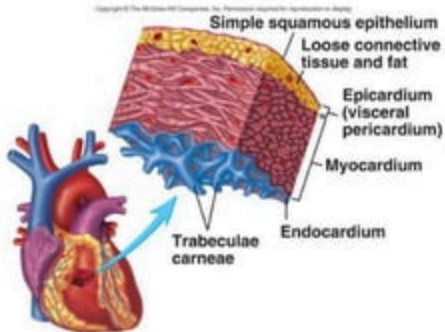


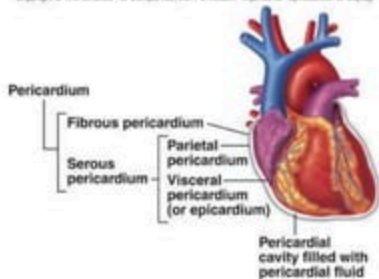
# Cardiovascular system



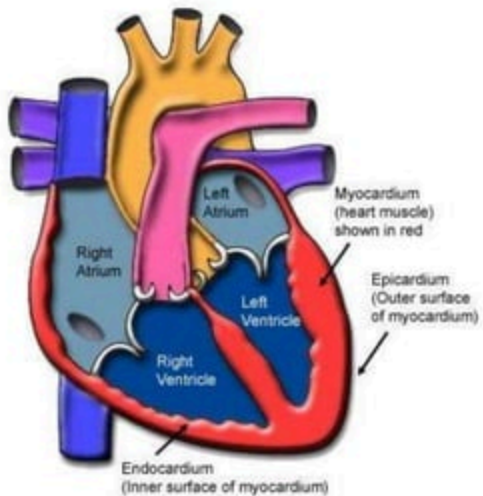
Cardium- latin  
Kardia- greek

Protected by the  
pericardium  
Inner layer:  
epicardium

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# Chambers



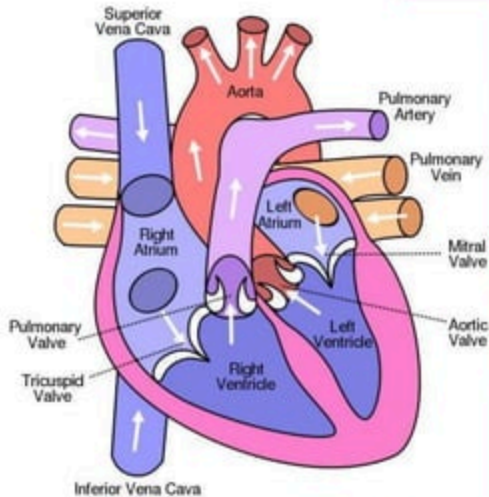
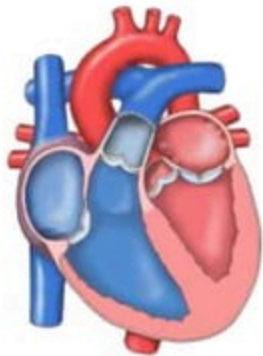
4

2: atrium

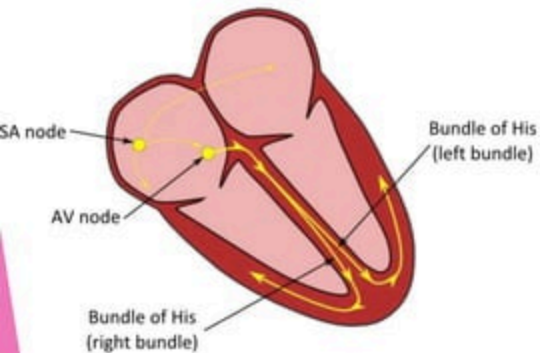
2: ventricles

# Blood's path

Superior vena cava  
Inferior vena cava



# The heart's rhythm



Contractions of the heart occur in a rhythm

Regulated by impulses that begin at the sinoatrial node (SA) (pacemaker)

Atrioventricular node (AV)

Bundle of His

Trough the Purkinge fibers(ventricular contaction)

# Autonomic nervous system

## Parasympathetic division

- Acts on the SA and AV nodes
- Slows heart rate
- Reduces impulse conduction
- Dilates coronary arteries

