



CIRCULATORY SYSTEM: DISEASES

DHO8
7.8, pg 197

OBJECTIVES

Discuss the diseases and disorders of the cardiovascular system and related signs, symptoms, and treatment methods.

Identify the following diseases and disorders:

Aneurysm	Iron deficiency anemia	Aplastic anemia
Arteriosclerosis	atherosclerosis	Congestive heart failure
Embolus	hemophilia	hypertension
Leukemia	myocardial infarction	pernicious anemia
Phlebitis	sickle cell anemia	varicose veins

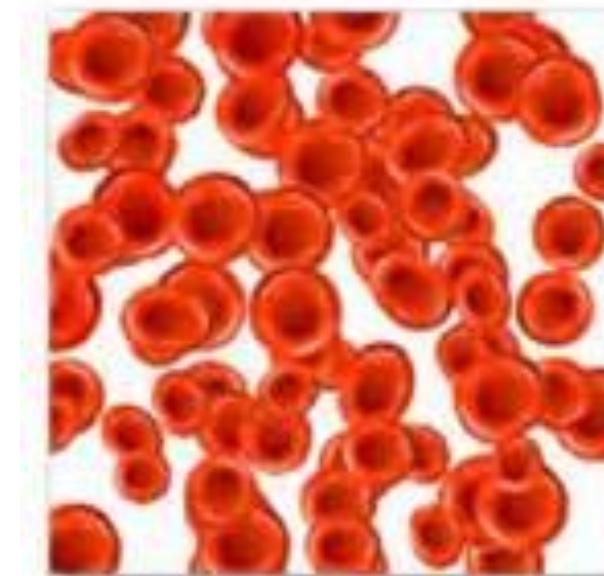
ANEMIA

- Inadequate number of RBCs, hemoglobin, or both
- Symptoms: pallor (paleness), fatigue, dyspnea (difficult breathing), & rapid heart rate

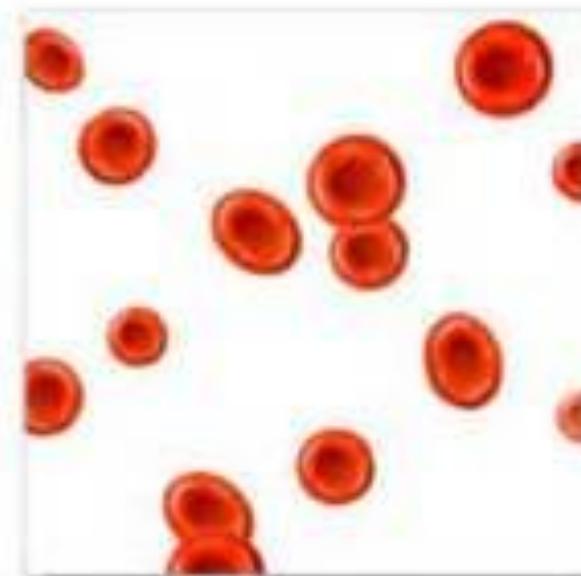
Types of anemia:

1. Acute-blood loss anemia
2. Iron deficiency anemia
3. Aplastic anemia
4. Pernicious anemia
5. Sickle cell anemia

Normal amount of red blood cells



Anemic amount of red blood cells



ACUTE-BLOOD LOSS ANEMIA

Caused by hemorrhage (rapid blood loss)



