

The Cardiovascular System

● Presented by: Doris Cline

Characteristics of Blood Vessels

- ◉ Pulsate
- ◉ Constrict
- ◉ Relax
- ◉ Proliferate

(To grow or multiply by rapidly producing new tissue, parts, cells)

3 Major Types of Blood Vessels

- Arteries
- Capillaries
- Veins

As the heart contracts, where is blood forced to go?

- Large arteries
- Leaving the ventricles
- Then into successively smaller branches, the arterioles (little arteries)
- These feed into capillary beds of body's organs & tissues

Blood drains from capillaries into where?

- Venules (the smallest veins)
- & then on into larger and larger veins that ultimately empty into the heart

Which direction do arteries carry blood?

- ◉ Away from the heart
- ◉ In doing so, they branch or diverge into smaller divisions

How does this differ from veins?

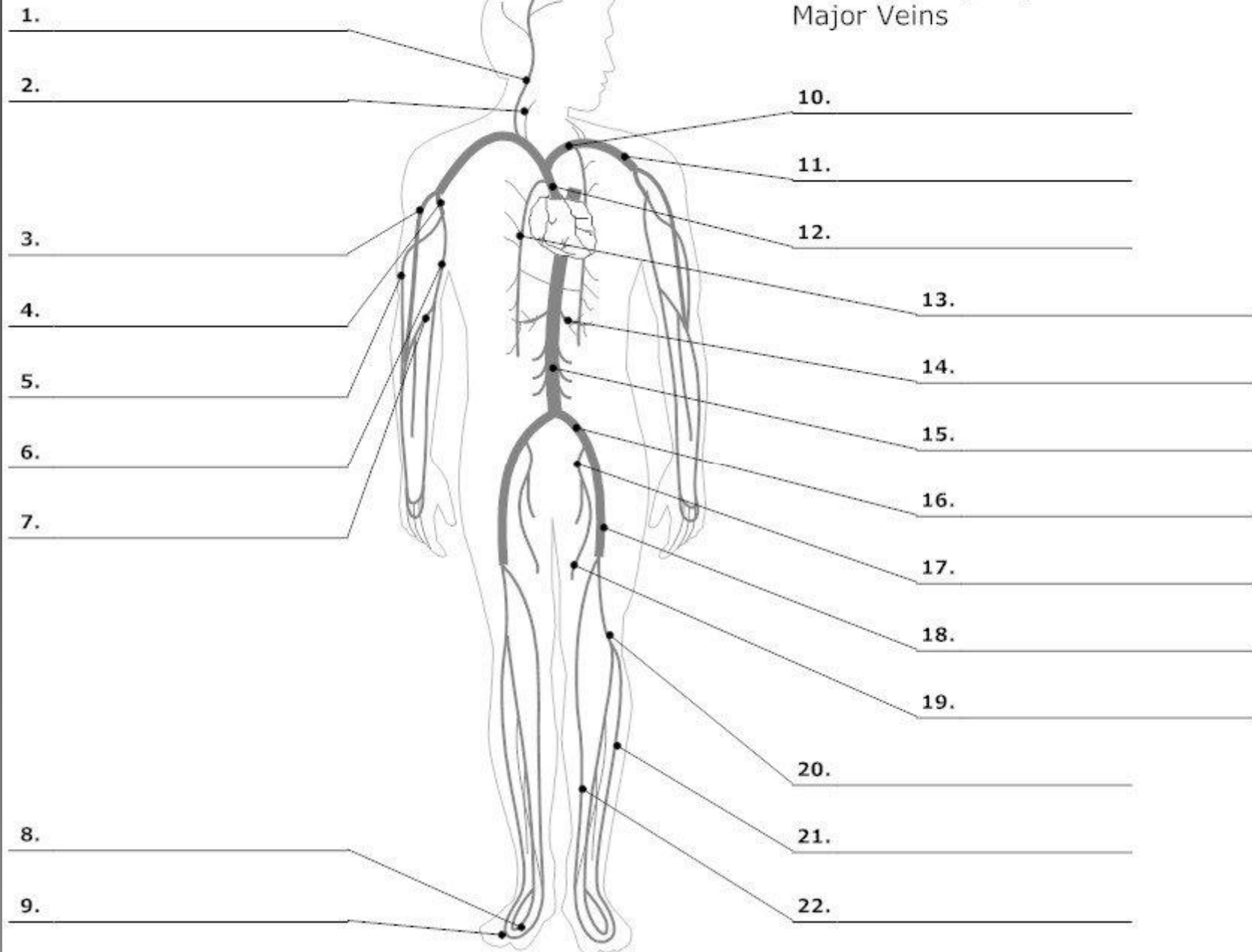
- Veins carry blood toward the heart
- So they join, converge into successively larger vessels approaching the heart

