What is the CARDIOVASCULAR SYSTEM?:
pertains to:

- cardio= vascular=

Function of the CV System:

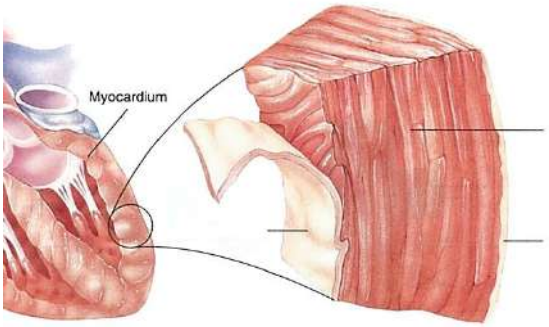
-

Structures of CVS
1. 2. 3.

THE HEART - hollow muscular organ

- Is the body's _____ to supply _____/_____.
- _____ the size of your fist

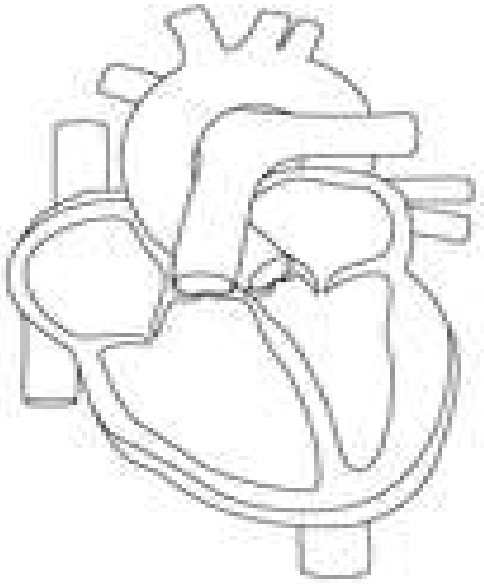
Structure:
The heart has 3 layers and is divided into 4 chambers

Pericardium- - Layers: 1. **Epicardium-** 2. **Myocardium-** a. Supplied by the coronary arteries and veins 3. **Endocardium-**	

The Cardiovascular System

Label the four Chambers:
{RA/RV/LA/LV} -

- **atria-**
- **ventricles-**
- **septum-** a separating wall or partition
  - ***interatrial septum:***
  - ***interventricular :***
- **Cardiac apex:**



Valves:

- the flow of blood through each area of the heart is controlled by the opening & shutting of _____.

1. **tricuspid**
2. **pulmonary semilunar**
3. **bicuspid/mitral**
4. **aortic semilunar**

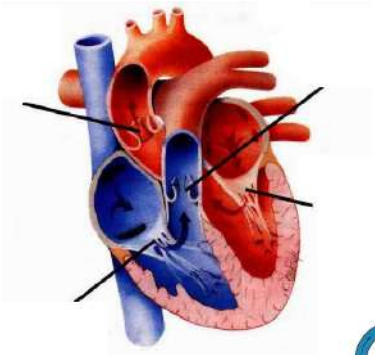


Table 5.1

BLOOD FLOW THROUGH THE HEART

The **right atrium (RA)** receives oxygen-poor blood from all tissues, except the lungs, through the **superior** and **inferior venae cavae.** Blood flows out of the RA through the **tricuspid valve** into the right ventricle.

The **right ventricle (RV)** pumps the oxygen-poor blood through the **pulmonary semilunar valve** and into the **pulmonary artery,** which carries it to the lungs.

The **left atrium (LA)** receives oxygen-rich (oxygenated) blood from the lungs through the **four pulmonary veins.** The blood flows out of the LA, through the **mitral valve,** and into the left ventricle.

The **left ventricle (LV)** receives oxygen-rich blood from the left atrium. Blood flows out of the LV through the **aortic semilunar valve** and into the **aorta,** which carries it to all parts of the body, except the lungs.

Oxygen-poor blood is returned by the venae cavae to the right atrium and the cycle continues.