Treated by blood transfusions



IRON DEFICIENCY ANEMIA

➤ Cause: inadequate amount of iron to form hemoglobin in RBCs

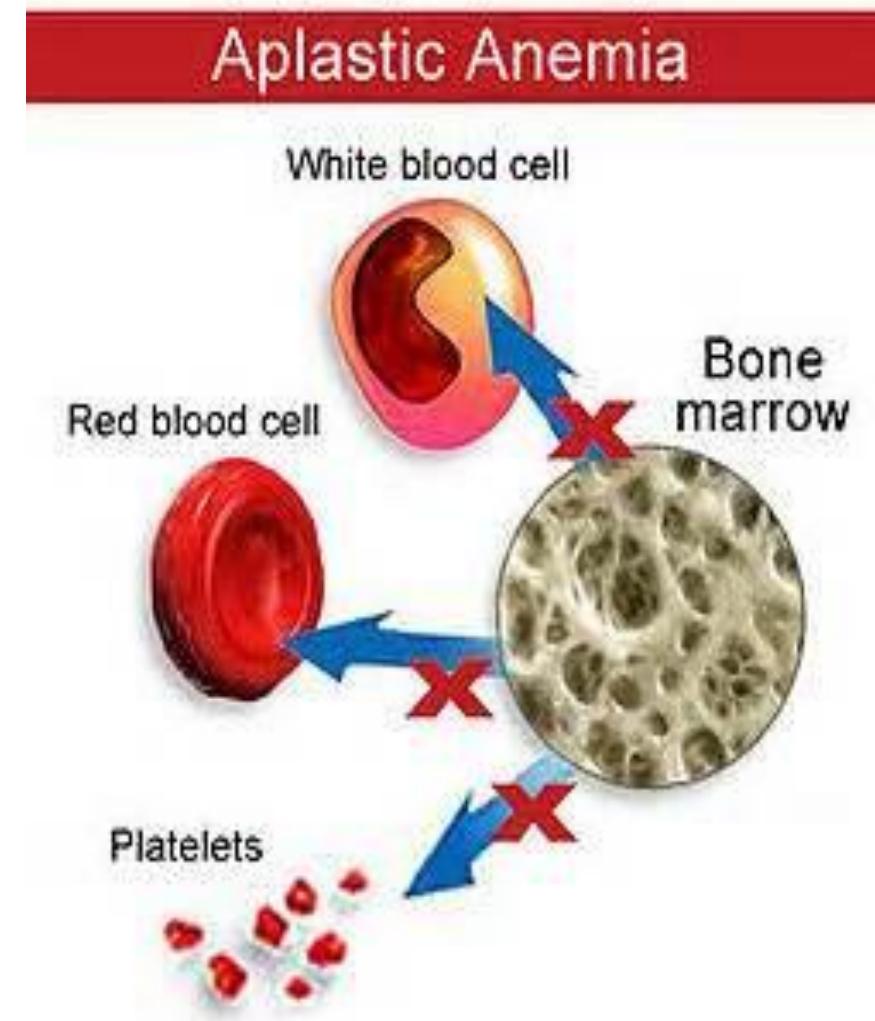
➤ Treatment: Iron supplements, increase iron in the diet (green leafy vegetables)

➤ <https://www.youtube.com/watch?v=obgXcNaDLJU>
(3:55) Living With and Managing Iron-Deficiency Anemia



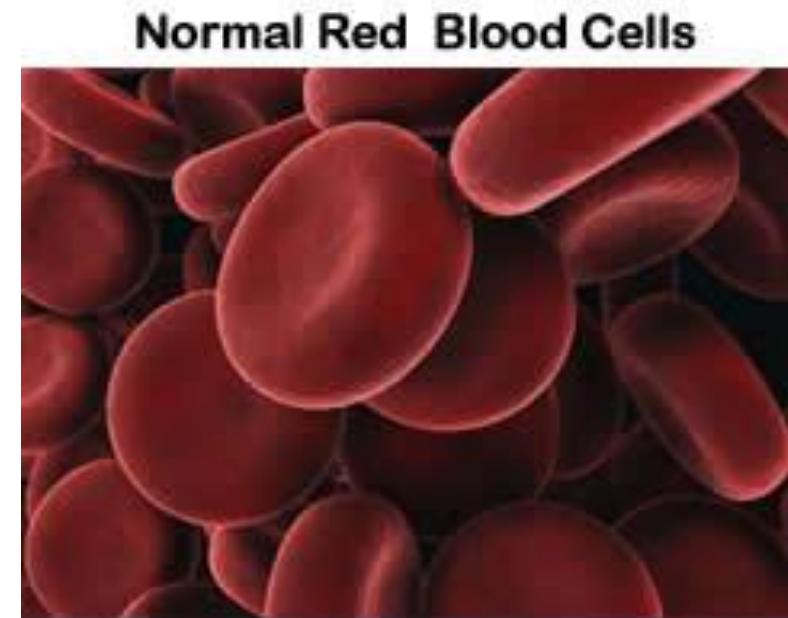
APLASTIC ANEMIA

- Injury to or destruction of the bone marrow, leading to poor or no formation of RBCs
- Can be caused by chemotherapy, radiation, toxic chemicals, & viruses
- Treatment: eliminating the cause, blood transfusion, if severe, a bone marrow transplant
- Unless the damage can be reversed, it is frequently fatal.
- <https://www.youtube.com/watch?v=2VJlgRO7Yag&t=181s> (4:21) Aplastic Anemia