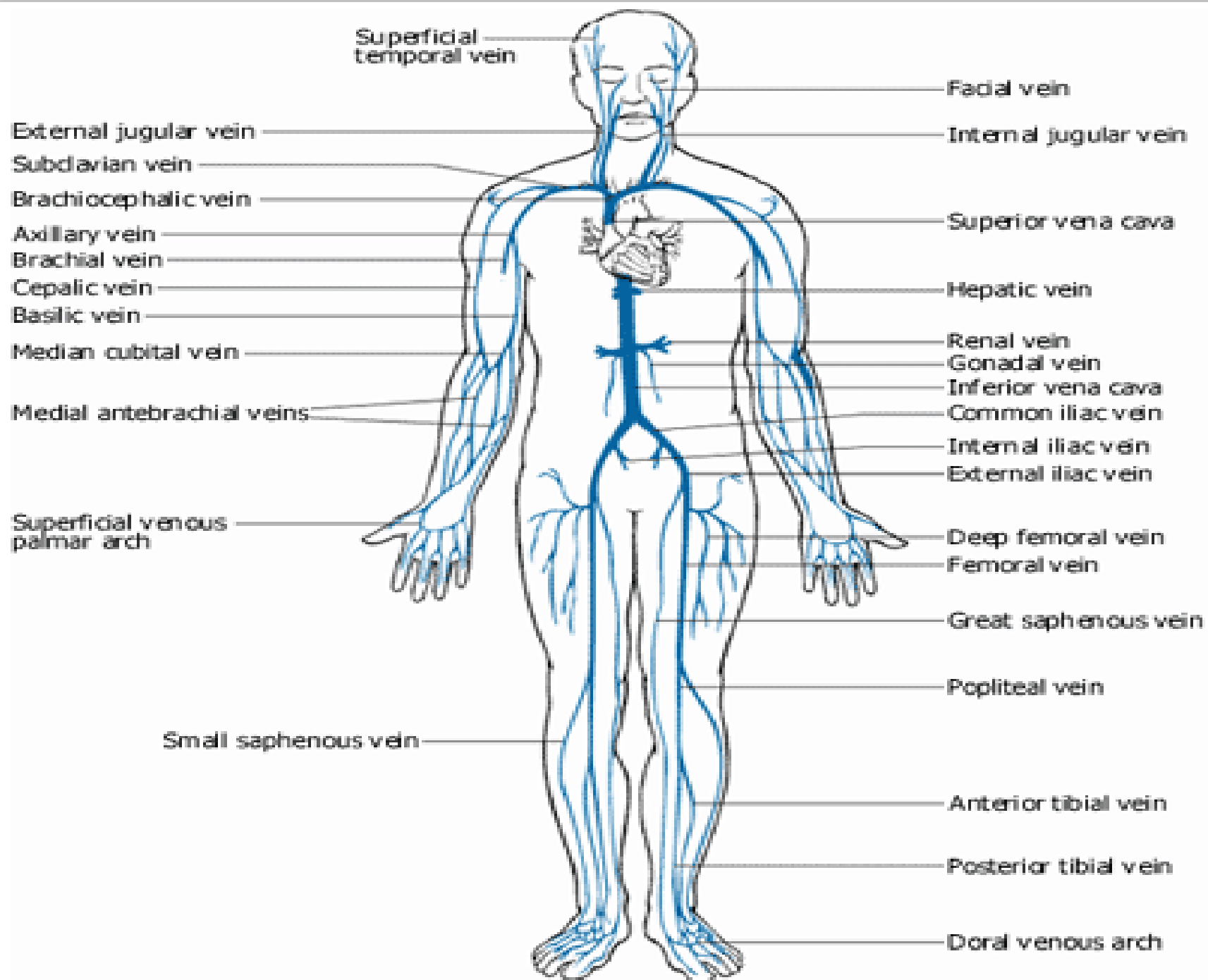
Describe SYSTEMIC circulation

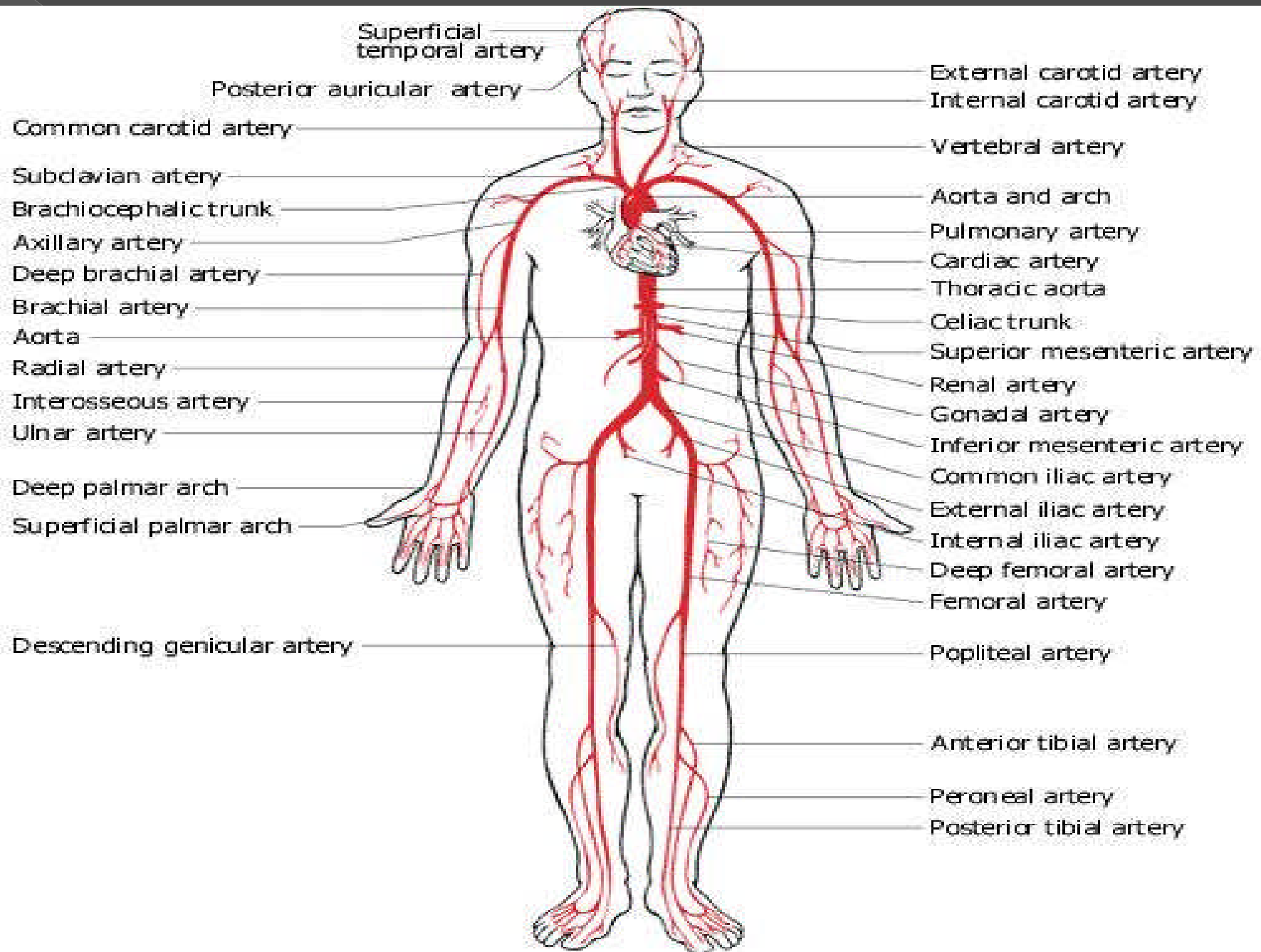
- Arteries carry
- O₂-ated blood
- &
- Veins carry
- O₂-poor blood