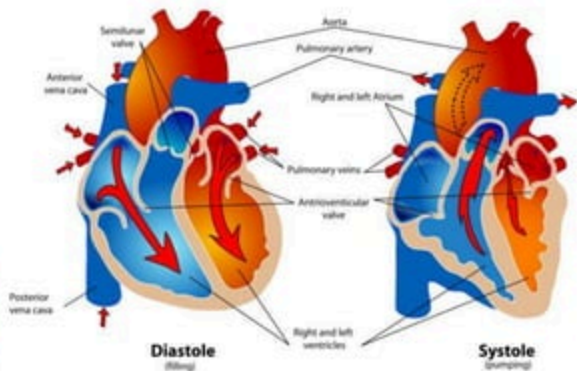


## Sympathetic division

- Acts on the SA and AV nodes
- Increases heart rate and impulse conduction
- Constricts and dilates the coronary arteries



# Cardiac cycle



- ✓ The period from the beginning of one heart beat to the beginning of the next
- ✓ Provide adequate blood flow to all body parts
- ✓ Two phases:
  - Systole:** period when the ventricles contract
  - Diastole:** when the heart relaxes

# Vascular network...

## Artery

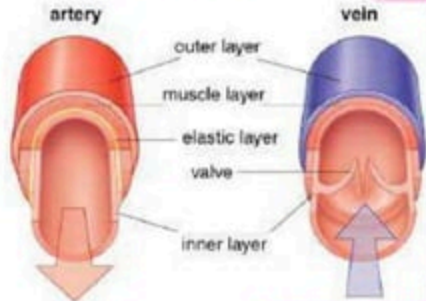
- From the Greek words *aer* (air), and *terein* (to keep)
- Carry blood away from the heart
- Carry oxygen-rich blood from heart to the rest of the body (\*pulmonary artery)

## Capillaries

- From the Latin word *Capillary*(hairlike)
- Occurs the Exchange of fluid, nutrients and metabolic wastes between blood and cells
- Are connected to arteries (through arterioles) and to veins(venules)

## Veins

- Carry blood toward the heart
- Carry oxygen-depleted blood (\*pulmonary vein)

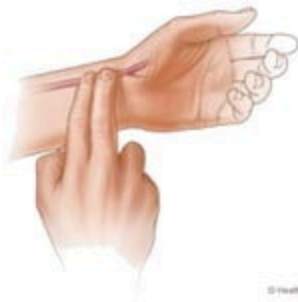




# Vital signs

The physiologic condition of a patient  
Pulse and blood pressure are directly related to the  
cardiovascular system

Pulse: expansion and contraction of an  
artery in a regular, rhythmic pattern





## Blood pressure

- ♥ Influenced by the volumen of blood, the lumen of the arteries and arterioles, and the force of the cardiac contraction
  - ♥ 120/80 mmHg
- ♥ Systolic blood pressure: 120
- ♥ Diastolic blood pressure: 80

Checking blood pressure



# Tools of the trade

Sphygmomanometer  
Stethoscope



Stethoscope Heart by *illuminati*



Zazzle

## Physical examination

- ▶ Inspection: cyanosis, pallor, diaphoresis
- ▶ Palpation: edema
- ▶ Auscultation: murmur, blowing, fluttering and bruit



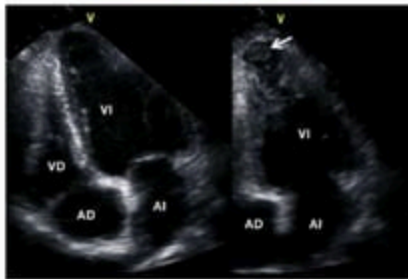
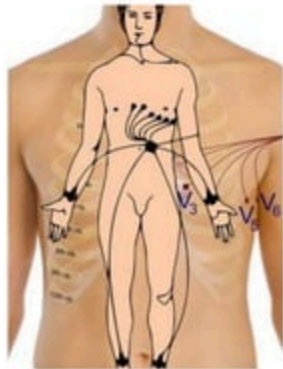
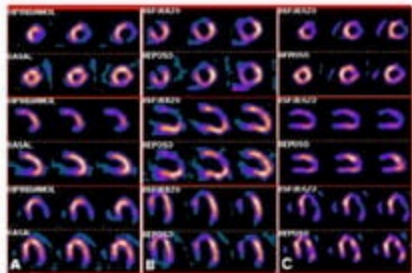
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# Diagnostic tests