PERNICIOUS ANEMIA

- Formation of RBCs that are abnormally large in size, but inadequate in number
- Cause: lack of intrinsic factor (substance normally present in the stomach), which results in inadequate absorption of vitamin B12.
- Vitamin B12 & folic acid are required for the development of mature RBCs
- Treatment: Administer vitamin B12 injections
- <https://www.youtube.com/watch?v=nyHfCNKaArg> (1:34) Pernicious Anemia



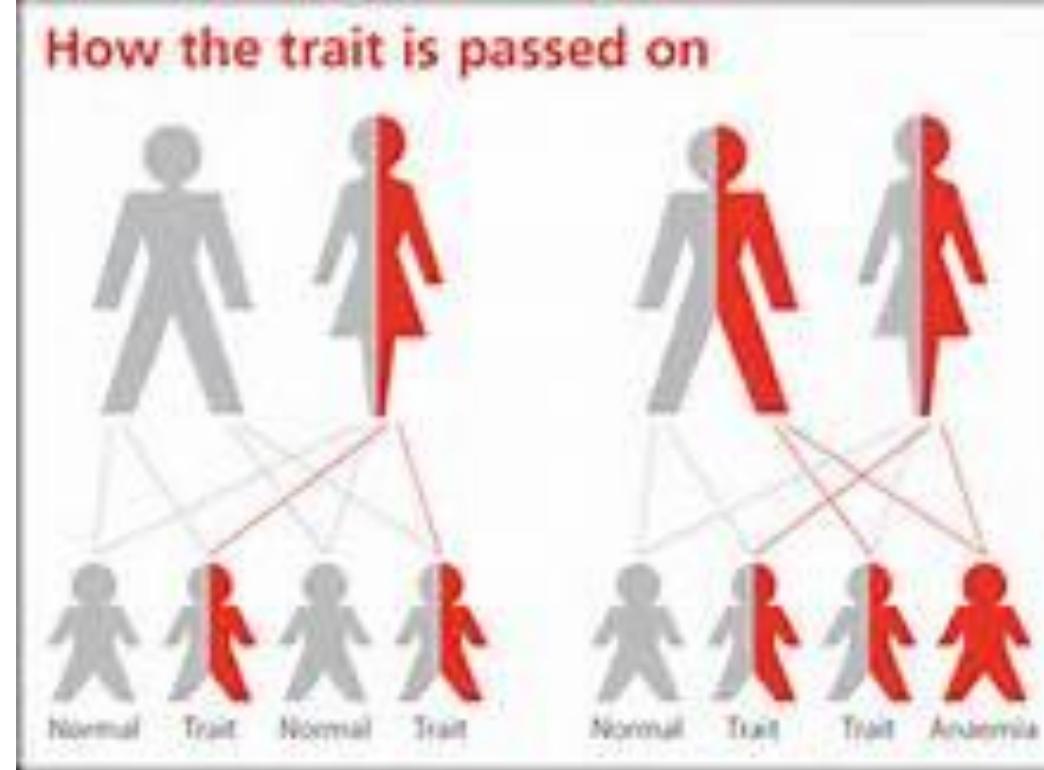
Normal Red Blood Cells



Pernicious Anemia
malformed red blood cells

SICKLE CELL ANEMIA

- Chronic, inherited anemia that results in the production of abnormal, crescent-shaped RBCs that carry less O₂, break easily, & block blood vessels
- Usually occurs in African Americans
- Treatment: blood transfusions, new research into bone marrow transplants, genetic counseling for prevention
- <https://www.youtube.com/watch?v=2CsgXHdWqVs> (5:57) Sickle Cell Anemia: A Patient's Journey



