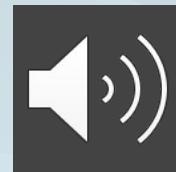


POWERPOINTS TO ACCOMPANY

**Physical Change and Aging: A Guide for the Helping Professions, Seventh
Edition**

Sue V. Saxon, PhD, Mary Jean Etten, EdD, APRN, CMP, FT, and
Elizabeth A. Perkins, PhD, RNLD, FAAIDD, FGSA

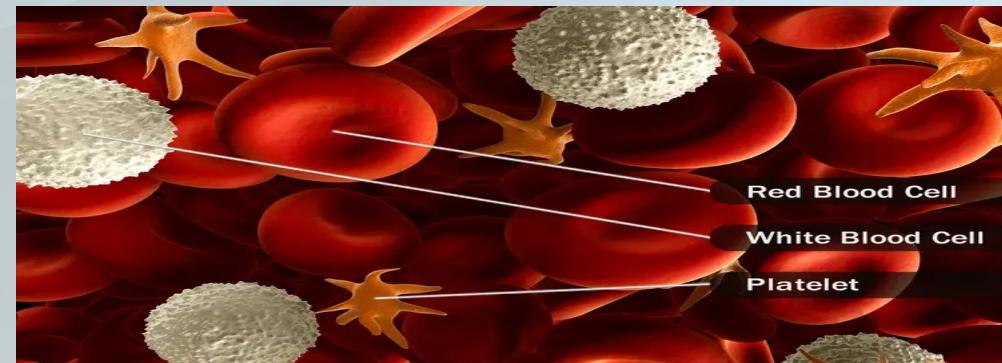
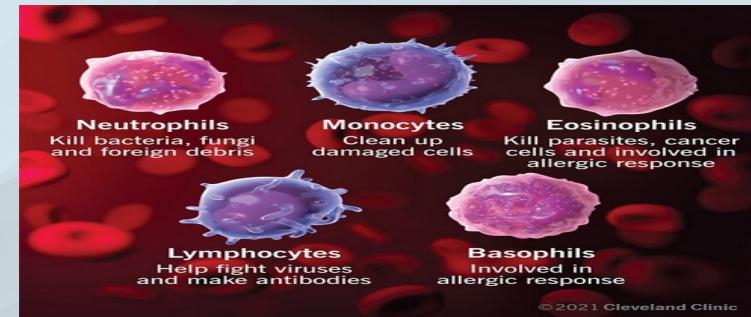
**Chapter 8: The Cardiovascular
System**



Blood

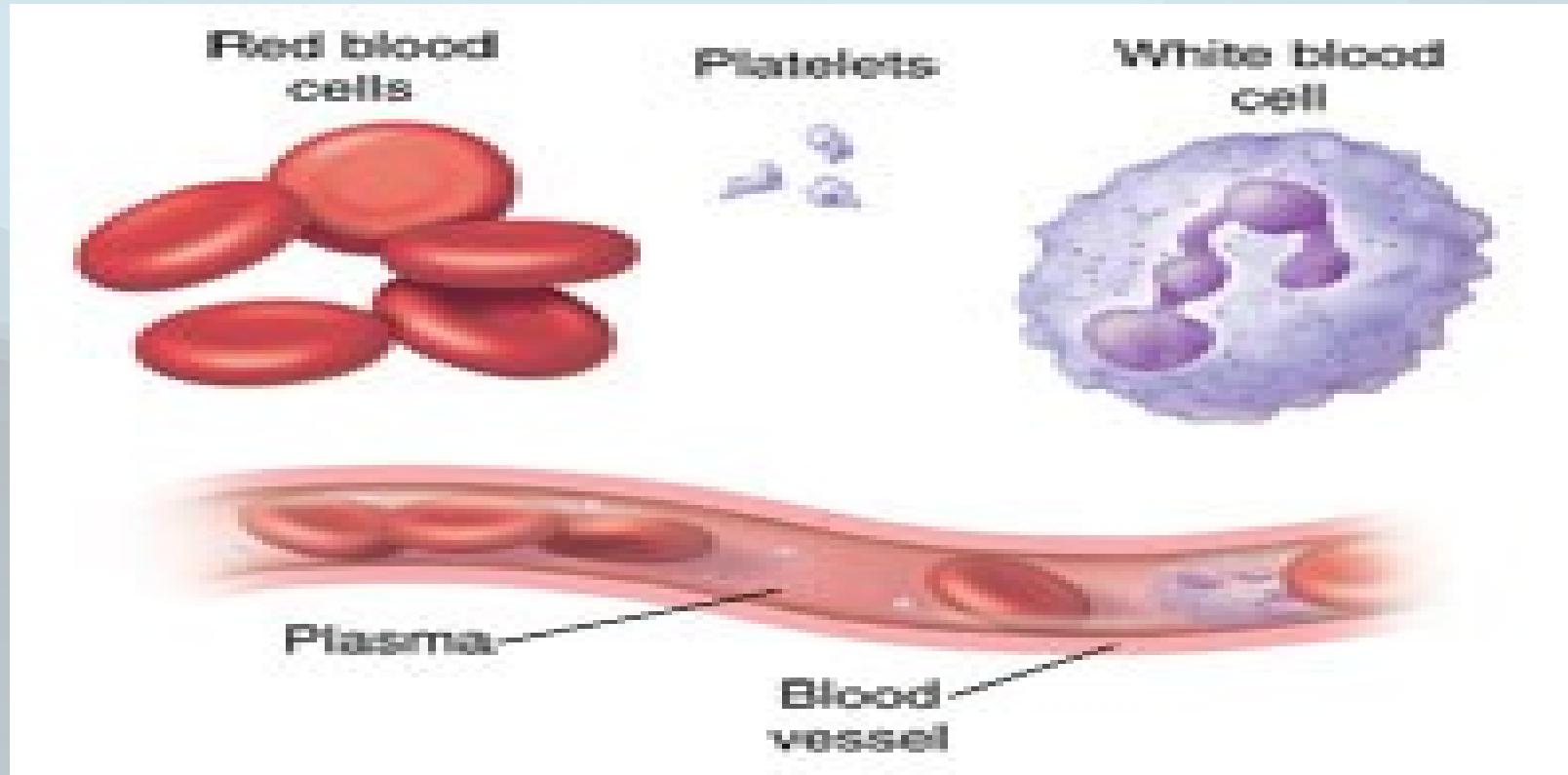
- **Components**

- **Red blood cells (erythrocytes)**
 - Carry oxygen to all cells of body
- **White blood cells (leukocytes)**
 - Protect body from attack by viruses, bacteria, etc.
- **Platelets (thrombocytes)**
 - Essential for blood clotting.