Systemic vs. Pulmonary Circulation

- **systemic-**
- **pulmonary-**

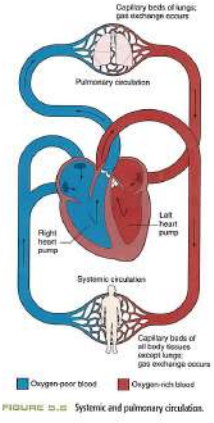
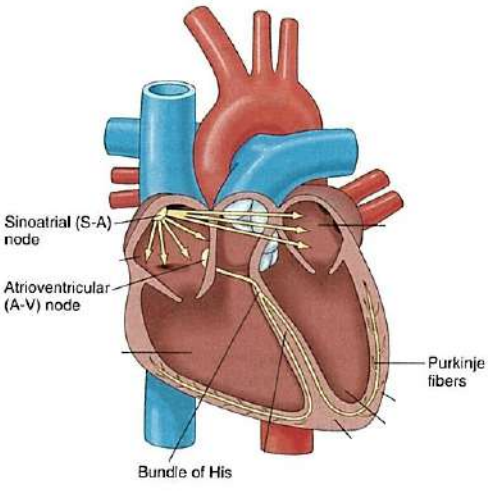


FIGURE 5.2 Systemic and pulmonary circulation.



The Heartbeat

The heartbeat is controlled by a series of _____ known as the _____ that stimulates the myocardium muscle and tell it to contract.

***NODE=** <u>*an intersection/junction/crossing**</u>

(written in order of electrical activation!)

The Cardiovascular System

1.Sinoatrial Node	
2. Atrioventricular Node	
3. Bundle of His	
4. Purkinje Fibers	

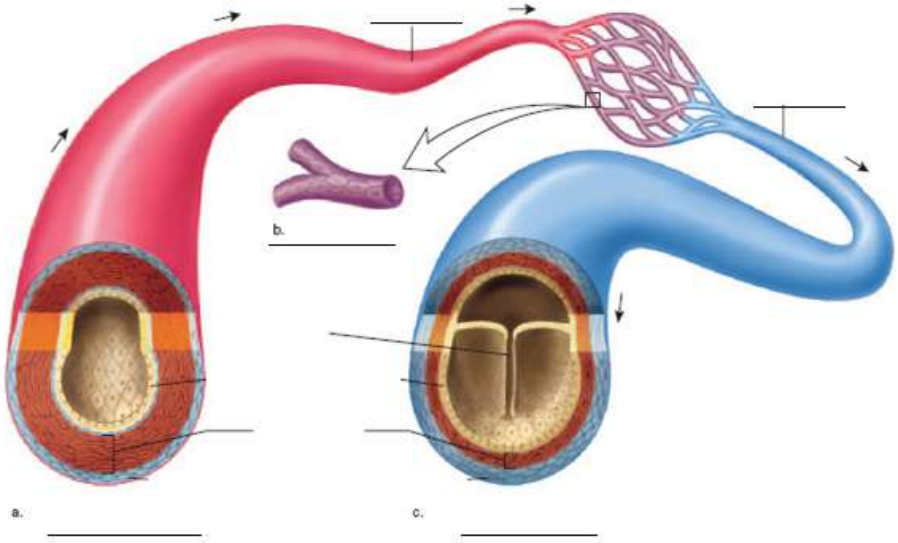
Electrical Waves

What is an **EKG (electrocardiogram)?:**

Heart Sounds

- The heart produces TWO distinct sounds known as " _____"
- **"lub"-** caused by:
- **"dub"-** caused by:

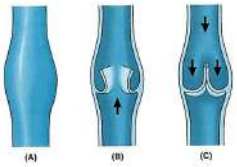
3 KINDS OF BLOOD VESSELS
& THEIR FUNCTIONS + DIFFERENCES



What is the lumen?