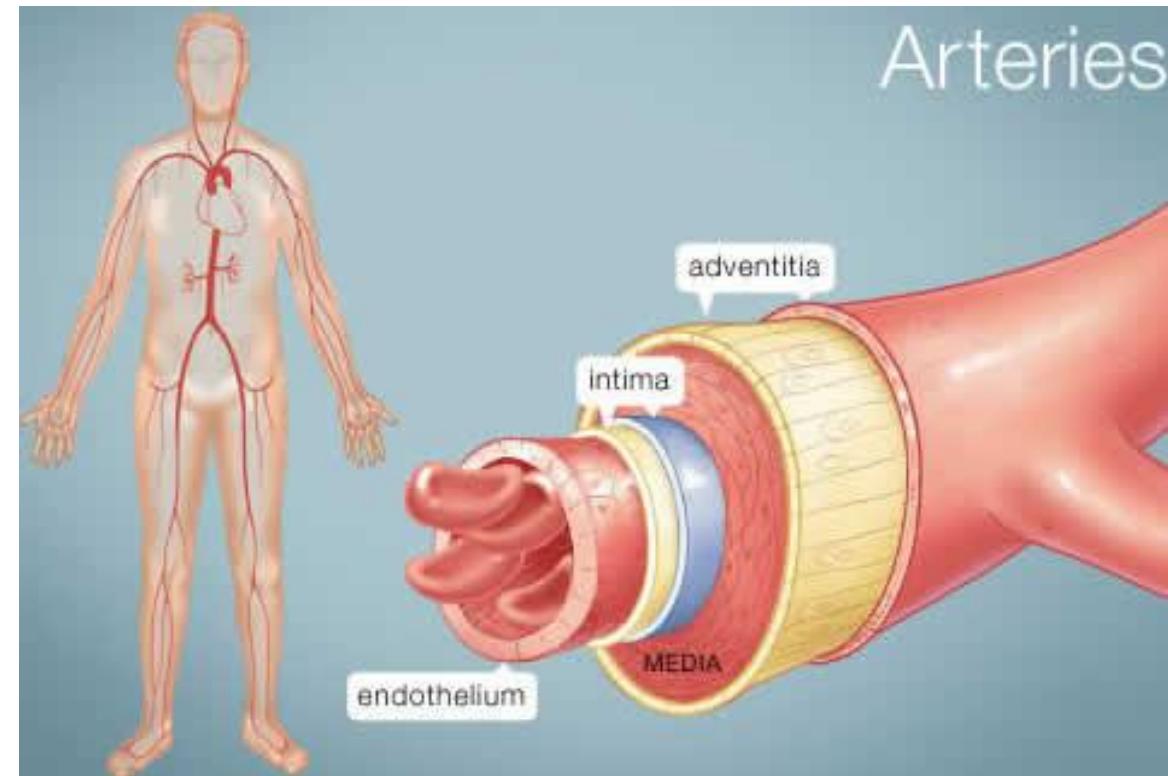
ANEURYSM



- Ballooning out of, or saclike formation on, an artery wall
- Causes: Disease, congenital defects, & injuries leading to weakened arterial walls
- Common sites are cerebral, aortal, abdominal arteries
- If aneurysm ruptures, hemorrhaging can occur which can cause death
- Treatment: Surgically removing the damaged area of blood vessel & replacing it with a graft or another vessel
- <https://www.youtube.com/watch?v=LzbsBrgIJfk> (2:32) What is an aneurysm?

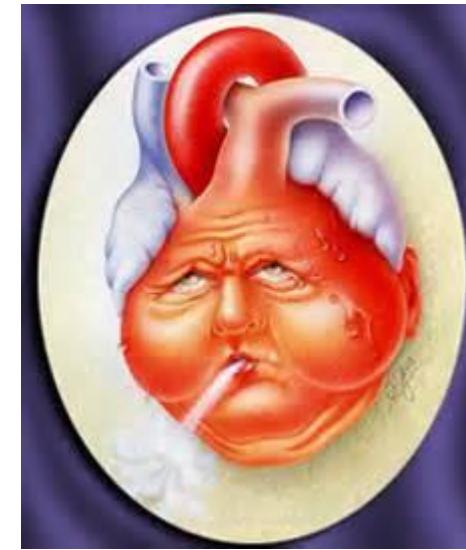
ARTERIOSCLEROSIS

- Hardening or thickening of the arterial walls, resulting in a loss of elasticity & contractility.
- Commonly occurs as a result of aging
- Can cause high BP, lead to aneurysms
- Treatment: lower BP with diet &/or meds