Circulatory System

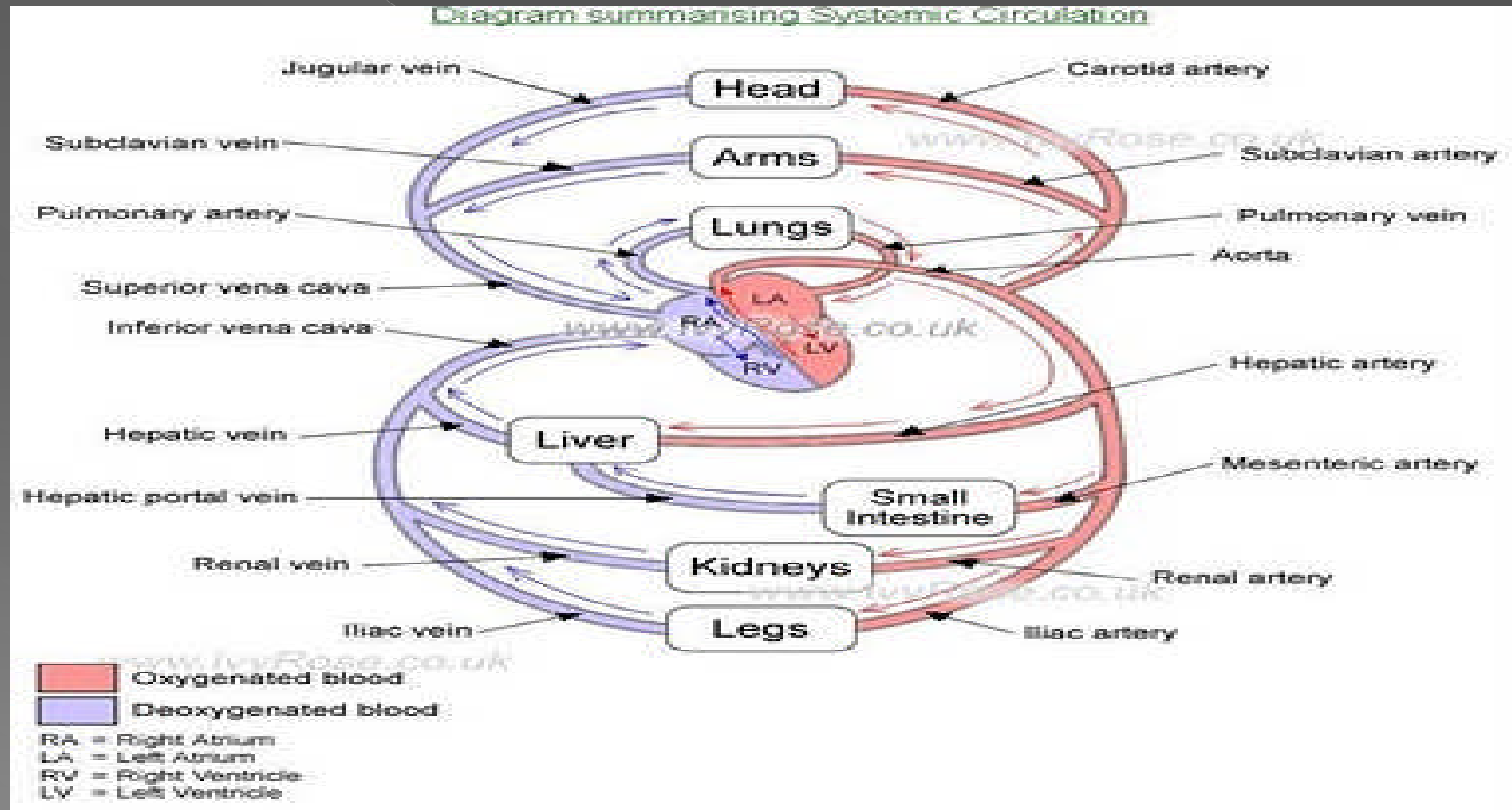
Major Veins







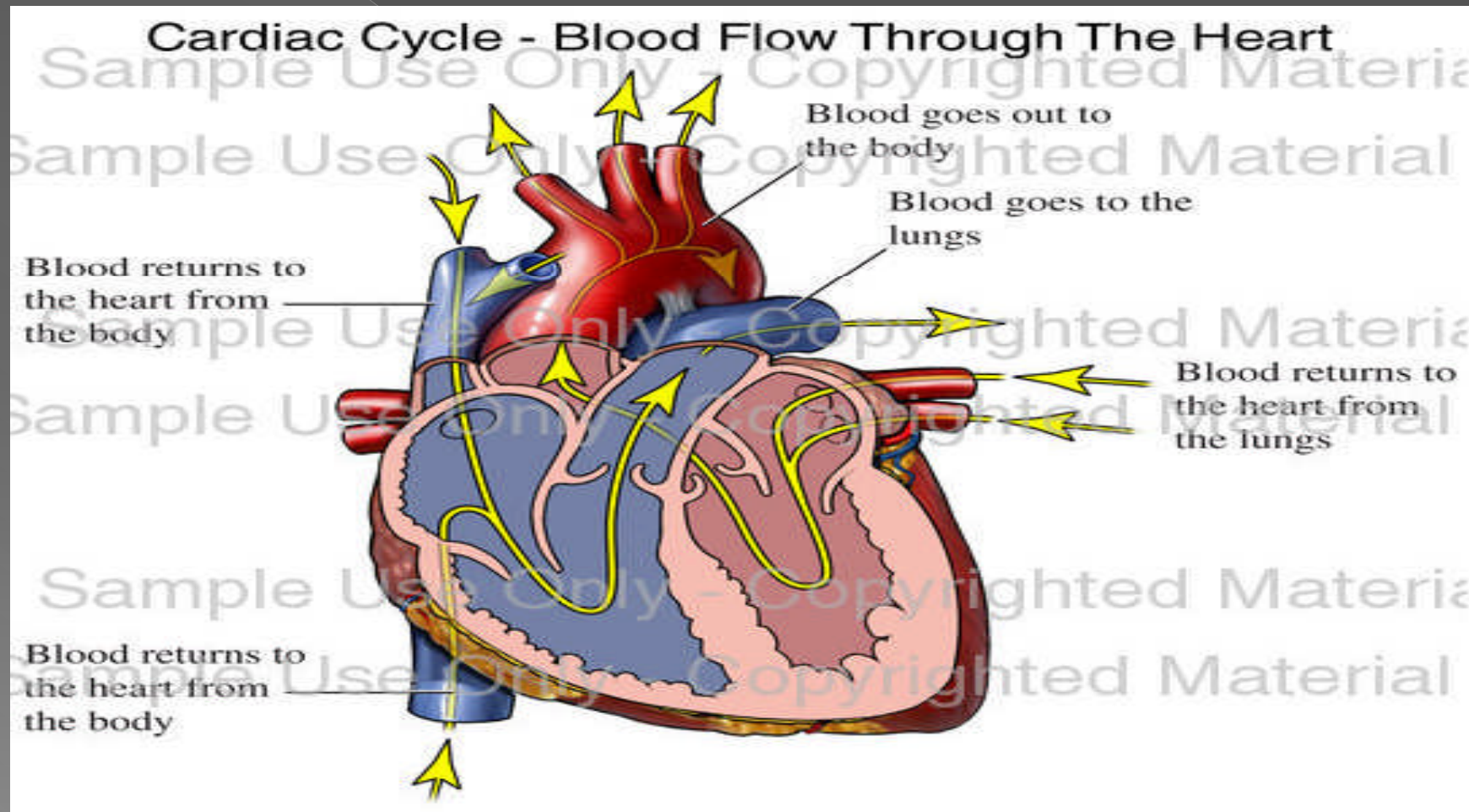
Systemic Circulation Visualized



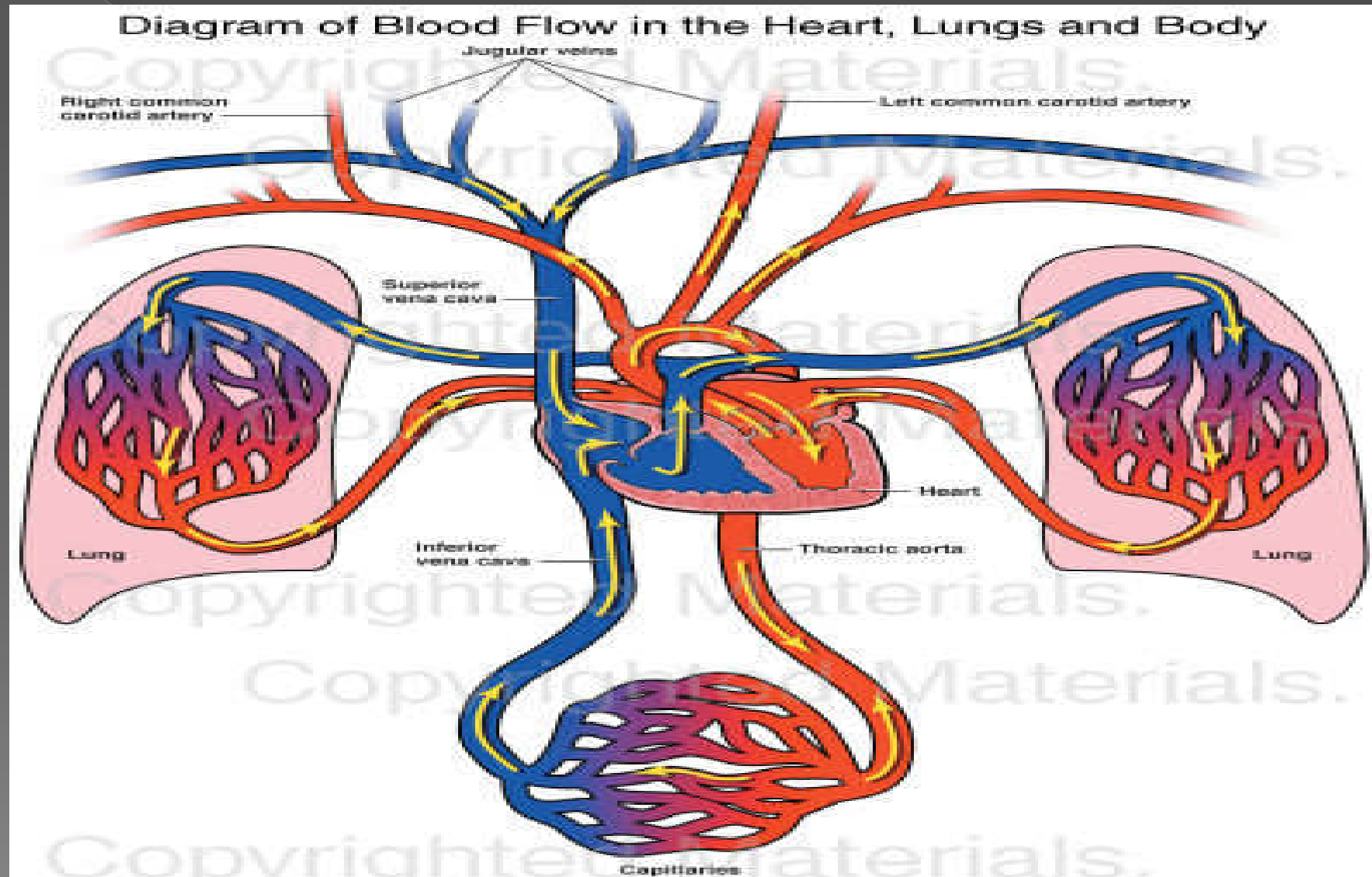
In PULMONARY circulation

- ◉ Arteries carry
- ◉ O₂-poor blood to the LUNGS
- ◉ &
- ◉ Veins carry
- ◉ O₂-ated blood from the _____ to the _____
- ◉ (Lungs) (Heart)

