Ch. 17: BLOOD
Ch. 18: HEART
Ch. 19: BLOOD VESSELS

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Homeostatic Imbalances of Erythrocytes

H. I.	Description
Anemia	blood with low O2 carrying capacity
Polycythemia	too many RBC, > viscous
Blood doping	removal of rbc and reinjected

Homeostatic Imbalances of Leukocytes

H.I.	Description
Leukopenia	Low wbc count from excess glucocorticoids or anticancer drugs
Leukemia	red bone marrow becomes filled with cancerous leukocytes, <RBC & <platelets

Homeostatic Imbalances of Thrombocytes

H.I.	Description
Thrombocytopenia	< platelets causing spontaneous bleeding Caused by red bone marrow malfunction, cancer or drugs
Hemophilia	Hereditary bleeding disorder

CH 18- The Heart

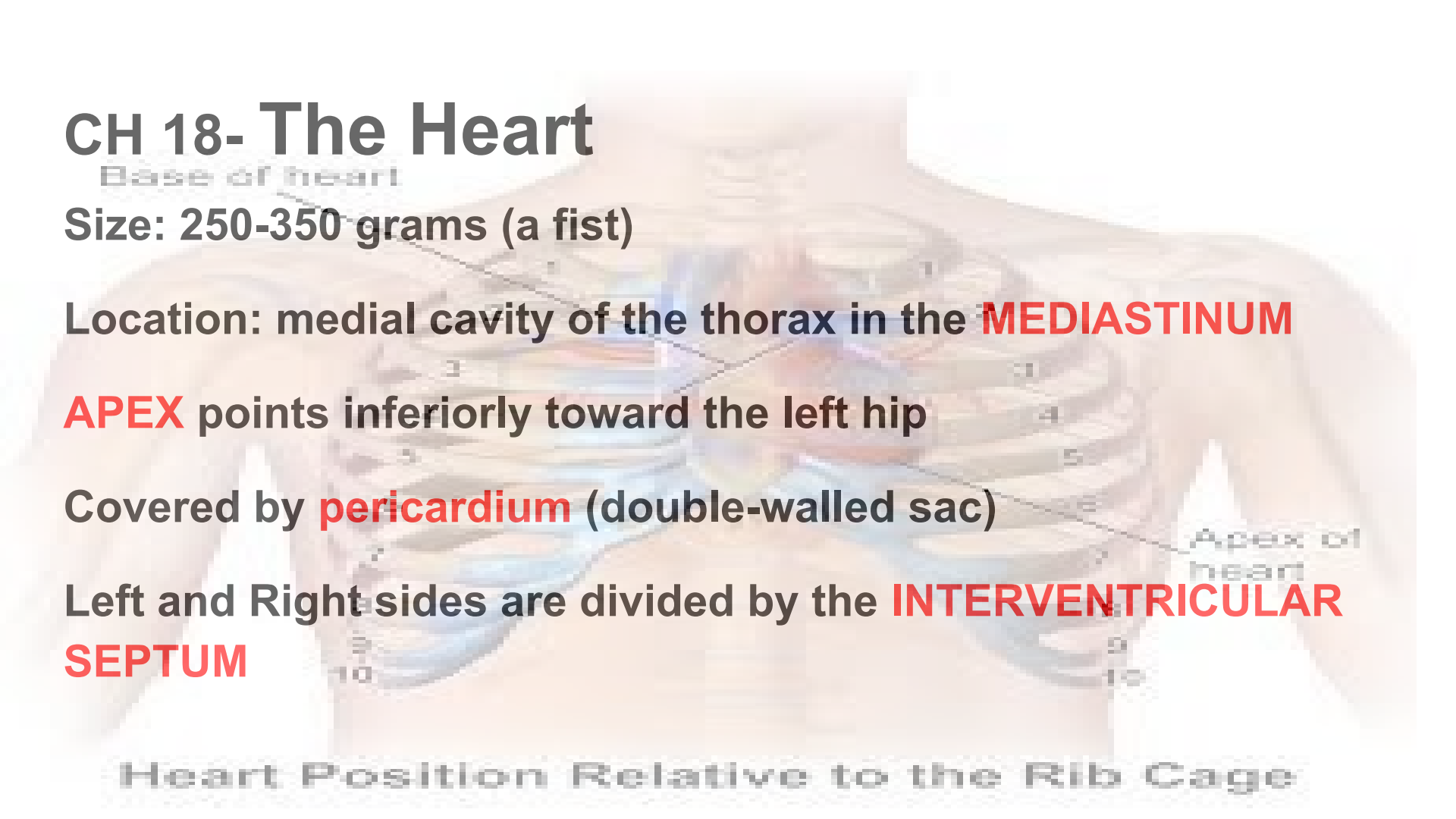
Size: 250-350 grams (a fist)