- **Plasma**
 - Fluid component of blood

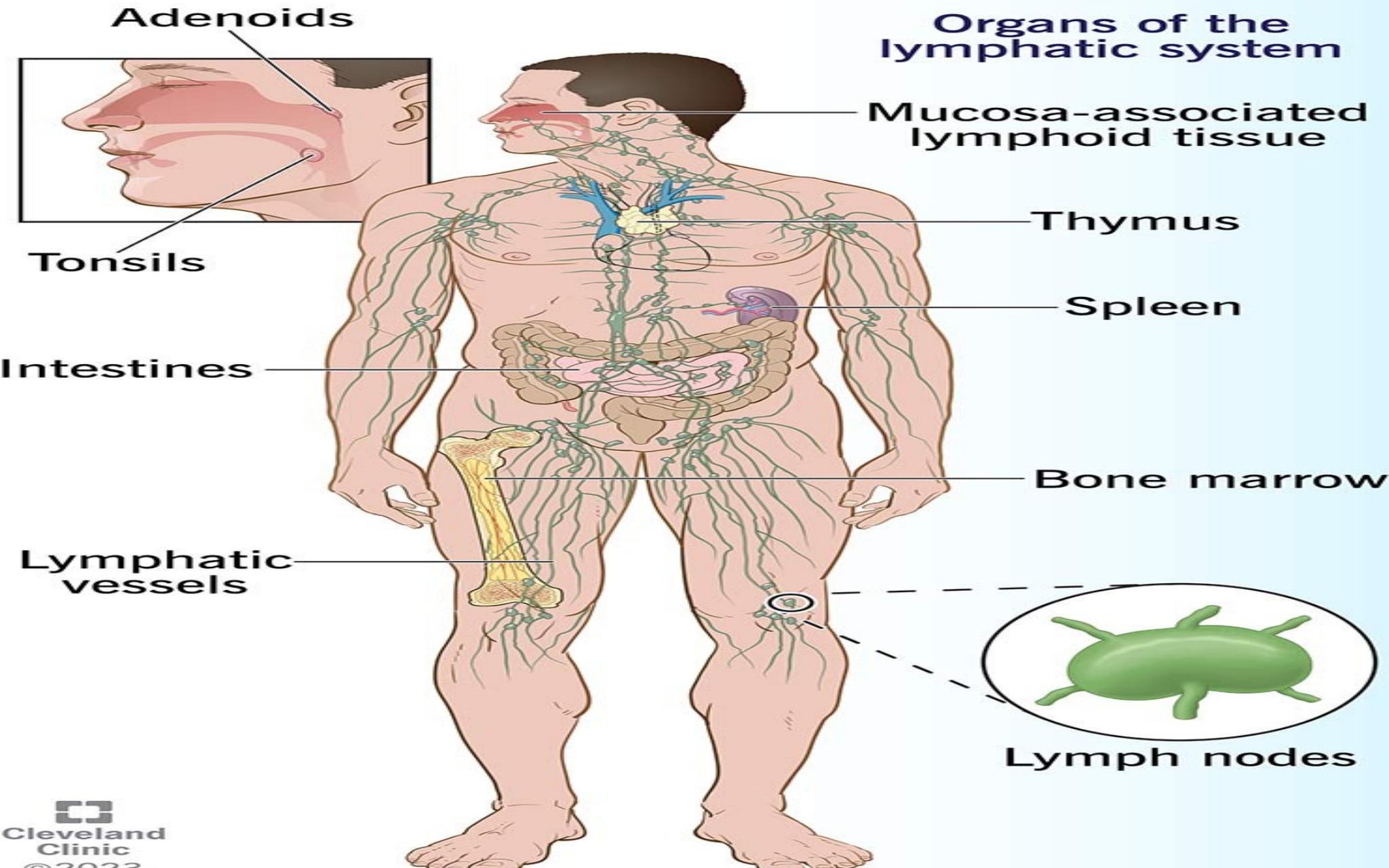


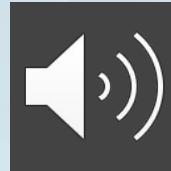


Lymphatic System

- Components
 - Lymph: a fluid originating in tissue spaces in body
 - Lymph vessels: transport lymph from tissues to bloodstream
 - Lymphoid organs: lymph nodes, spleen, thymus, tonsils, Peyer's patches (intestine)
- Function
 - Prevent spread of infection and disease
 - Filter out foreign particles and bacteria as lymph passes through lymphoid organs

