = _____

- _____of plasma is made up of water
- Contains nutrients, hormones, clotting factors, & wastes
- Cells = _____

Red Blood Cells

- Carry oxygen
  - _____ = protein that carries iron (Fe) a chemical that binds oxygen (O_2)
- Live 120 days
- Made in _____
- Broken down by liver & spleen



White Blood Cells

- Fight disease

pictured: white blood cell attacking Staphylococcus (Staph) bacteria

- Contain a nucleus
- Made in red bone marrow & lymph glands
- Can live hours, days, months & even years!

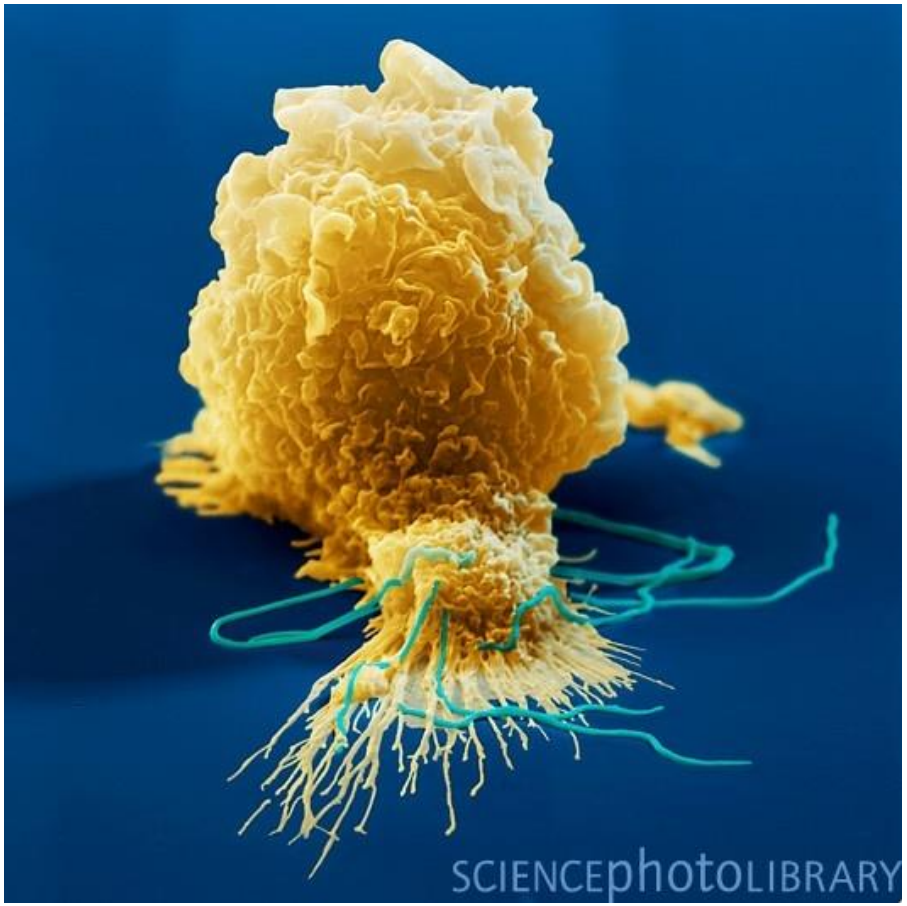
<u>Types of White Blood Cells:</u>

A. Phagocytes

B. Lymphocytes

Types of White Blood Cells

A. Phagocytes (Pac-men)
eat up foreign materials

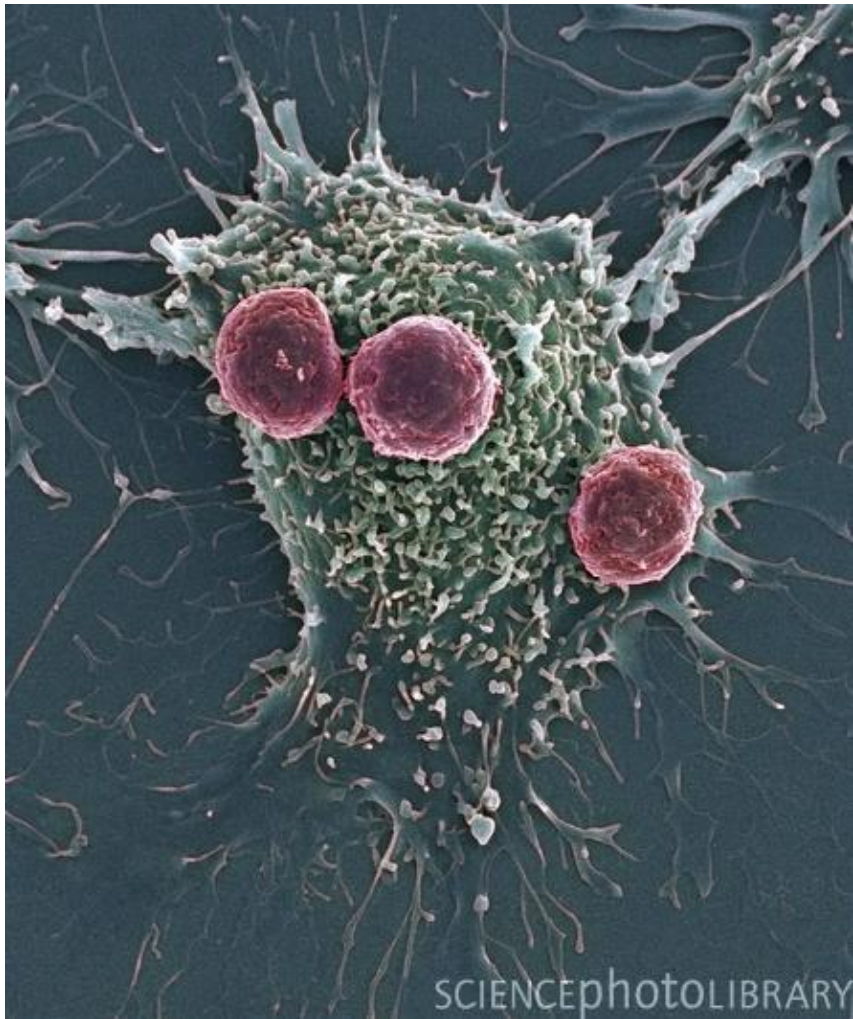


**pictured: Macrophage eating bacteria*

Types of White Blood Cells

B. Lymphocytes

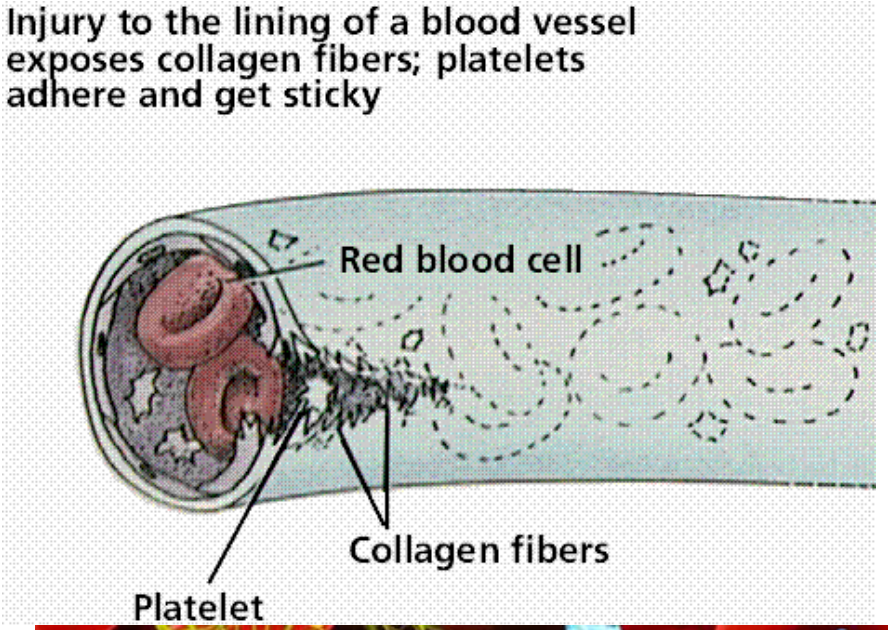
- _____- make antiBodies that destroy antigens(germs)
- _____- help phagocytes and B cells and remember antigens