Location: medial cavity of the thorax in the MEDIASTINUM

APEX points inferiorly toward the left hip

Covered by pericardium (double-walled sac)

Left and Right sides are divided by the INTERVENTRICULAR SEPTUM



Heart is layered like an onion…..

Layers of cardiac muscles:

- Epicardium- outer
- Myocardium- middle; does all of the contracting
- Endocardium- inner

The Heart is a pump that maintains BP

Bp works like diffusion:

- **Generates HIGH HYDROSTATIC PRESSURE out of the heart**
- **Creates LOW PRESSURE to bring blood back in**
- **‘Lub-dub’ sounds → tricuspid and mitral valves closing**

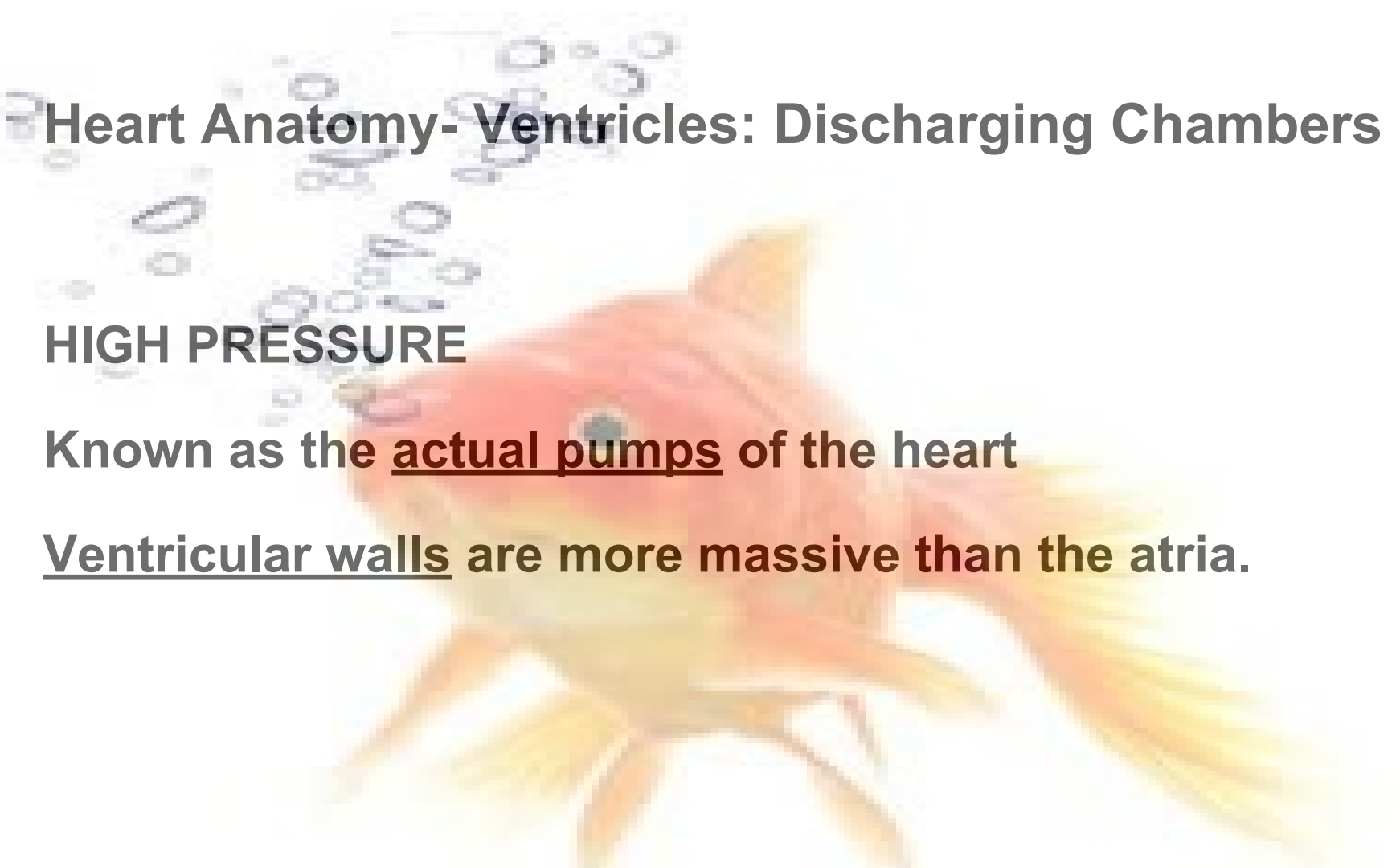
Heart Anatomy- Atria: Receiving Chambers