Direction of Blood Flow



With Organ Association



Capillaries Unique Characteristics

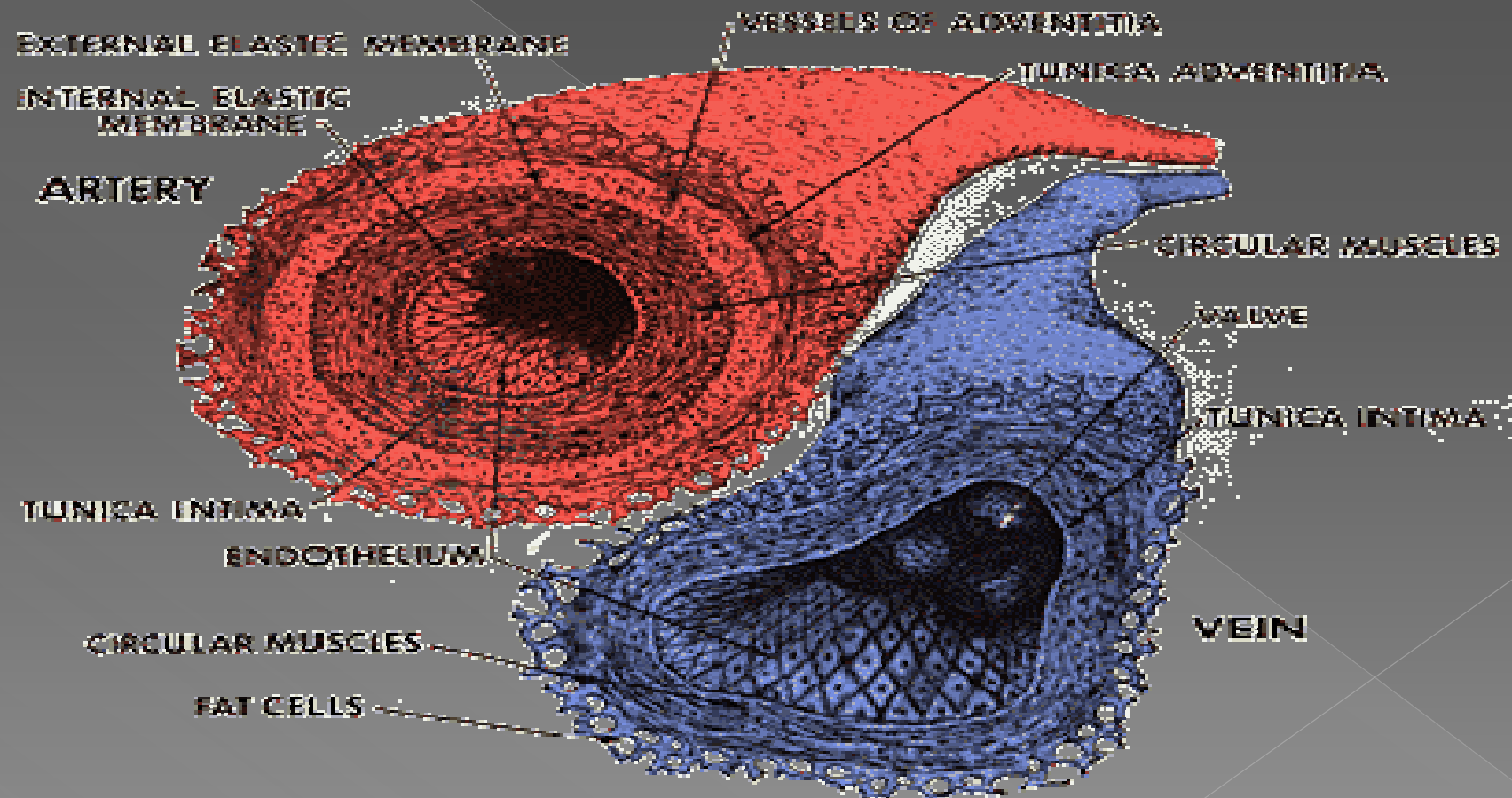
- Have intimate contact w/ tissue cells
- &
- Directly serve cellular needs
- -----Exchanges x-tween BLOOD & TISSUE occur primarily through the gossamer-thin capillary walls

All Blood Vessels Have 3 Layers

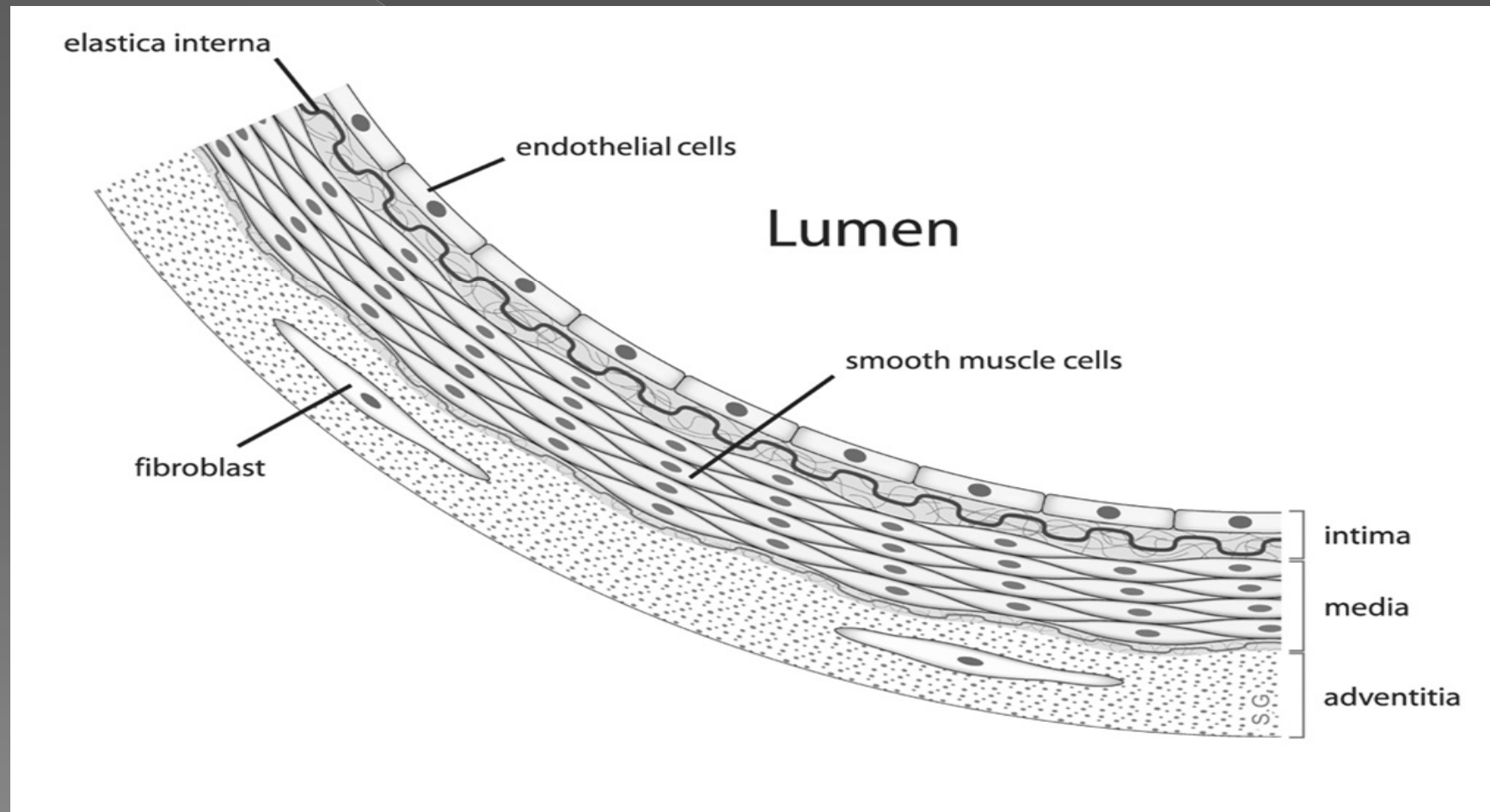
- ◉ Tunica Intima
- ◉ Tunica Media
- ◉ Tunica Externa (Adventitia)