- ▶ Blood tests: PTT (partial thromboplastin time), CK (creatine kinase), cardiac troponin.
- ▶ Radiologic tests: cardiac catheterization, angiocardiography, angiography, radionuclide scan, thellium stress test
  - ▶ Electrophysiologic studies
  - ▶ Pericardiocentesis
  - ▶ Transesophageal echocardiography

# Noninvasive tests

- ▶ Electrocardiogram
- ▶ Echocardiography



## Disorders

- ▶ Cardiac arrhythmias
- ▶ Congenital heart defects
- ▶ Degenerative disorders
- ▶ Inflammatory heart disease
- ▶ Vascular disorders
- ▶ Valvular heart disease



# Cardiac arrhythmias

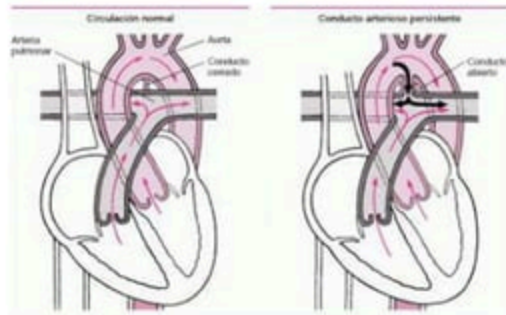
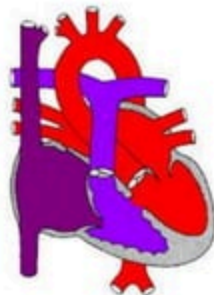
- ▶ Atrial flutter
- ▶ Bradycardia
- ▶ Fibrillation
- ▶ Heart block
- ▶ Paroxysmal atrial tachycardia
- ▶ Premature atrial contraction
- ▶ Premature ventricular contraction
- ▶ Tachycardia
- ▶ Ventricular tachycardia





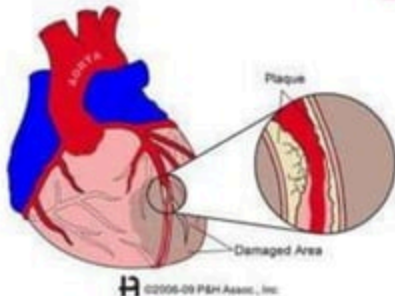
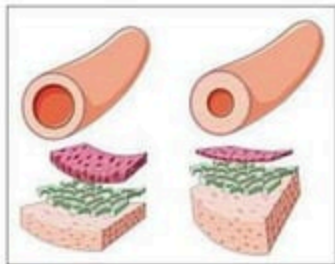
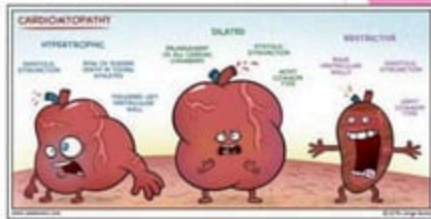
# Congenital heart defects

- ▶ Atrial septal defect
- ▶ Coarctacion of the aorta
- ▶ Patent ductus arteriosus
- ▶ Tetralogy of fallot
- ▶ Ventricular septal defect



# Degenerative heart conditions

- ▶ Coronary artery disease
- ▶ Dilated cardiomyopathy
- ▶ Heart failure
- ▶ Hypertension
- ▶ Hypertrophic cardiomyopathy
- ▶ Heart attack
- ▶ Restrictive cardiomyopathy

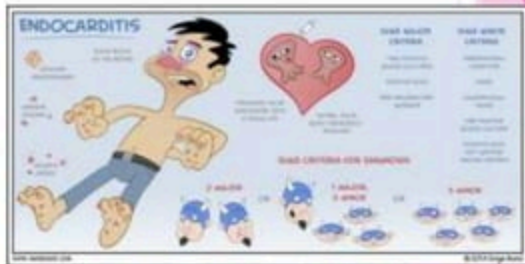
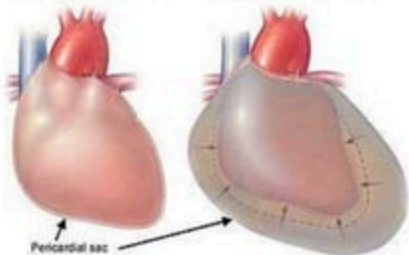