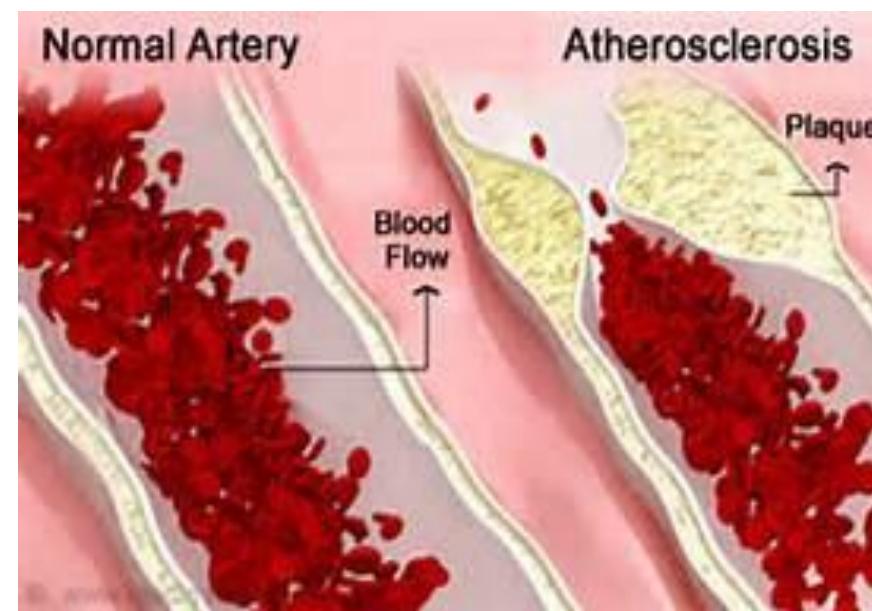
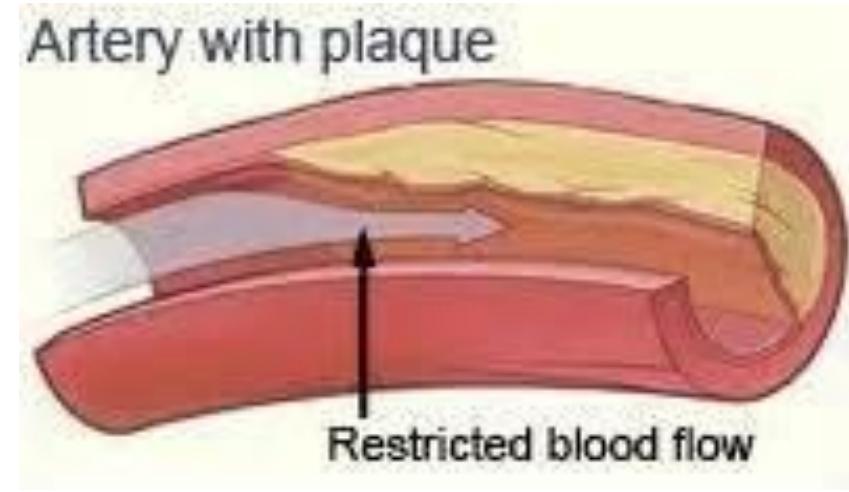
CONGESTIVE HEART FAILURE (CHF)

- <https://www.youtube.com/watch?v=mhYeO2fwSps> (5:50) Heart Failure
- Occurs when heart muscles don't beat adequately to supply the blood needs of the body
- Can be right sided or left sided
- Symptoms: edema, dyspnea, pallor, cyanosis, distention of the neck veins, weak & rapid pulse, cough with pink, frothy sputum
- Treatment: cardiotonic drugs (slow & strengthen heartbeat), diuretics, elastic support hose, O₂ therapy, bedrest, low-sodium diet



ATHEROSCLEROSIS

- Fatty plaques (cholesterol) are deposited on the walls of the arteries
- Plaques narrow the arterial opening which reduces or eliminates blood flow
- If plaques break loose, they can circulate through the bloodstream as emboli
- Treatment: low cholesterol diet, meds to lower cholesterol, stop smoking, reduce stress, exercise