	Arteries	Capillaries	Veins
Where does blood go?			
Oxygenated/ deoxygenated?			*Why:

The Cardiovascular System

Pressure high/low?			
Wall Thickness?	*Why:	*Why:	
How does blood move to its destination?			*Why:
Blood Speed?	*Why:	*Why:	
Major structures	**arterioles-** **aorta-** **coronary artery-**		**venules-** **superior & inferior vena cava-**

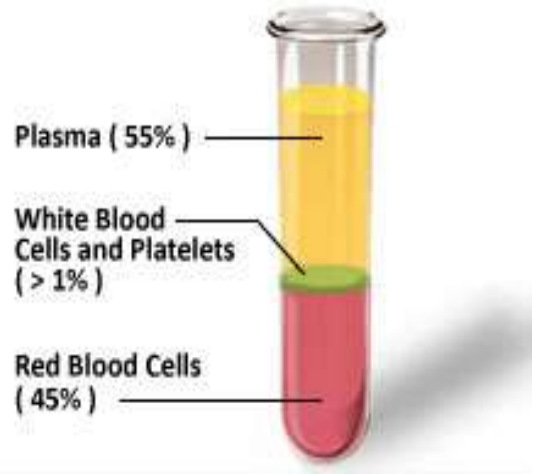
Blood Pressure

- **Pulse AKA Heart Rate-**
- **Blood pressure-**
  - **systolic-**
  - **diastolic-**

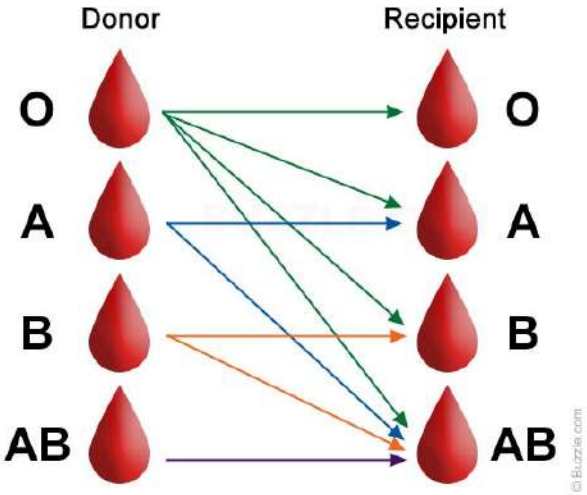
Composition of Blood

- **Serum -**

PLASMA •	
ERYTHROCYTES •	
LEUKOCYTES • • **neutrophils** • **basophils** • **eosinophils** • **lymphocytes**	



• **monocytes**	
THROMBOCYTES •	



Blood Types

The RH Factor

An **RH antigen** is present on red and white blood cells, which also makes them important to consider when crossing blood types.

Blood Gasses

Blood contains 3 major gasses:

1.
2.
3.

Who is the universal donor? _____ Who is the universal recipient? _____

Pathology

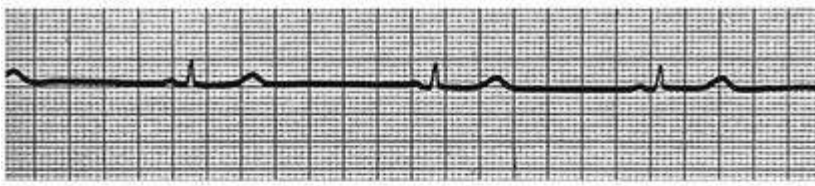
- **coronary artery disease**-
- **atherosclerosis**-
- **atheroma**
- **plaque**-
- **ischemia-**
- **angina pectoris**-
- **myocardial infarction (MI)**-
- **infarct**-.
- **congestive heart failure- (CHF)** condition in which the heart is unable to pump enough blood flow to the whole body; as a result, kidneys malfunction and allow fluid to build up in the legs, ankles & lungs.
- **carditis**-
    - Endocarditis