# Inflammatory heart disease

- ▶ Endocarditis
- ▶ Myocarditis
- ▶ Pericarditis
- ▶ Rheumatic fever

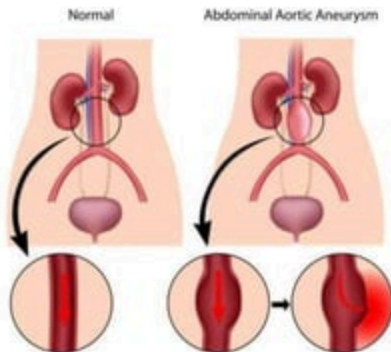
Normal pericardium

Pericardial effusion



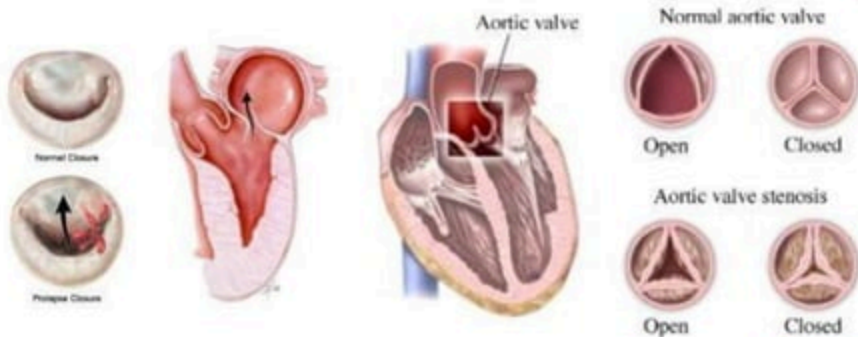
# Vascular disorders

- ▶ Arterial occlusive disease
- ▶ Raynaud's disease
- ▶ Thrombophlebitis
- ▶ Aneurysm (abdominal aorta, thoracic aorta, saccular, fusiform, dissecting and false)



# Valvular disorders

- ▶ Stenosis (aortic, mitral, tricuspid)
- ▶ Insufficiency (aorta, mitral, tricuspid and pulmonary valve)



# Treatments

## Drug therapy:

- ▶ Adrenergics
- ▶ ACEI's
- ▶ Antianginal
- ▶ Antiarrhythmics
- ▶ Antihypertensives
- ▶ Beta-adrenergic blockers
- ▶ Calcium channel blockers
- ▶ Cardiac glycosides
- ▶ Diuretics
- ▶ Thombolytic therapy

### Class I

Ia Quinidine, procainamide, disopyramide

Ib Lidocaine, mexiletine, tocainide

Ic Flecainide, propafenone

Class II  $\beta$ -adrenergic blocking drugs

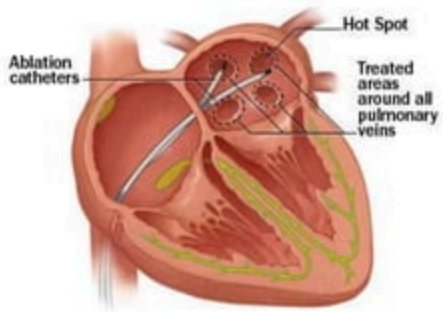
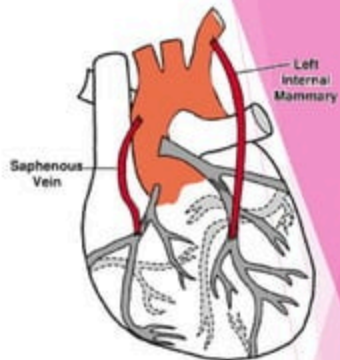
Class III Amiodarone, sotalol, bretylium

Class IV Verapamil, diltiazem

(Other drugs Adenosine, digoxin)

# Surgery

- ▶ Ablation
- ▶ Cardiac conduction surgery
- ▶ Coronary artery bypass graft
- ▶ Heart transplantation



## Other treatments

- ▶ Advanced cardiac life support
- ▶ Cardiopulmonary resuscitation
- ▶ Defibrillation
- ▶ Implantable cardioverter-defibrillator
- ▶ Intra-aortic balloon counterpulsation
- ▶ Laser-enhanced angioplasty
- ▶ Pacemarkers
- ▶ Percutaneous transluminal coronary angioplasty
- ▶ Stent
- ▶ Synchronized cardioversion
- ▶ Valve replacement surgery
- ▶ Ventricular assist device





# Thank You!



- from the  
bottom of me!

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