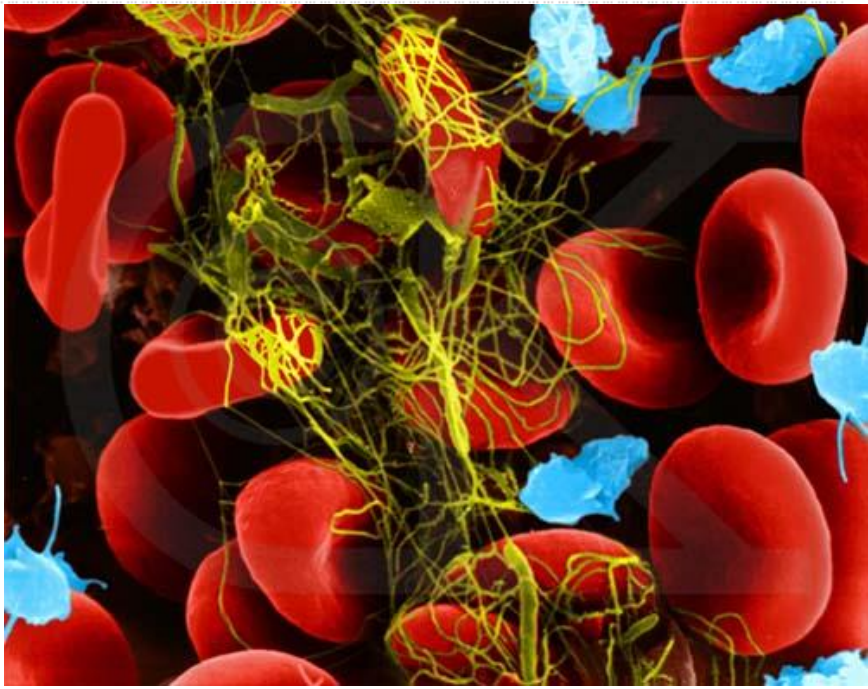


**Pictured: T lymphocytes attacking cells*

Platelets –

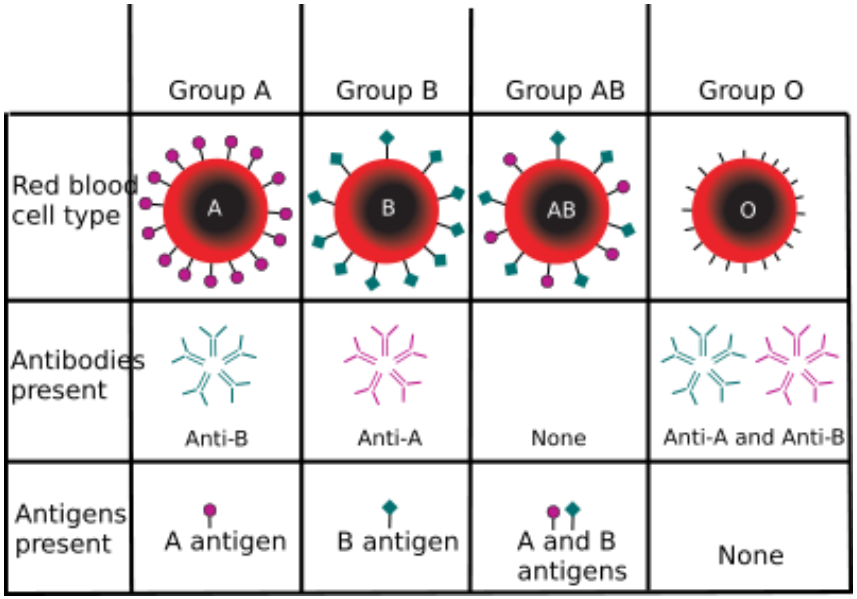
- 4 Steps involved:
  1. platelets gather
  2. fibrin produced
  3. net traps cells
  4. clot forms