- Bacterial endocarditis
- Myocarditis
- Pericarditis

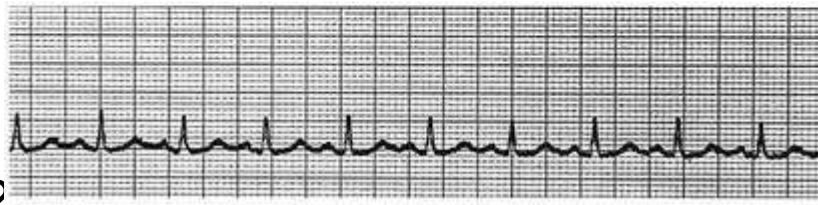
- **Valvulitis -**
- **mitral valve prolapse**- protrusion of the mitral valve does not allow it to close entirely
- **mitral stenosis**-
- **heart murmur-**

Arrhythmias
Cardiac Arrhythmia/dysrhythmia-

bradycardia	tachycardia	flutter	palpitation	paroxysmal tachycardia



Sinus _____

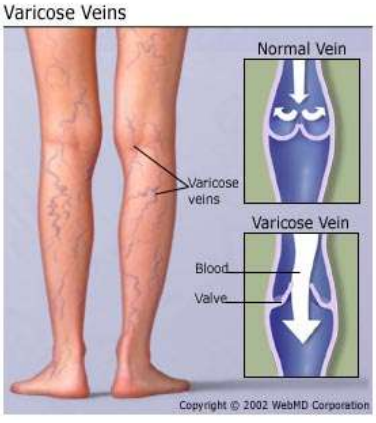


Sinus _____

*RATE: slow, fast?
*RHYTHM: skips a beat?
*QUALITY: weak, pounding?

Fibrillation
fibrillation-
atrial
fibrillat

ion- also known as _____:
ventricular fibrillation- also known as _____:

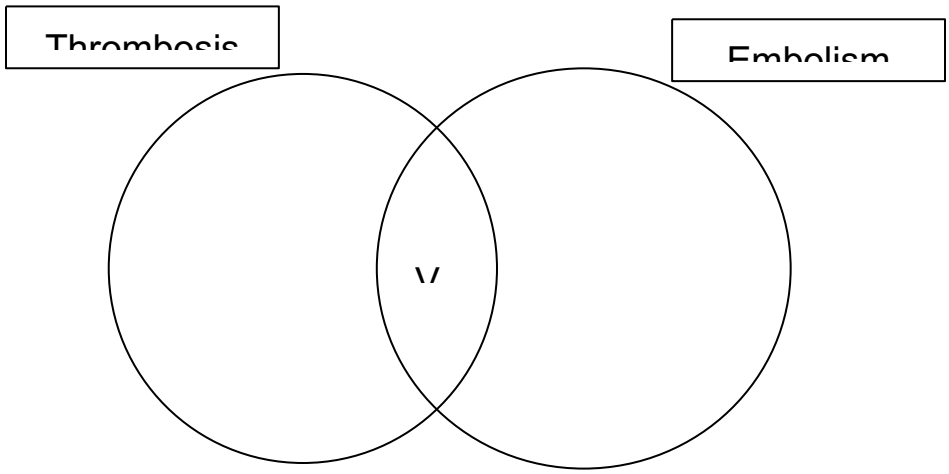


Blood Vessel Pathology

- **vasculitis/angiitis-**
- **Angionecrosis**
- **angiospasm-**
- **stenosis/angiostenosis-**
- **Hemangioma**
- **hypoperfusion-**
- **aneurysm-**
- **Arteritis/polyarteritis**

- **Arteriosclerosis -**
- **Raynaud's Phenomenon** - i
- **Phlebitis -**
- **varicose veins-**

Thromboses & Embolisms



- Thrombotic occlusion -
- Coronary thrombosis -

Blood Disorders

- **Dyscrasia**
- **septicemia-**
- **hemochromatosis-**
- **erythrocytosis-**
- **thrombocytopenia-**
- **leukopenia-**
- **leukemia-**

Cholesterol

- consists of lipids that travel in the blood in packages called _____.
    - **low-density lipoproteins (LDL)-** ____ cholesterol- contributes to plaque buildup
    - **high-density lipoproteins (HDL)-** _____ cholesterol ☺ ☺ ☺
    - **triglycerides-**
        - *Homocysteine*
        - *Hyperlipidemia*