LOW PRESSURE

3 VEINS: Superior & Inferior Vena Cava, Coronary Sinus

4 Pulmonary veins are paired on both sides: transport blood from lungs back to the heart

Heart Anatomy- Ventricles: Discharging Chambers



HIGH PRESSURE

Known as the actual pumps of the heart

Ventricular walls are more massive than the atria.

Blood Flow

- Simultaneously uses 2 circuits:
  - Pulmonary and Systemic
- Blood moves in a *Figure 8* motion: Heart → lung → heart → body → heart
- Using Hi-Pressure, Low-pressure gradient regulated by heart valves

BLOOD ENTERS THE R. ATRIUM FROM 3 VEINS

1. Superior Vena Cava: blood received from parts of the body higher than the heart, head and arms

2. Inferior Vena Cava are major veins that gets its blood from the parts of the body below the heart, torso and legs.

Coronary Sinus collects blood draining from myocardium

PULMONARY CIRCULATION LOOP: CO2 is exchanged for O2

3.R. ventricle →4.Pulmonary semilunar valve → 5.Pulmonary trunk →6. L/R Pulmonary arteries →7.Lungs → 8.Capillaries →9. L/R Pulmonary veins→ 10.Left atrium → 11.Mitral valve → 12.Left ventricle

SYSTEMIC LOOP: circulates O2 to all cells

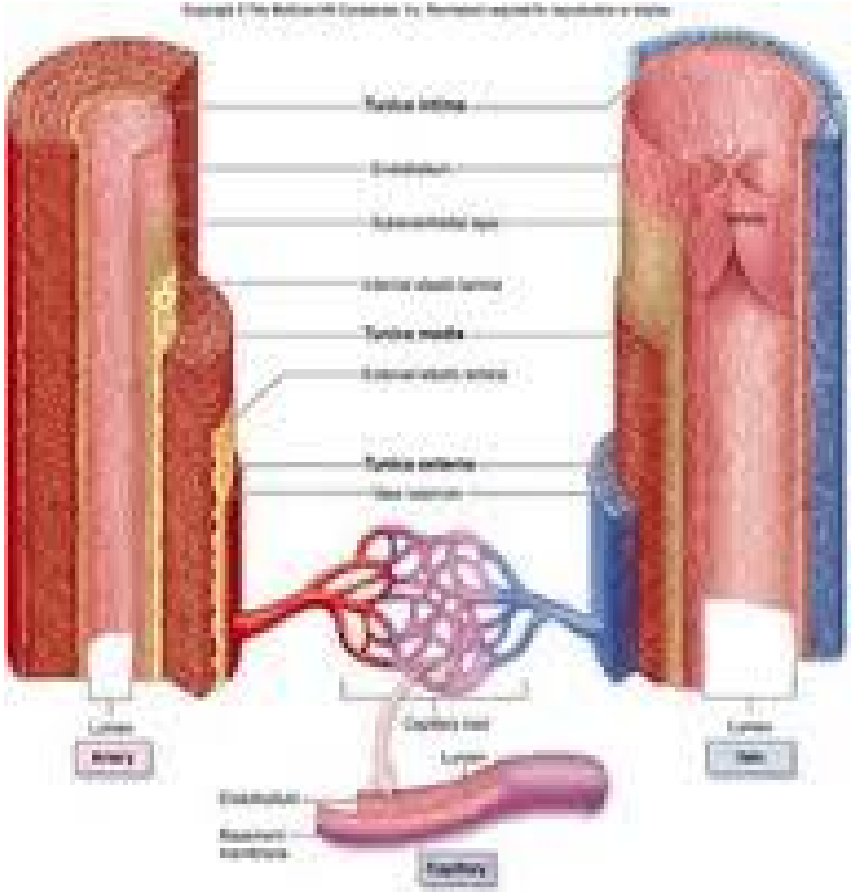
13.Aortic Semilunar Valve → 14.Aorta → 15. cells → 16.deoxygenated blood → 17.Heart → 18.Superior → 19. Inferior Vena Cava veins → 20. R. Atrium→ 21.Tricupsid Valve