Blood Types and Transfusions

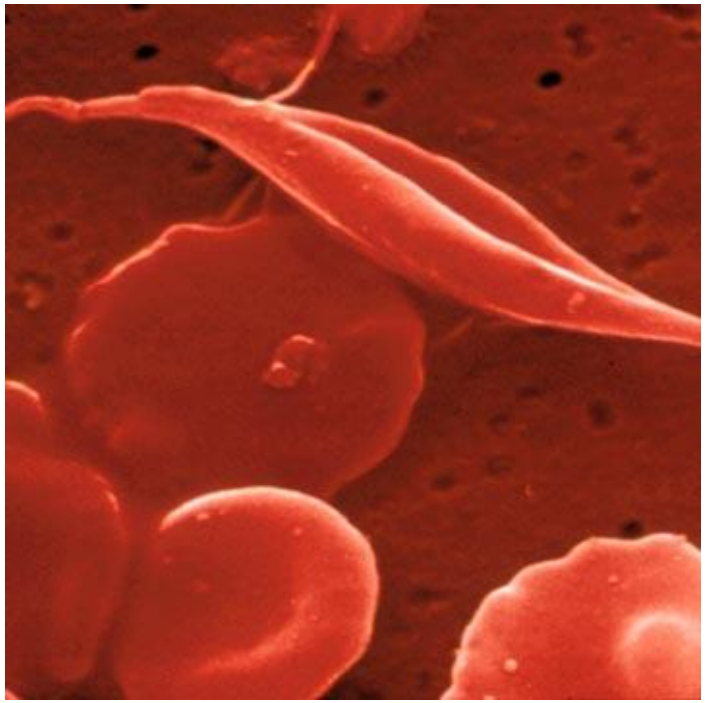
- Blood types determined by presence of _____ on RBCs
  - A, B, AB, and O
- Rh Factor
  - additional protein determines _____
- Foreign proteins cause clot formation.
- Transfusion video from CancerCenter
- Blood Detectives



Diseases and Disorders

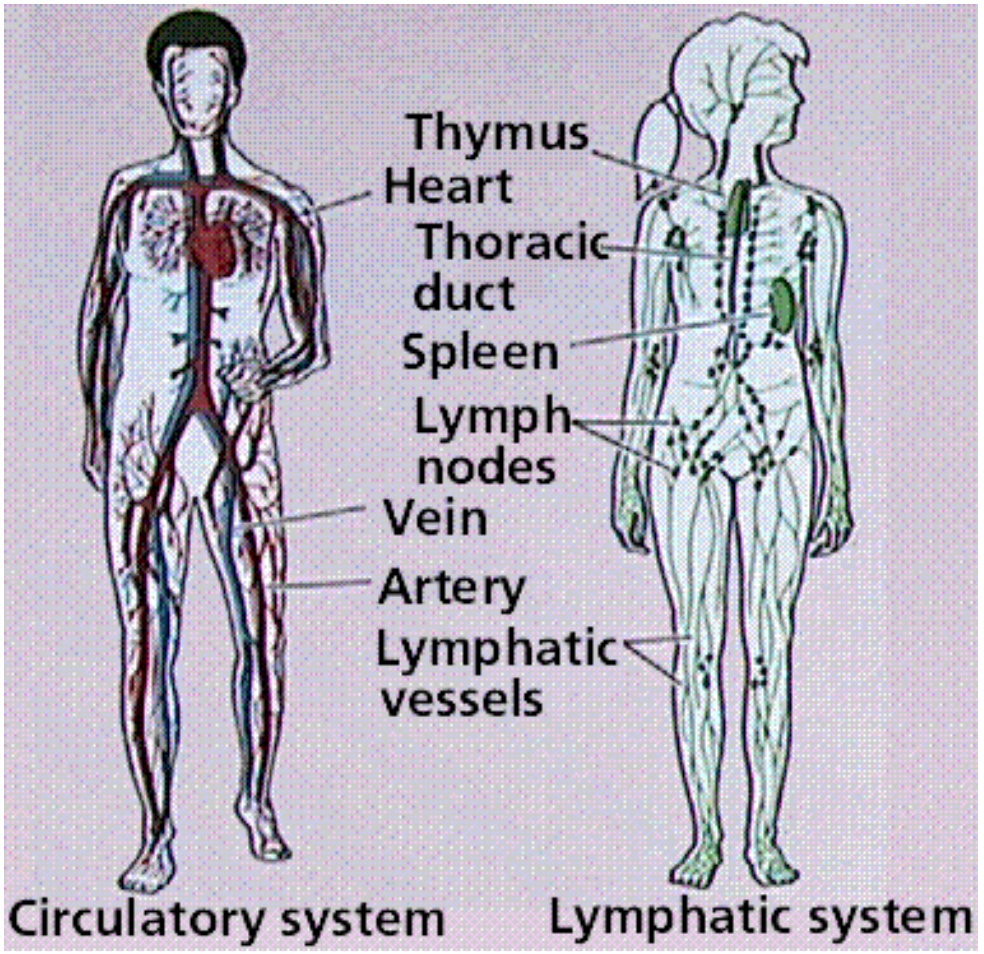
- _____ - not enough _____
  - low or defective RBC or hemoglobin
- Leukemia - _____ means too many WBCs
  - bone marrow transplants
- _____ Anemia
  - misshapen RBC
- AIDS
  - virus infects