Lymphatic System

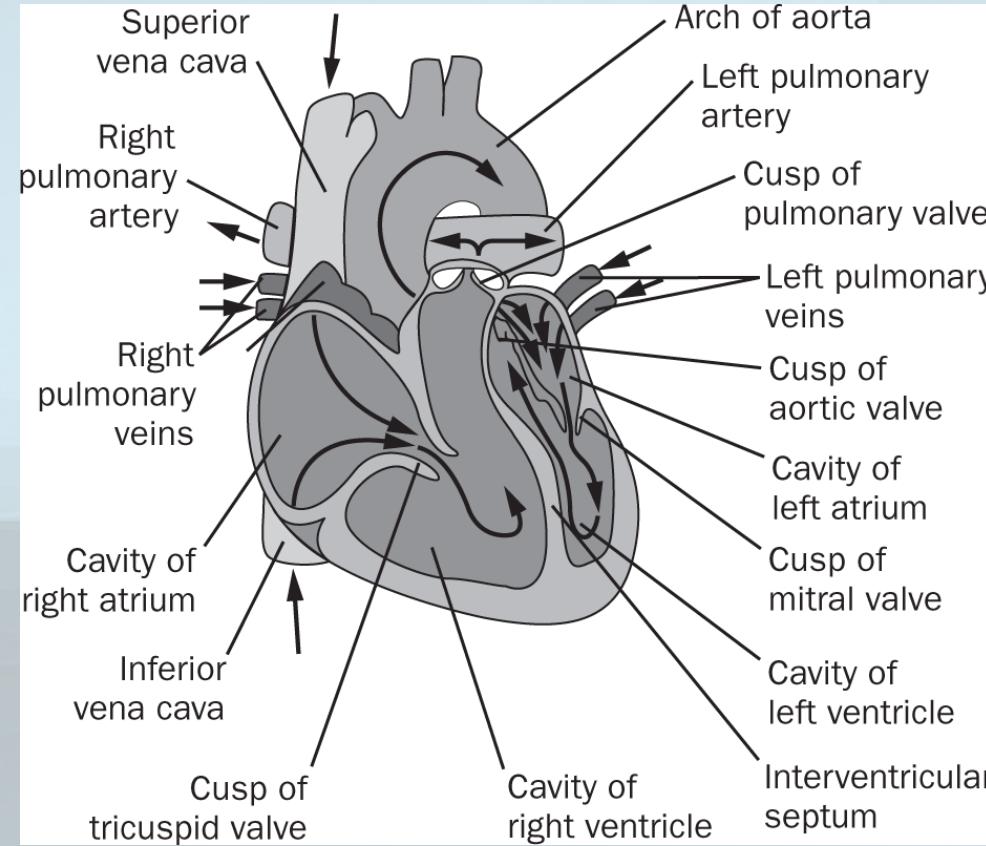




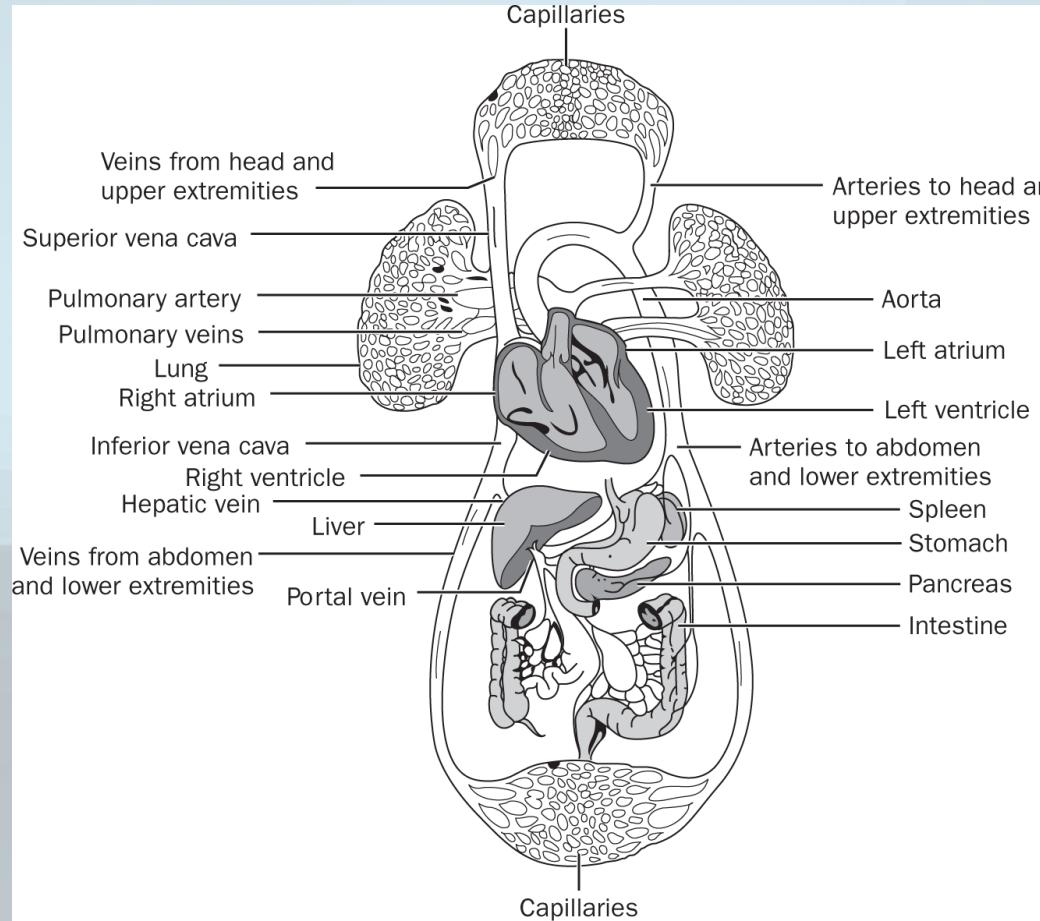
- **Components**
 - **Heart:** a pumping organ
 - **Arteries:** conduct blood from heart to body cells
 - **Arterioles:** smallest arteries
 - **Veins:** conduct blood from tissues back to heart
 - **Venules:** smallest veins
 - **Capillaries:** tiny vessels connecting arterioles and venules