Ch. 19- Blood Vessels

3 types: arteries, capillaries and veins

3 tunics (layers) in arteries and veins

- **Tunica Intima → LUMEN**
- **Tunica Media**
- **Tunica Externa**



Vessels

ARTERIES:

Carries blood AWAY from the heart

VEINS:

carry blood TO the heart

CAPILLARIES:

Saturates organs and tissue

WHAT AFFECTS BLOOD FLOW & BLOOD PRESSURE?

- **BLOOD VISCOSITY- diabetes, medications, age**
- **BLOOD VESSEL DIAMETER- plaque build up**
- **VESSEL ELASTICITY- rigid, thick walls**

Why is the Spleen the ‘Graveyard’ for RBC ?

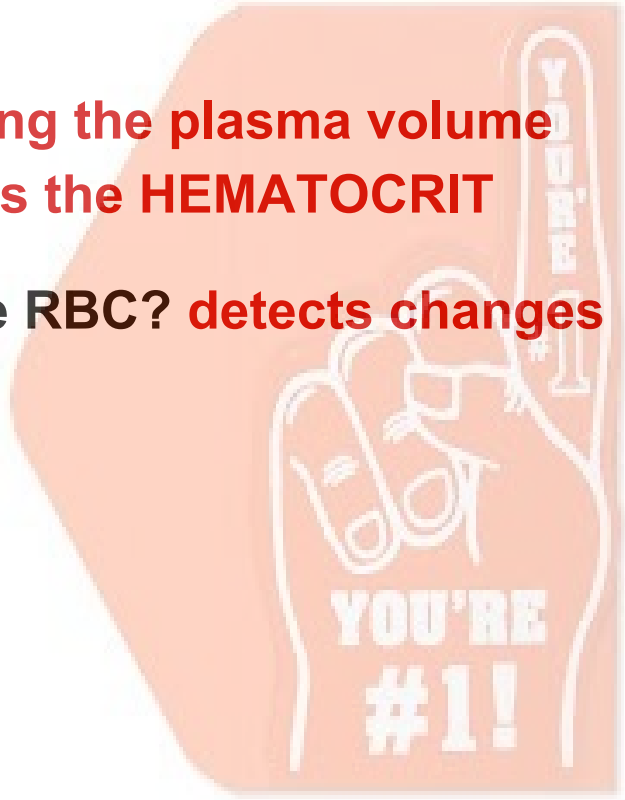
The spleen purifies blood by removing microbes and worn out or damaged rbc

If the spleen is removed, the liver would take over the spleen’s job

Why are the kidneys an important role in the Circulatory System?

Kldneys regulate blood volume by controlling the plasma volume and in red blood cell mass, which influences the HEMATOCRIT

How are the kidneys signaled to make more RBC? detects changes in tissue oxygen



Blood Pressure Points

1. Temporal→ head
2. Carotid → neck
3. apical→ heart
4. brachial→ forearm
5. radial→ wrist
6. femoral→ groin
7. popliteal→ knee
8. pedal→ foot