  _____



Lymphatic **System**

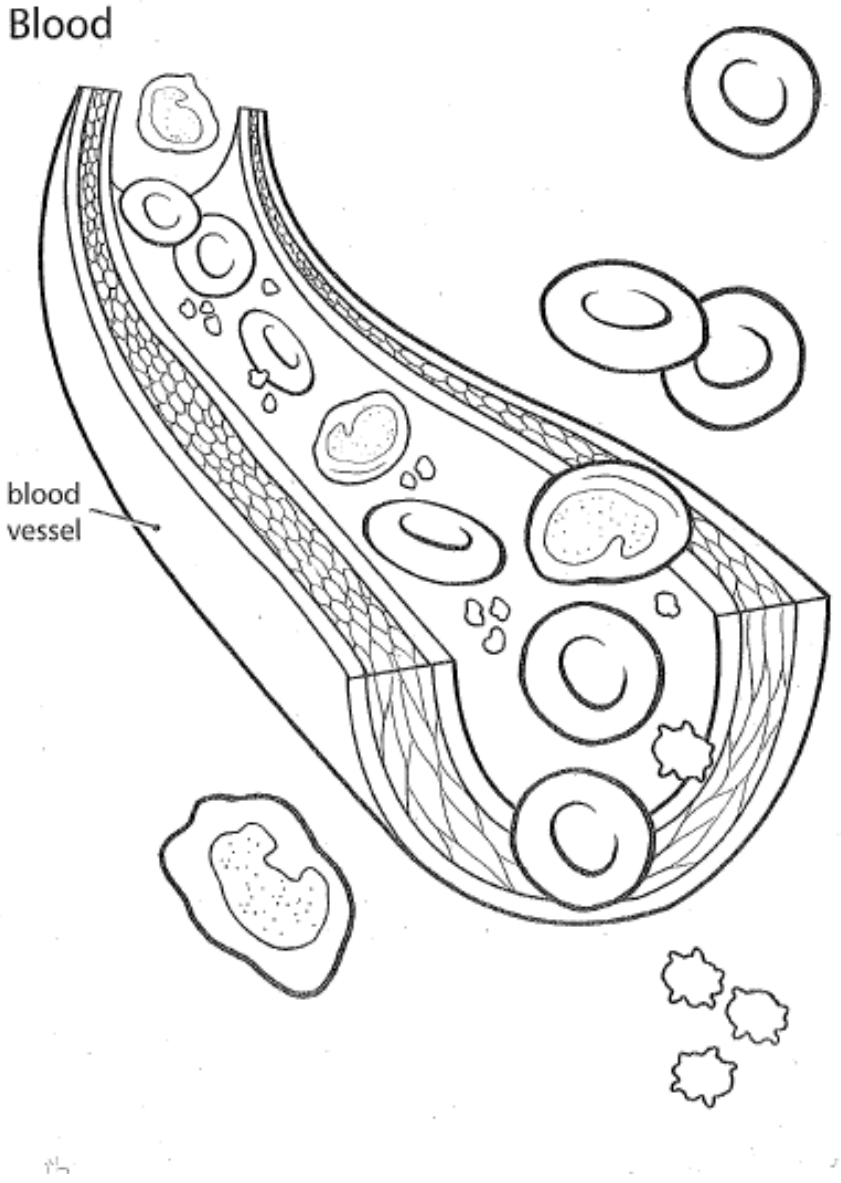
- Collects fluid from tissue & returns it to blood
- Lymph
  - fluid contains water, glucose, WBC
- Lymph Nodes
  - Filters lymph and traps bacteria



Quiz yourself!

Label blood components

Which has hemoglobin? Which clots blood? Which fights disease? What type of muscle in the blood vessel?