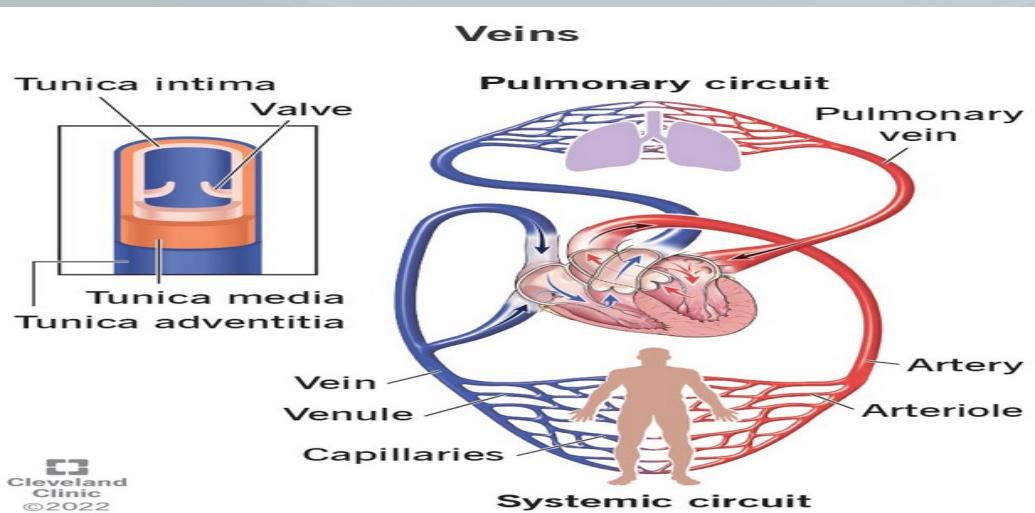
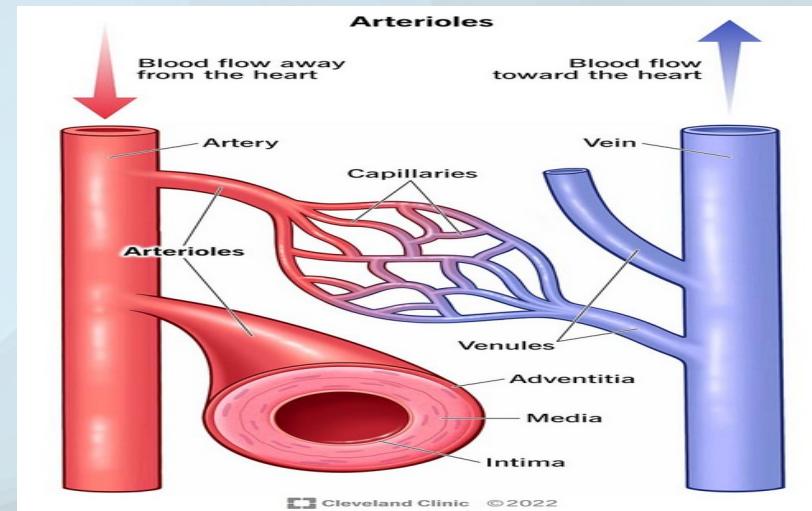
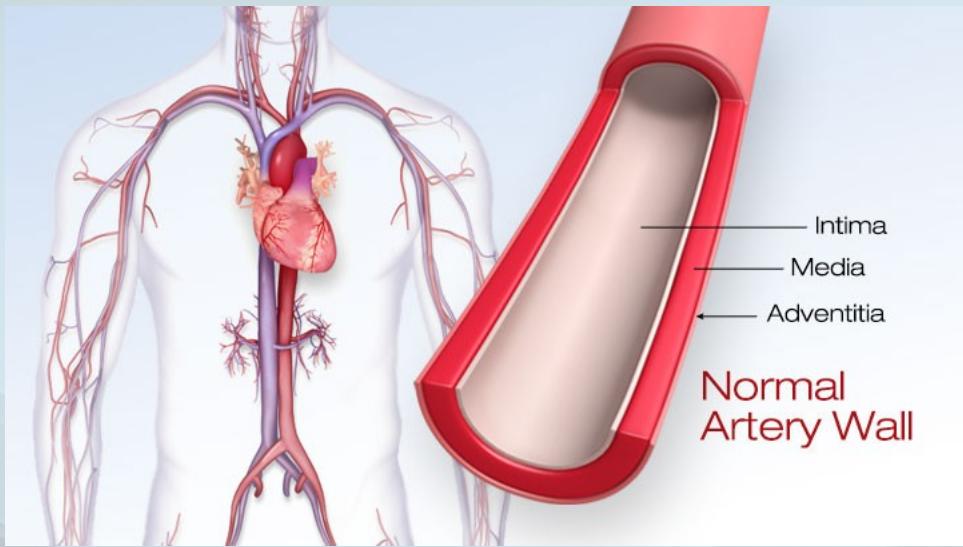
Anatomy of the Heart and Great Vessels



Pulmonary and Systemic Circulations



Arteries, Arterioles, Veins, Venules, and Capillaries





Age-Related Cardiovascular Changes: Structural

- Increase in fatty tissues in outermost heart
 - Thickening of left ventricular wall
 - Increase in collagen, decrease in elastin
 - Accumulation of lipofuscin
 - Thickening and sclerosis of heart valve flaps
 - Decrease in pacemaker cells
 - Loss of muscle cells
-
- Decreases in:
 - Contractile strength
 - Maximum heart rate
 - Stroke volume
 - Cardiac output
 - Ejection fraction
 - Oxygen uptake

Age-Related Cardiovascular Changes: Functional

- Longer recovery
- Slight arrhythmias
- Decline in cardiac output
- Increase in atrial fibrillation and incidence of heart block
- Loss of elasticity in arteries and veins
- Levels of blood components slightly diminished