Anatomy of Arteries/Veins

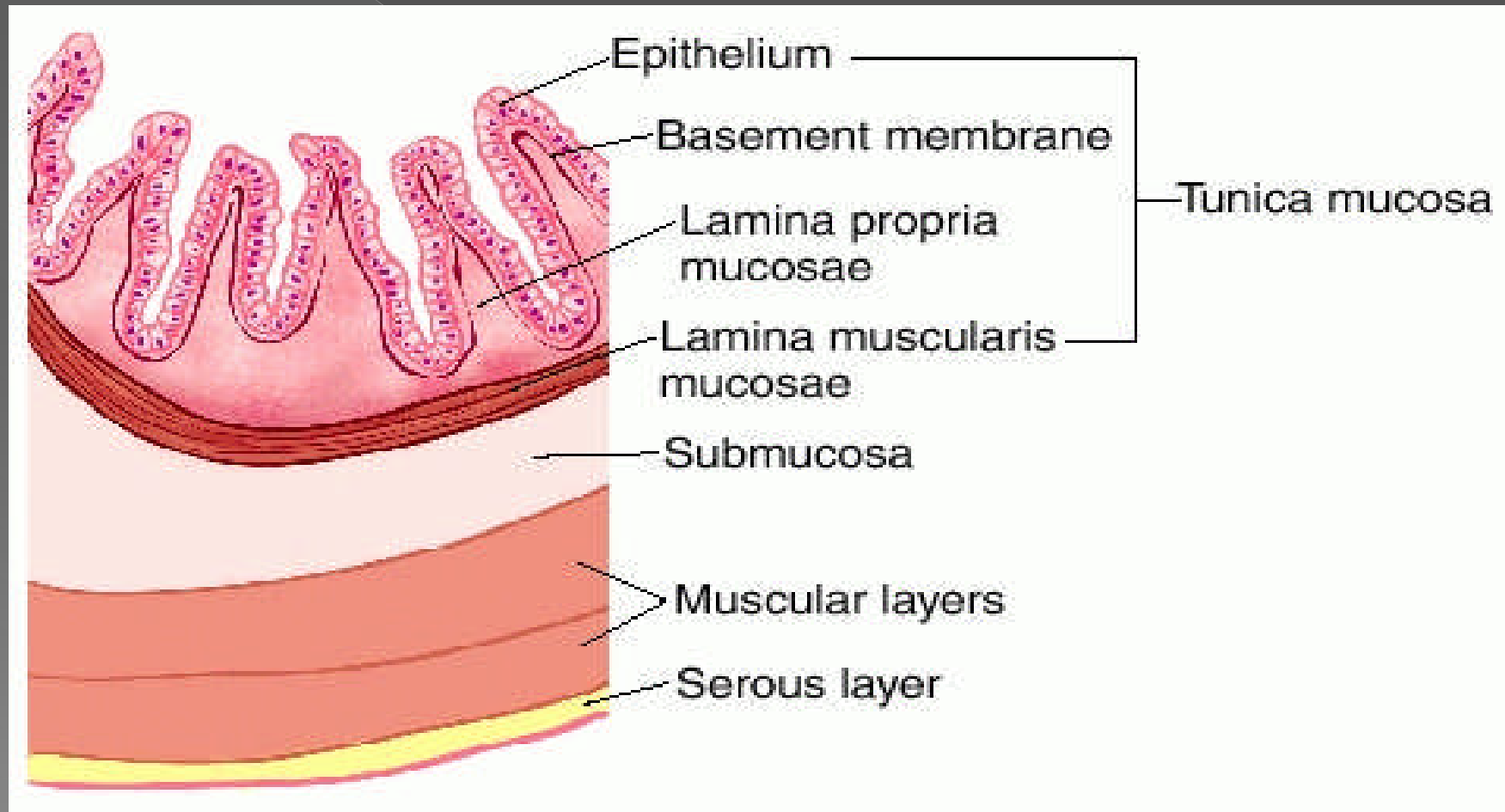
● Notice Location



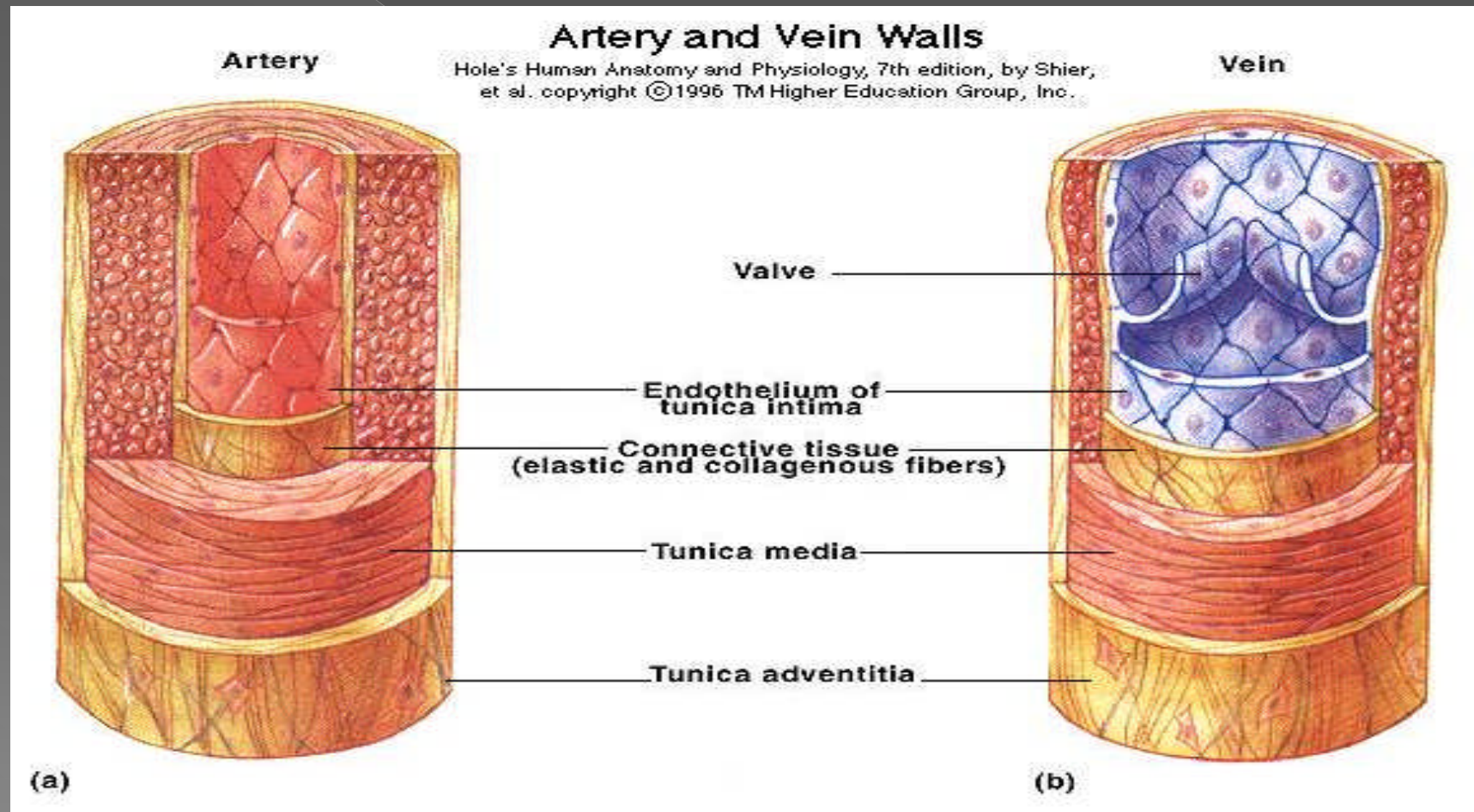
Lumens with Tissue Association



At Greater Magnification



Comparison of A's & V's



Tunica Intima (Interna)