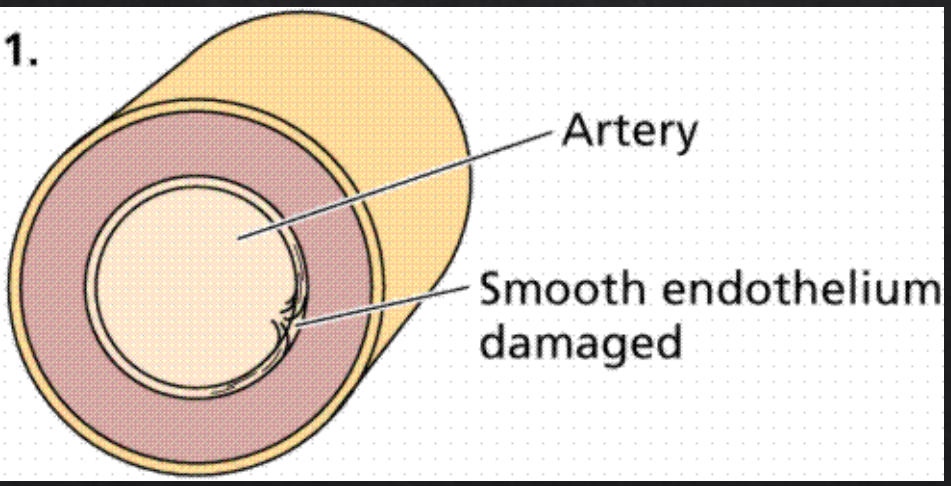


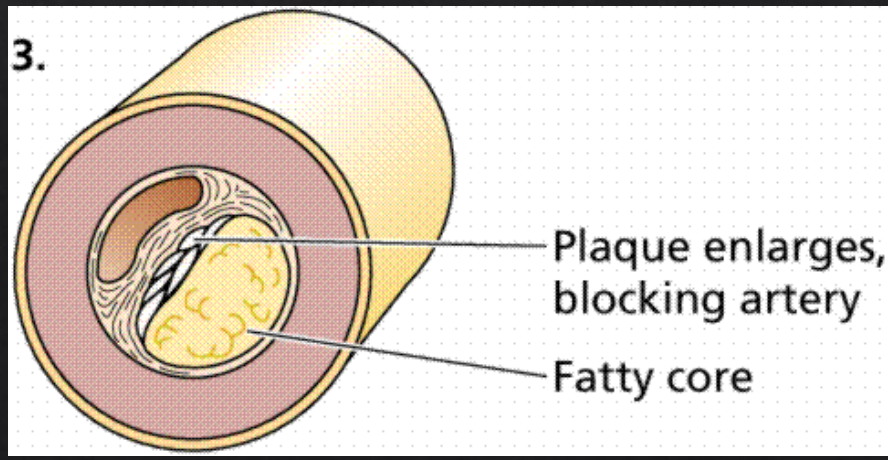
Section 3 Cardiovascular Health

Heart Disease

- **Major cause of death in US**
- **_____**
  - **high blood pressure**
  - **One indicator of possible heart disease**

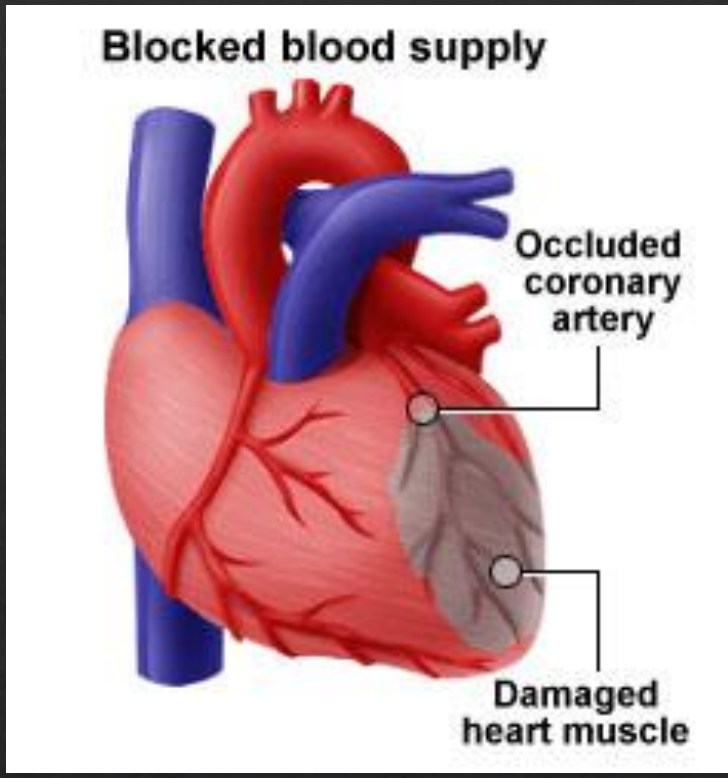
- build up of plaque (_____) on artery walls:
  - block in coronary arteries - heart attack
  - block in brain arteries - stroke