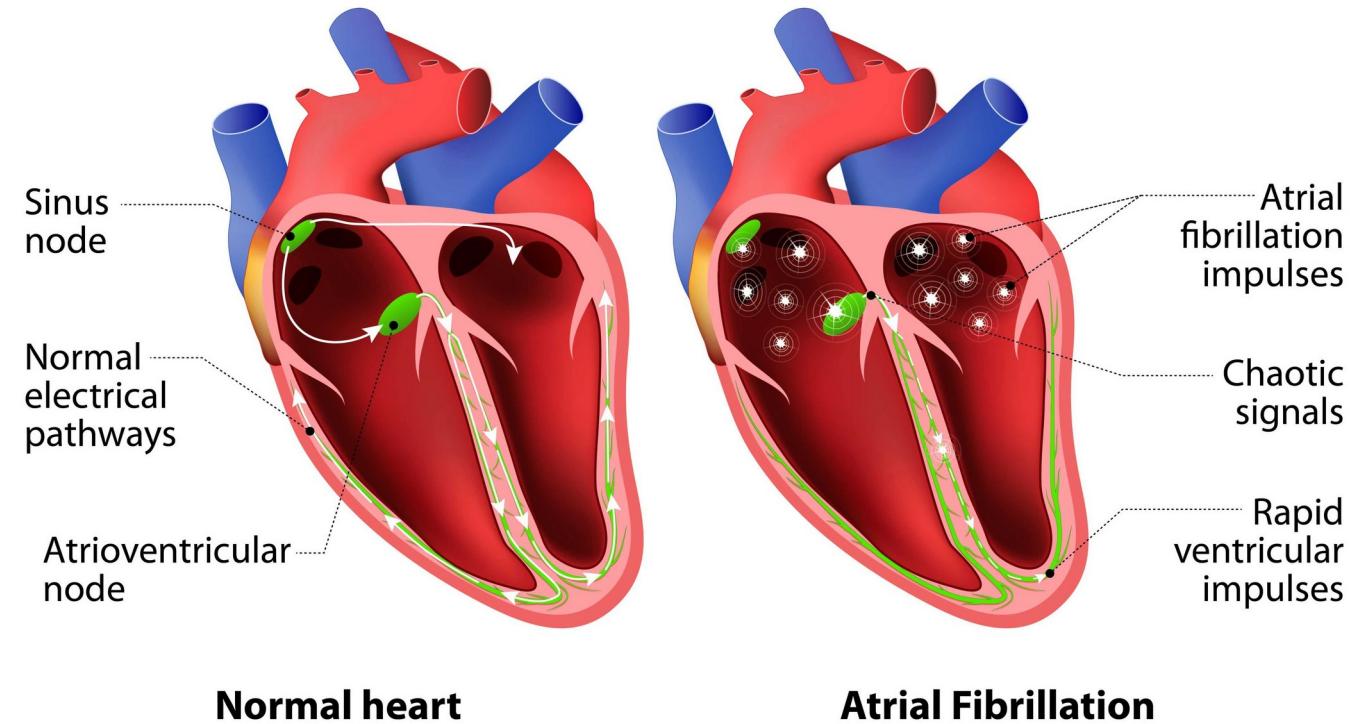


Age-Related Disorders of the Cardiovascular System

- Arteriosclerosis and atherosclerosis
- Hypertension
- Postural (orthostatic) hypotension
- Angina pectoris
- Myocardial infarction
- Congestive heart failure
- Cardiac arrhythmias (irregular heart beat) and conduction disorders
- Transient ischemic attack
- Cerebrovascular accident (stroke)