- ◉ Intimate contact w/ blood in the _____
- ◉ (Lumen)
- ◉ Contains the endothelium...composed of?
- ◉ (simple squamous epithelial tissue that lines the lumen of ALL VESSELS)
- ◉ Is continuous with _____
- ◉ (endocardial lining)

Vessels >1mm in diameter,
have...

- ◉ A sub-endothelial layer
- ◉ CONSISTING OF?.....
- ◉ Basement membrane & loose connective tissue...it's role is to?
- ◉ Support the endothelium

Tunica Media Description

- Mostly smooth muscle cells in circular arrangement; as well as,
- Sheets of elastin
- Activity of smooth muscle is regulated by which nerve?
- (sympathetic vasomotor nerve fibers of the autonomic system & numerous chemicals

Vasoconstriction or Vasodilation Occurs Depending on Body's Needs

- ◉ Tunica Media is BULKIEST layer in arteries
W H Y ?
- ◉ Bear the chief responsibility for maintaining BP & continuation of B-flow (circulation)

Small changes in diameter of vessels greatly effect

- Blood flow & Blood Pressure

Tunica Adventitia/Externa

- ◉ Composed mainly of
- ◉ Loosely woven collagen fibers...function
- ◉ (Protect & reinforce the vessel & anchors to surrounding structures)

- ◉ --Is infiltrated by
- ◉ w/ nerve fibers
- ◉ Lymphatic vessels
- ◉ (In larger vessels...a network of elastin fibers)

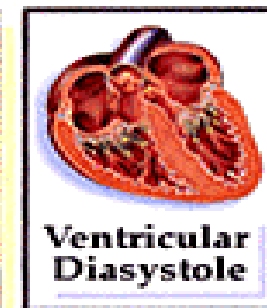
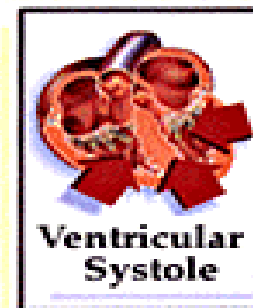
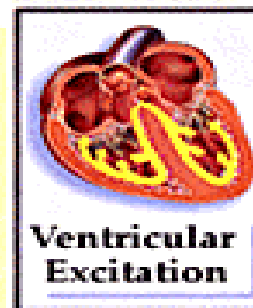
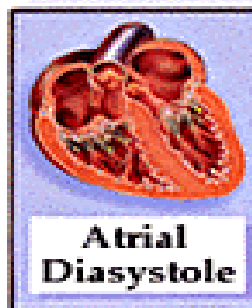
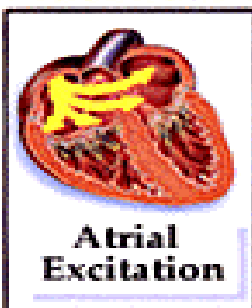
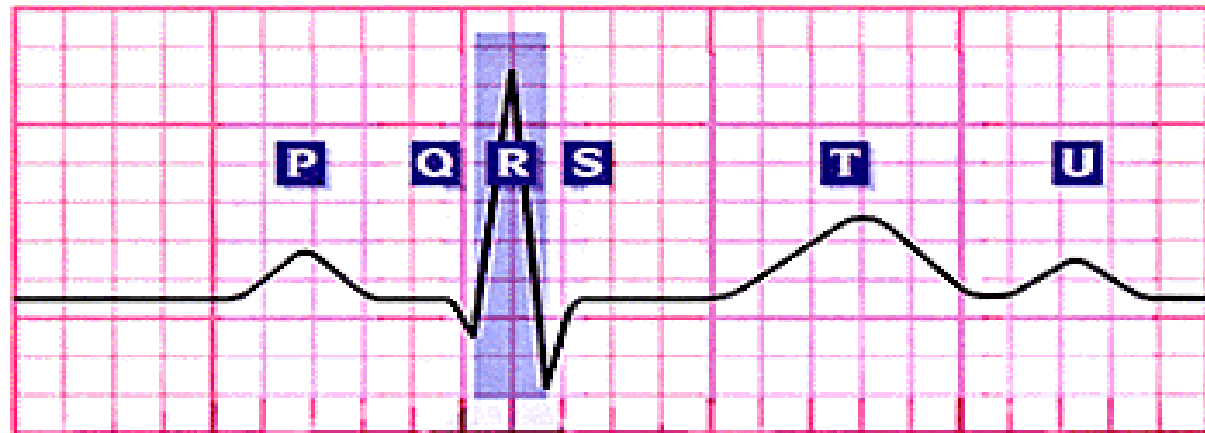
What is the vasa vasorum?

- Found in the Tunica externa, a system of tiny blood vessels
- Vessels of the vessel...function???
- Nourish the more external tissues of the blood vessel wall

ECG Game with Patients

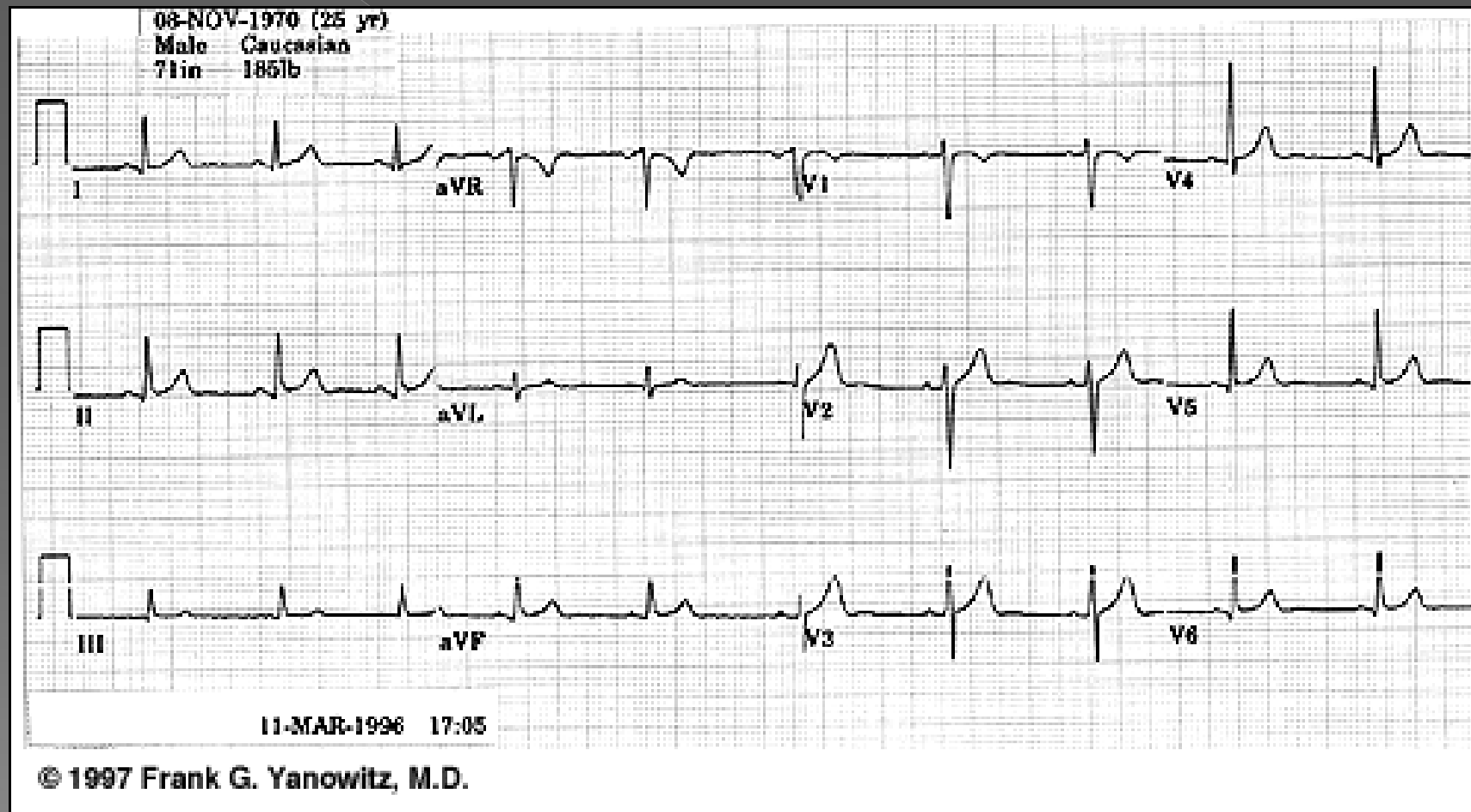
[http://www.nobelprize.org/educational/
medicine/ecg/](http://www.nobelprize.org/educational/medicine/ecg/)