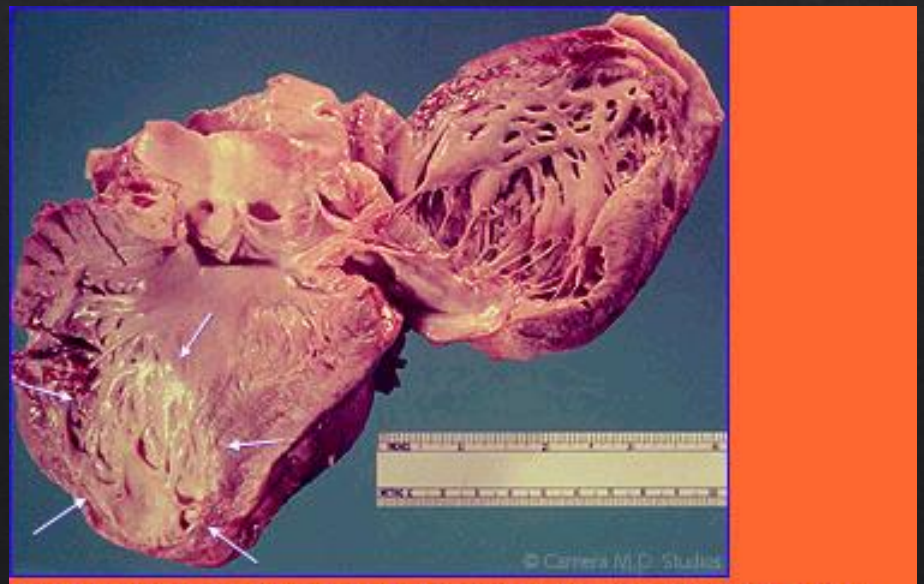




Heart Attack

- _____to part of the heart muscle becomes _____
- Causes _____ damage, but not always death

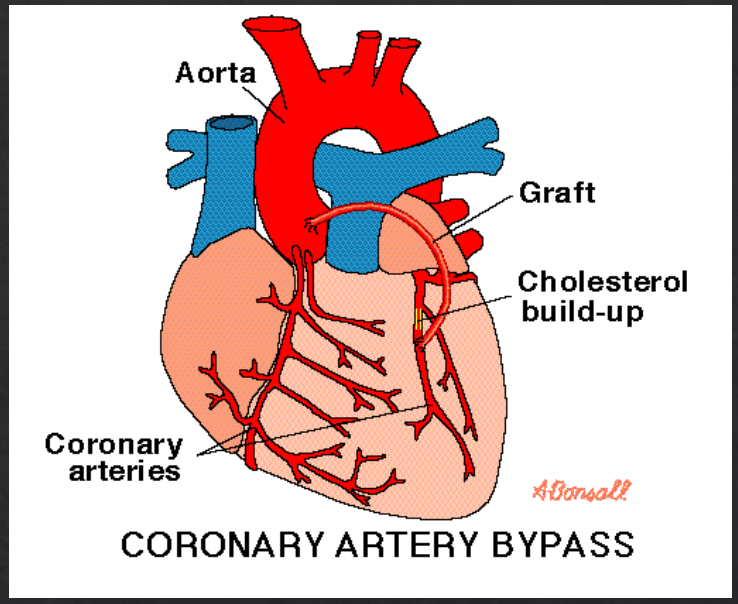




The arrows point to the site of a heart attack, where the heart muscle has died from oxygen deprivation. Normally, the area would look pink.