Cardiac arrhythmia



Atherosclerosis and Hypertension



Atherosclerosis

Normal artery

Atherosclerosis

Plaque

Progression

Formation

Growth and
rupture

Blood clot

Cleveland Clinic ©2024

High Blood Pressure

Hypertension

Systolic number
is when the
heart contracts

≥ 130

≥ 80

Diastolic number
is when the
heart rests

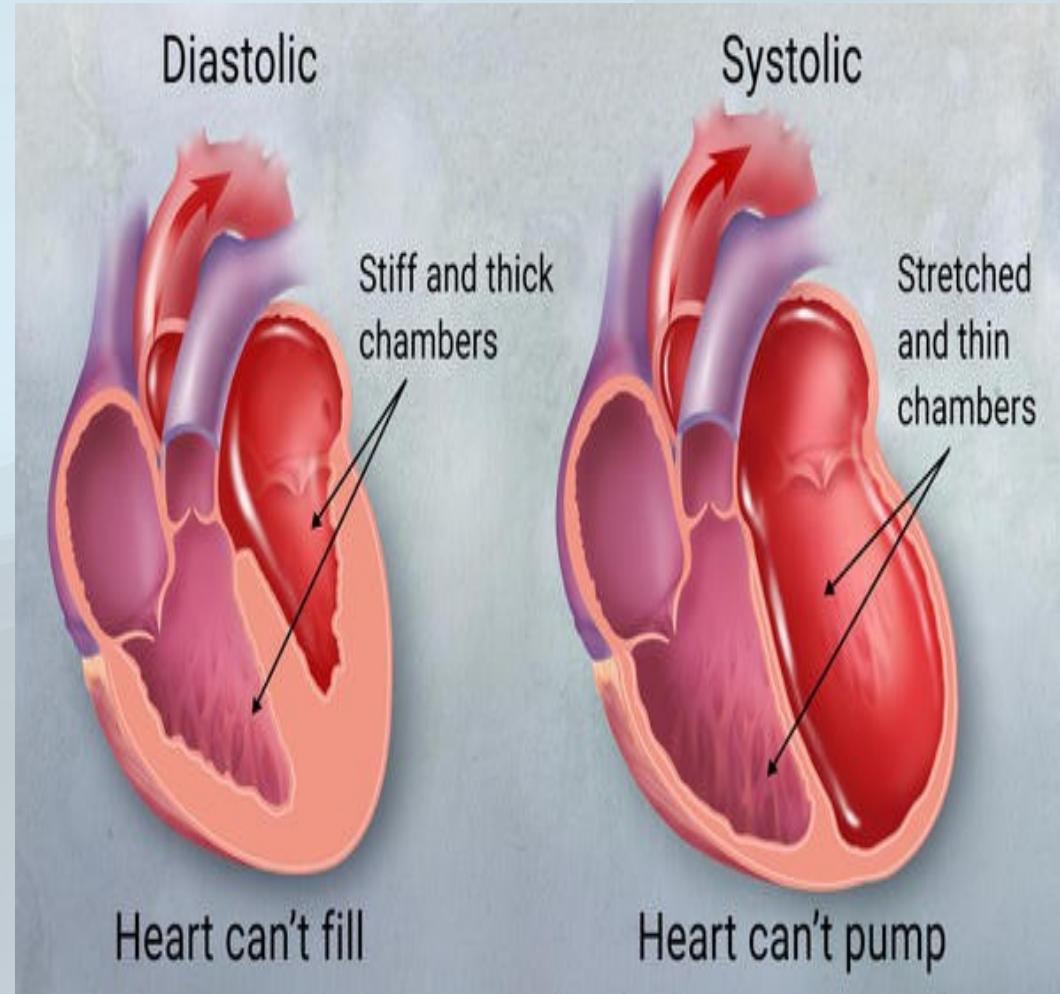
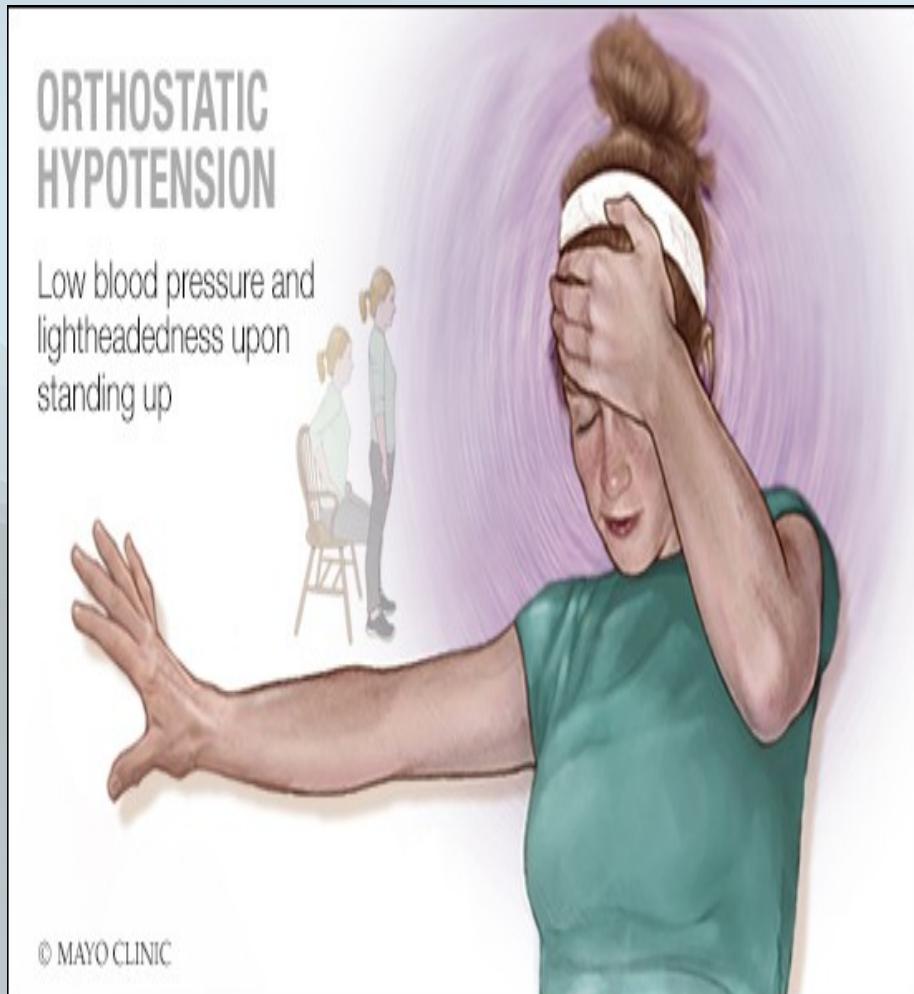
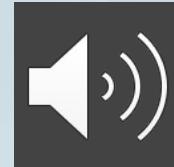
Force of blood on artery wall