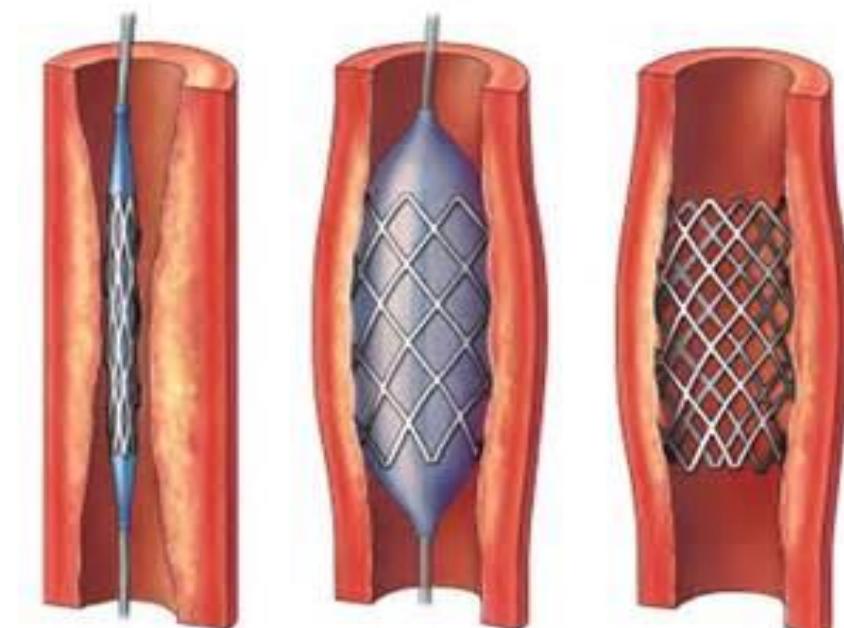
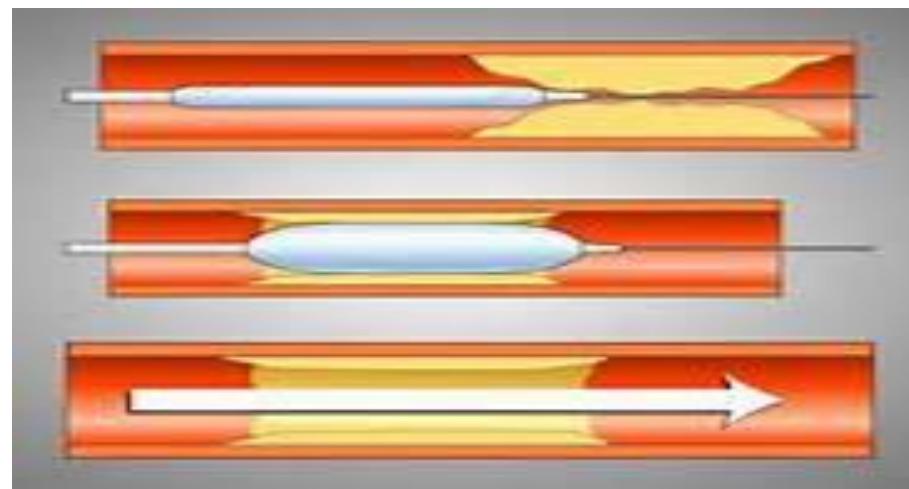
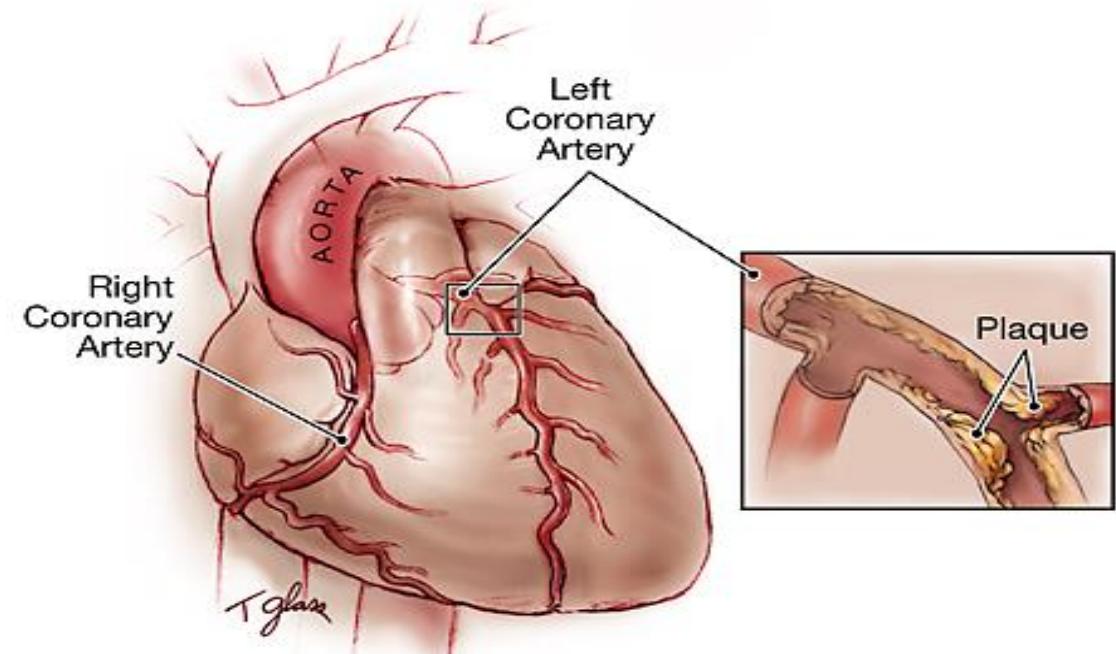