Blood Cells

- **Erythrocytosis -**
- **Thrombocytopenia -**
- **Leukopenia -**
- **Leukemia -**

Anemias

- ***anemia*=**
- *Examples:*
    - *aplastic anemia* *hemolytic anemia* *iron-deficiency anemia*
    - *megaloblastic anemia* *pernicious anemia* *sickle-cell anemia*
    - *thalassemia*

Hypertension:

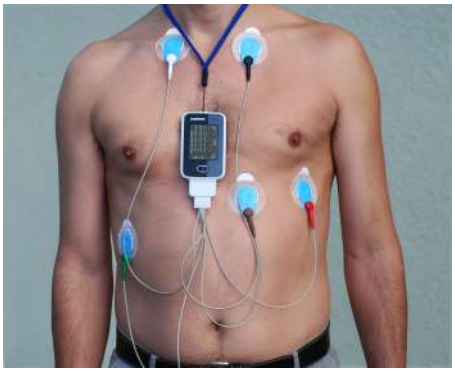
- **Primary hypertension/essential hypertension-**
- **Secondary hypertension-**
- **Malignant hypertension -**

Diagnostic Procedures of the CV System

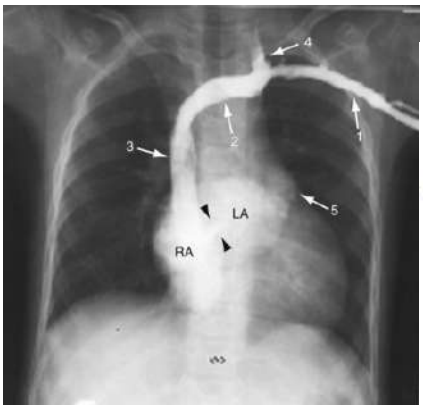
The Cardiovascular System

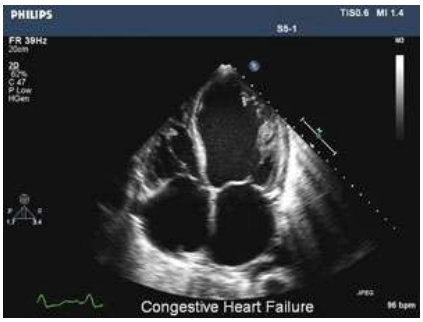
These procedures use a variety of electronic means and mediums to study the heart. Label the following and summarize the procedure!

A. _____ B._____ C. _____

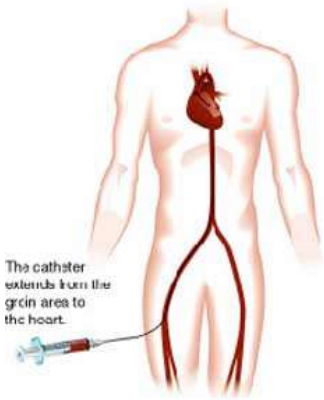


D._____ **E.** _____ **F.** _____





G. _____ **H.** _____



Blood Tests	
Angiocardiography	
Thallium Stress Test	

Transesophageal Echocardiography	

SURGERIES/PROCEDURES

Balloon angioplasty	
Stent	
atherectomy	
Endarterectomy	
Carotid Endarterectomy	
bypass surgery	
MIDCAB	
defibrillation	
pacemaker	
CPR	
aneurysmectomy	
aneurysmorrhaphy	
arteriectomy	
hemostasis	
Plasmapheresis	
transfusion	

TREATMENTS AND MEDICINES

- To reduce high blood pressure: aka **antihypertensives**
  - ACE Inhibitors
  - **Beta blockers-**
  - **Calcium channel blockers-**
  - **diuretics-**
- Additional important medicines
  - **statins-**
  - digotoxin
  - **nitroglycerin-**
  - **anticoagulant-**
  - **antiarrhythmic-**
  - **vasoconstrictor/vasodilator-**

Career Opportunities:

cardiologist
hematologist
phlebotomist
perfusionist
cardiovascular technologist
EKG Technician