How Electrical Activity Effects Mechanical Aspects



Electrical and Mechanical Events

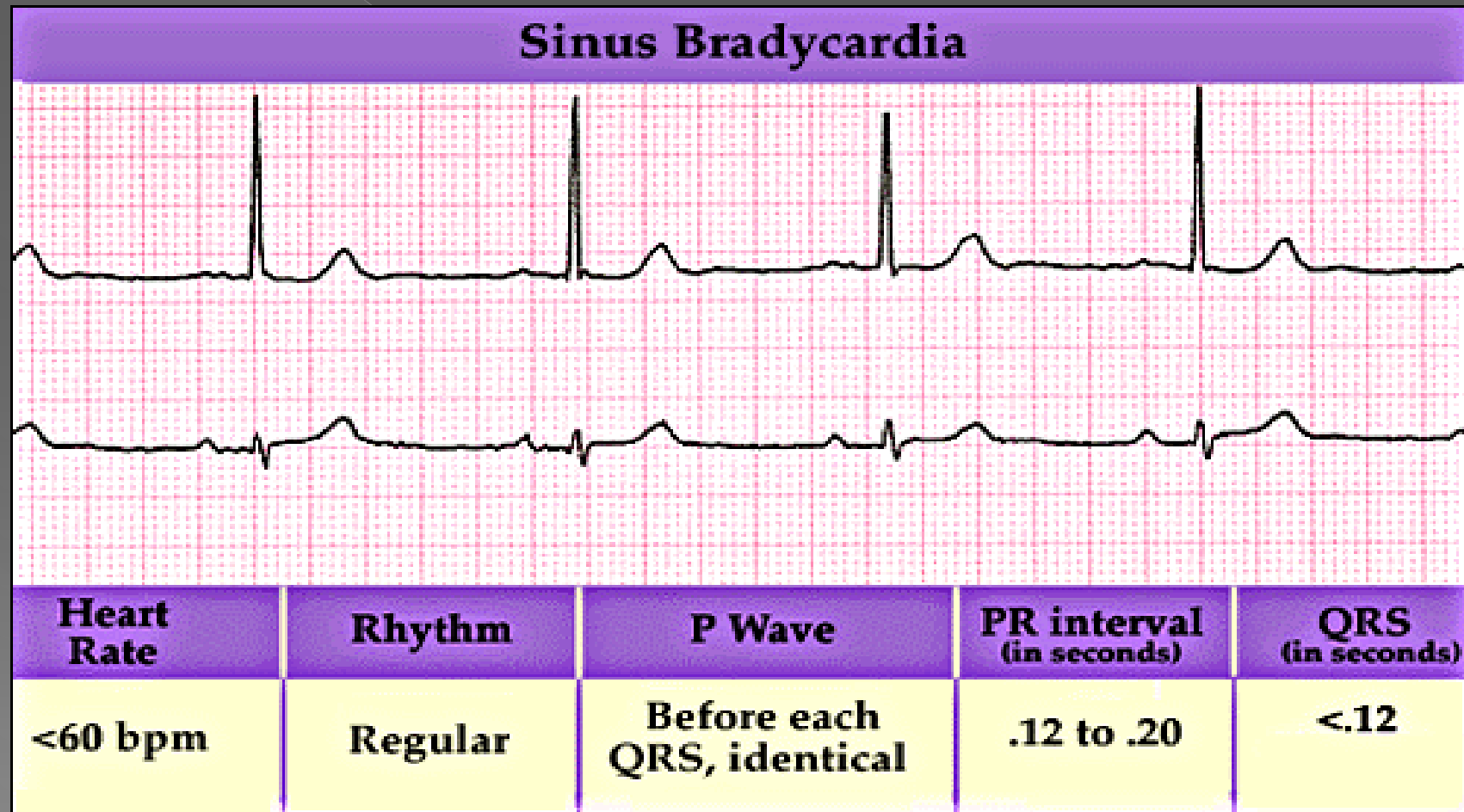
ECG Interpretation



Explain Why Utilizing Chart

- **Normal ECG-KH**

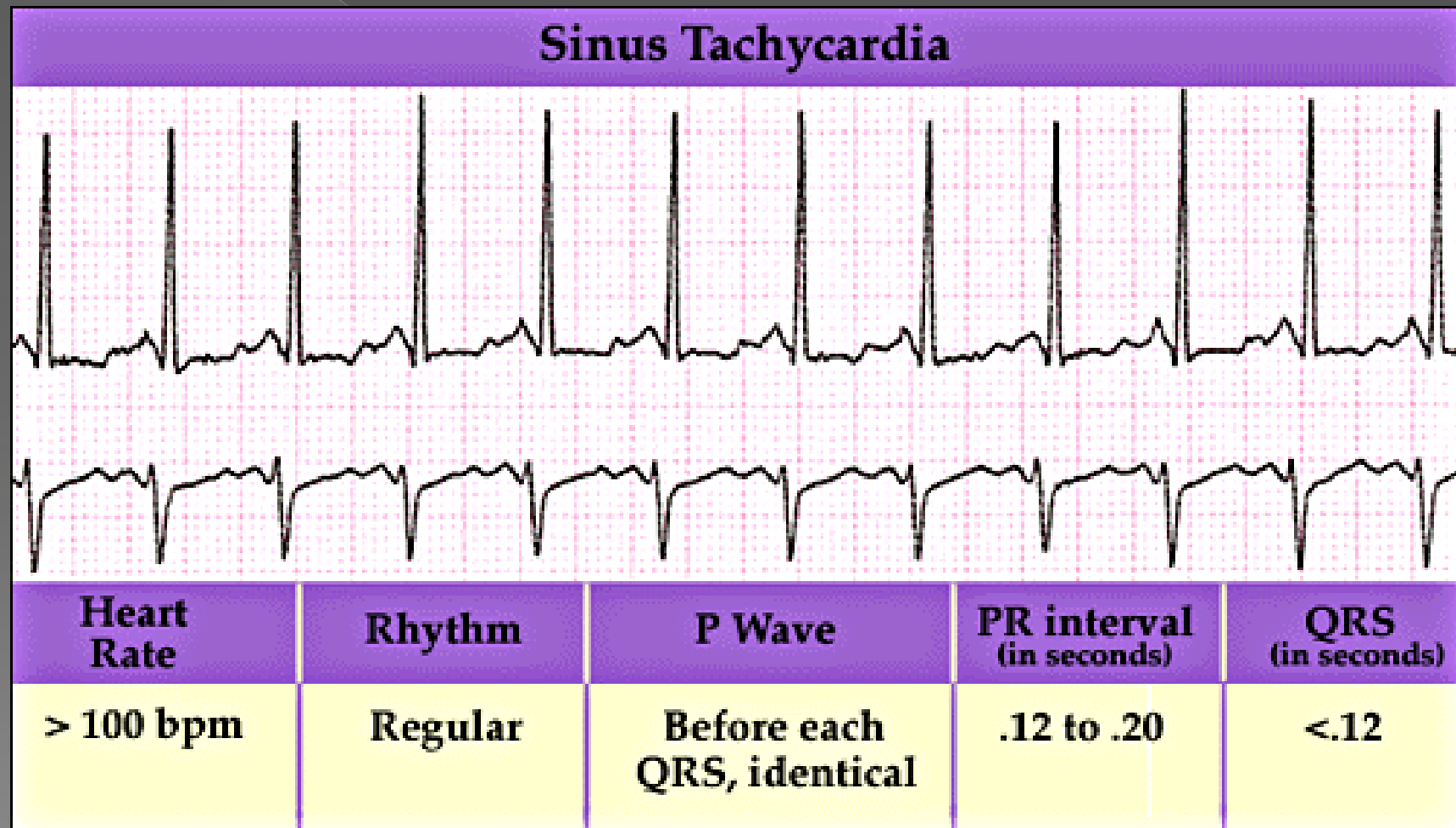
Notice Rate, Rhythm, Waves,
etc.



Explain Why from Above