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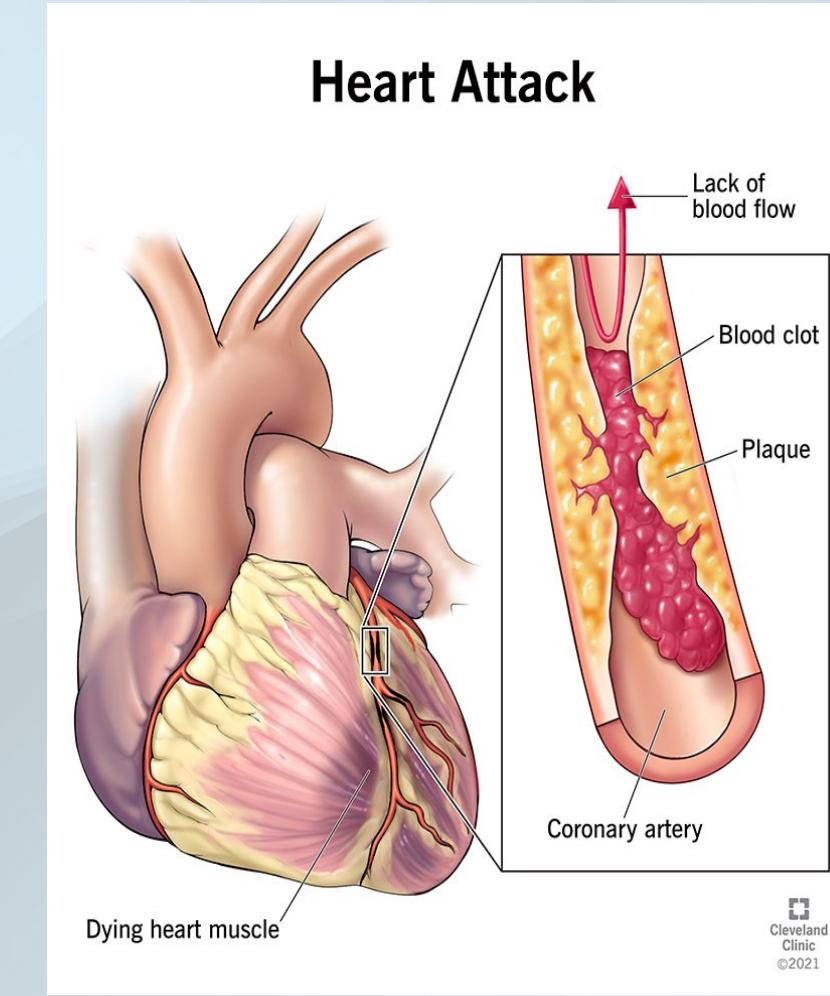
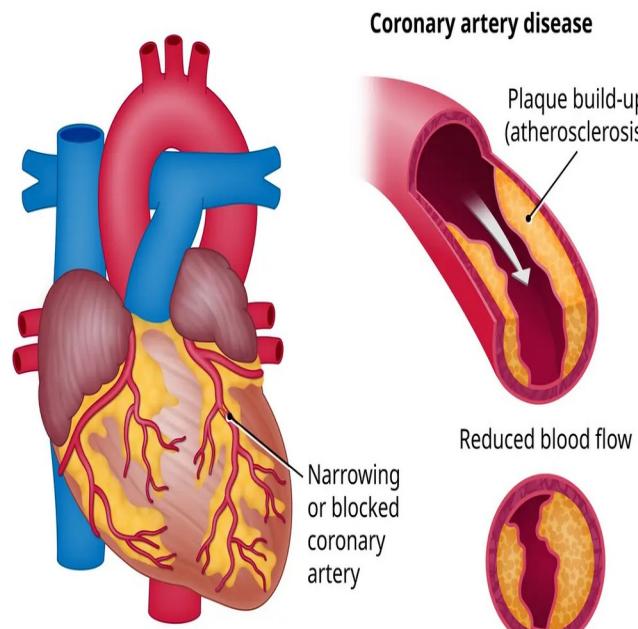
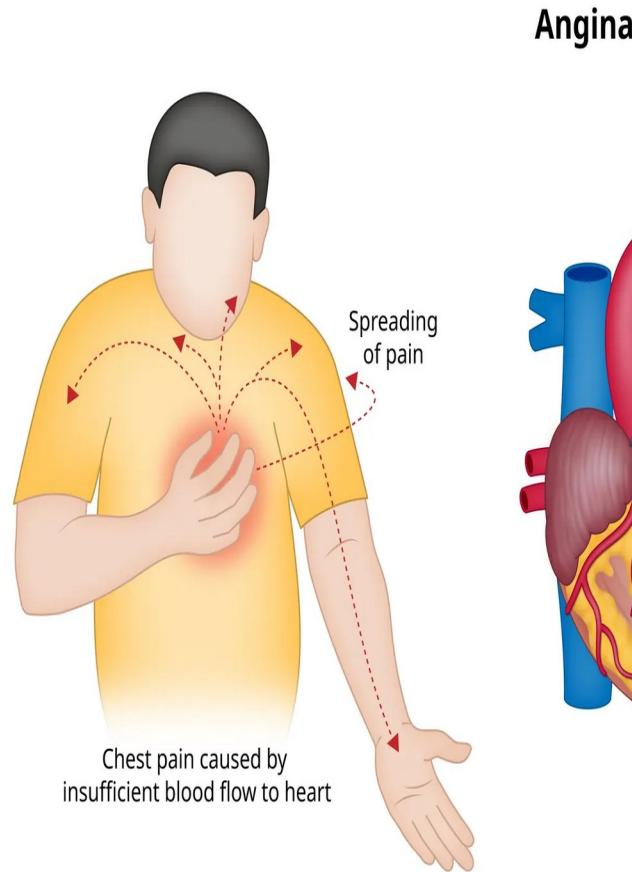
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Postural (Orthostatic Hypotension) and Heart Failure