Bypass Surgery

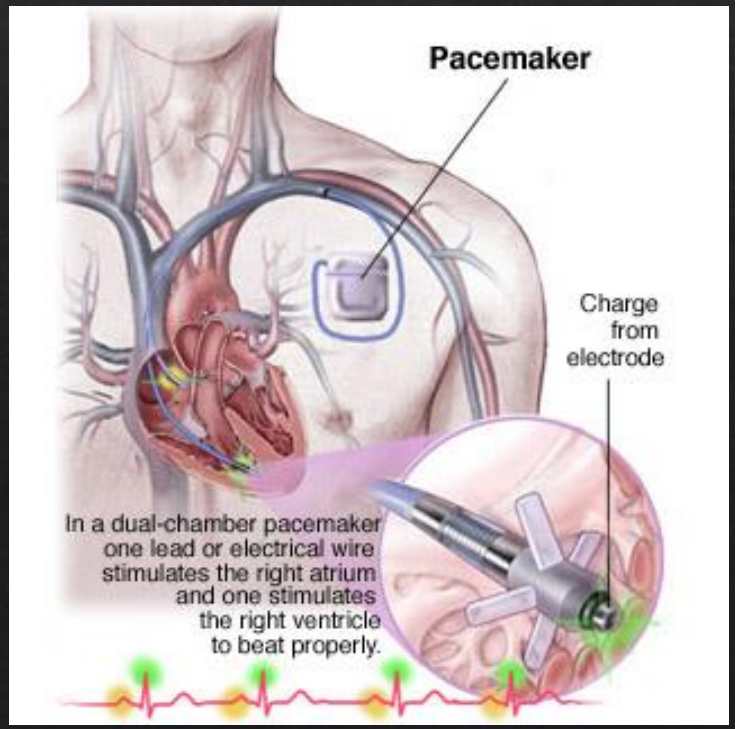
- Surgery to create a detour past blocked arteries



Pacemaker

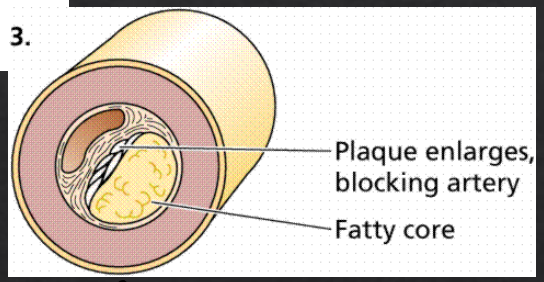
- _____

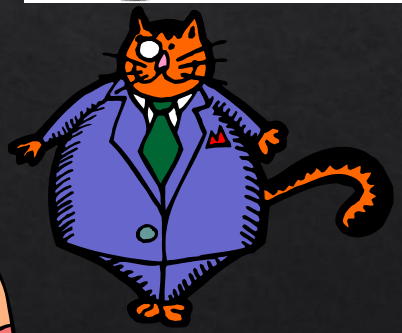
heart beat stimulator



Controllable Risk Factors

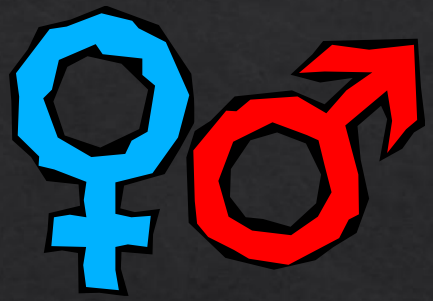
- high blood _____
- high blood _____
- _____
- _____
- physical inactivity
- _____





Uncontrollable Risk Factors

- gender
- heredity
- age



Quiz:

- What causes a heart attack?
- What is a indicator of heart disease?
- True or false: An artificial pacemaker replicates what nerve cells in the heart should do.
- True or false: People can control some risks of heart disease.
- A _____ is caused by a blockage in the brain, which means the brain tissue isn't getting oxygen.
- Bypass surgery uses a patient's own vessels to _____ a blocked coronary artery.

Quiz:

- What causes a heart attack? Blocked coronary arteries
- What is a indicator of heart disease? Hypertension
- True or false: An artificial pacemaker replicates what nerve cells in the heart should do.
- True or false: People cannot control some risks of heart disease.
- A stroke is caused by a blockage in the brain, which means the brain tissue isn't getting oxygen.
- Bypass surgery uses a patient's own vessels to go around a blocked coronary artery.