- **Sinus Bradycardia - Marquette-KH**

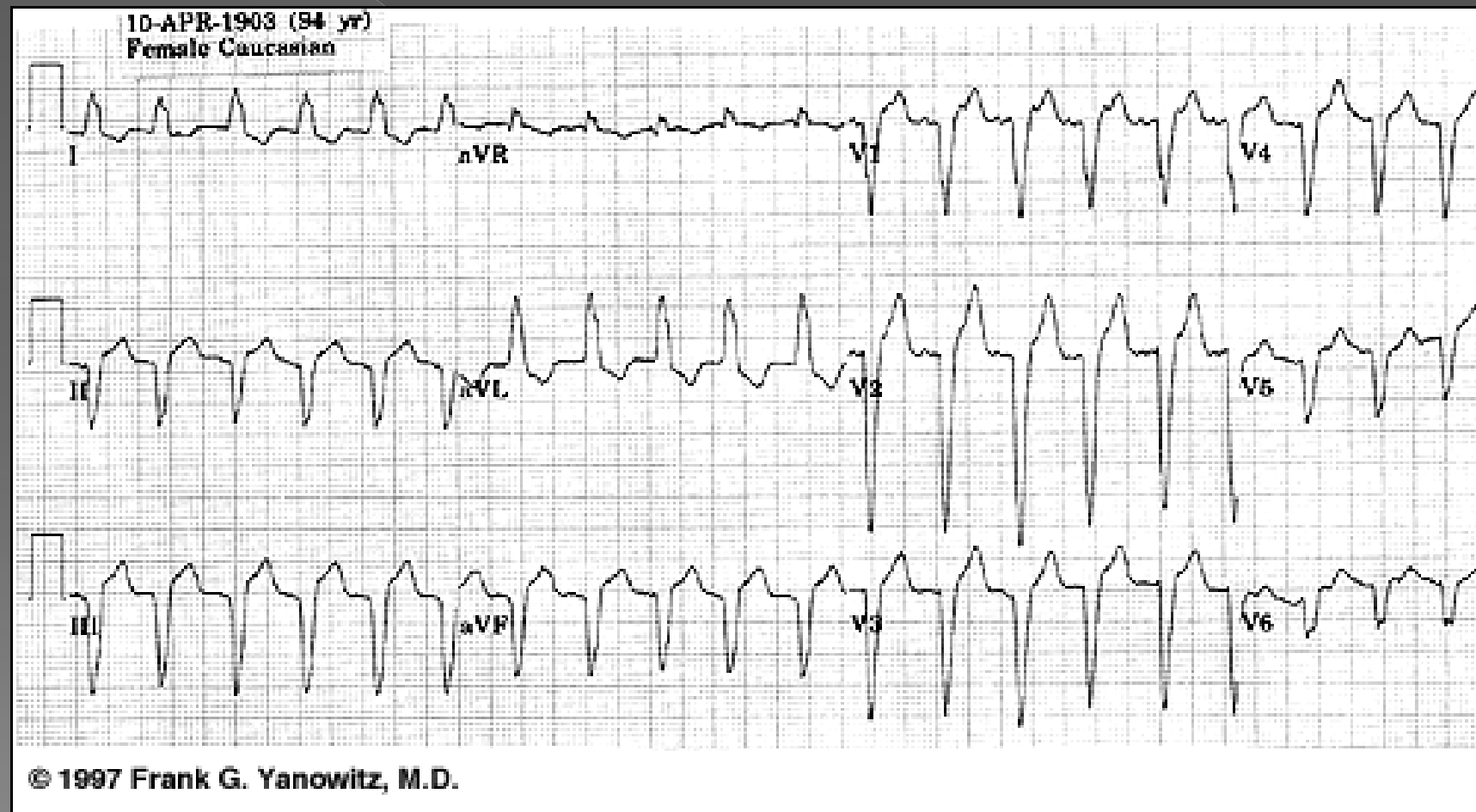
With Qualifiers



Answer

- SinusTachycardia - Marquette-KH

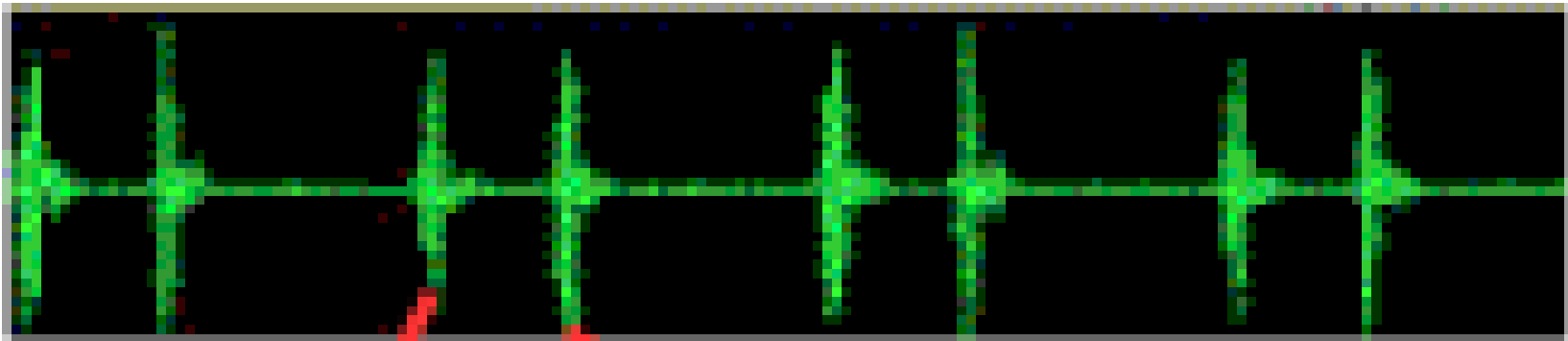
Another Example



Answer:

- Atrial Flutter with 2:1 AV Block

Austication



S1 (Lub)

S2 (Dub)