Angina Pectoris and Heart Attack



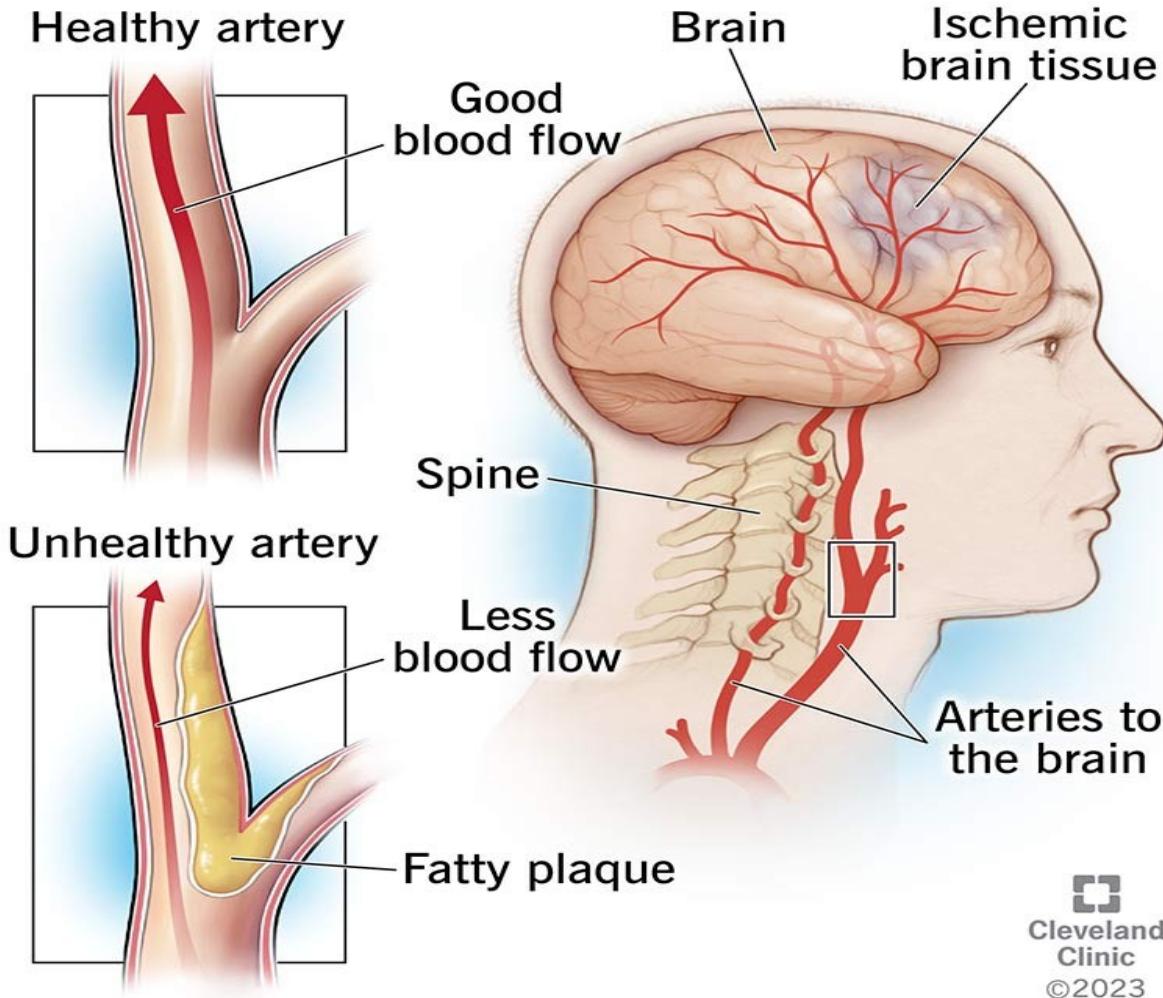
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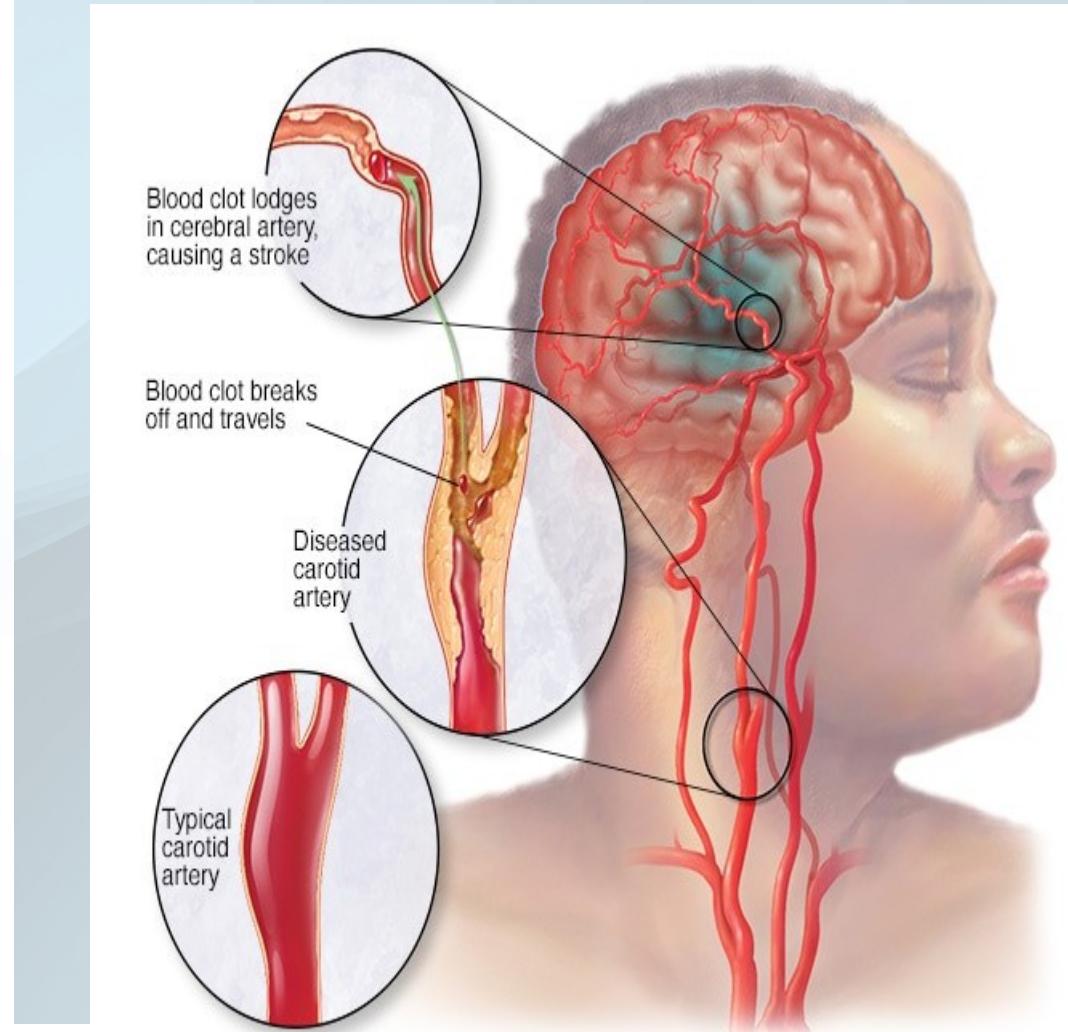


Transient Ischemic Attack and Ischemic Cerebrovascular Accident (Stroke)

Transient Ischemic Attack



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Promoting Wellness of the Cardiovascular System

- Eat a low-saturated fat diet and maintain optimal LDL cholesterol, triglyceride, and HDL cholesterol levels. The Mediterranean diet and DASH diet are heart-healthy diets. The Mediterranean diet limits or excludes red meat, includes healthy meat such as fish and poultry, vegetables, fruit, nuts, whole grains, very limited sweets, and heart healthy oil such as olive oil. The DASH diet is especially recommended for those with hypertension since it very similar to the Mediterranean diet but explicitly limits sodium intake.
- Exercise is important, especially aerobic. At least 150 minutes of aerobic exercise weekly is recommended. Strength training at least 2-3 times weekly is recommended.
- Have regular checkups by your health care provider.