ATHEROSCLEROSIS

➤ Surgical treatments: angioplasty to remove or compress plaques, stents to open arteries, bypass if arteries are completely blocked

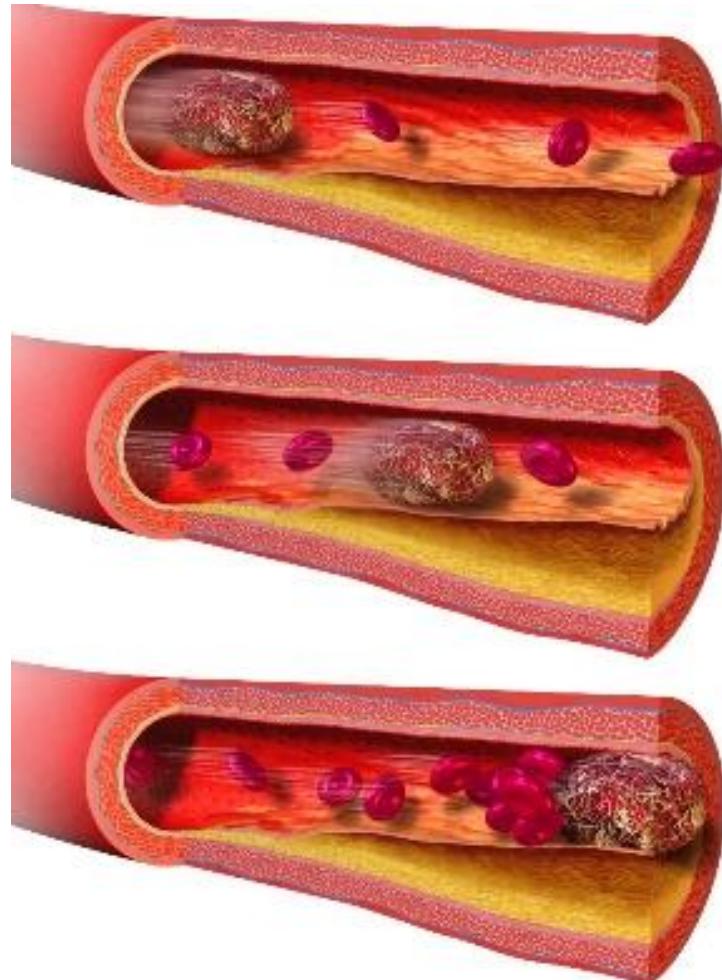
➤ <https://www.youtube.com/watch?v=vw6OKJu07NE> (2:25) animated CABG

➤ https://www.youtube.com/watch?v=BVkJHT_mJ4w (19:43) actual CABG



EMBOLUS

- Foreign substance circulating in the bloodstream
 - Can be air, blood clot, bacterial clumps, fat globule
 - If embolus enters an artery or capillary too small for it to pass through, it will block the vessel
- https://www.youtube.com/watch?v=XgTRS_InDgg (2:29) What are Thrombosis & Embolism?



HEMOPHILIA

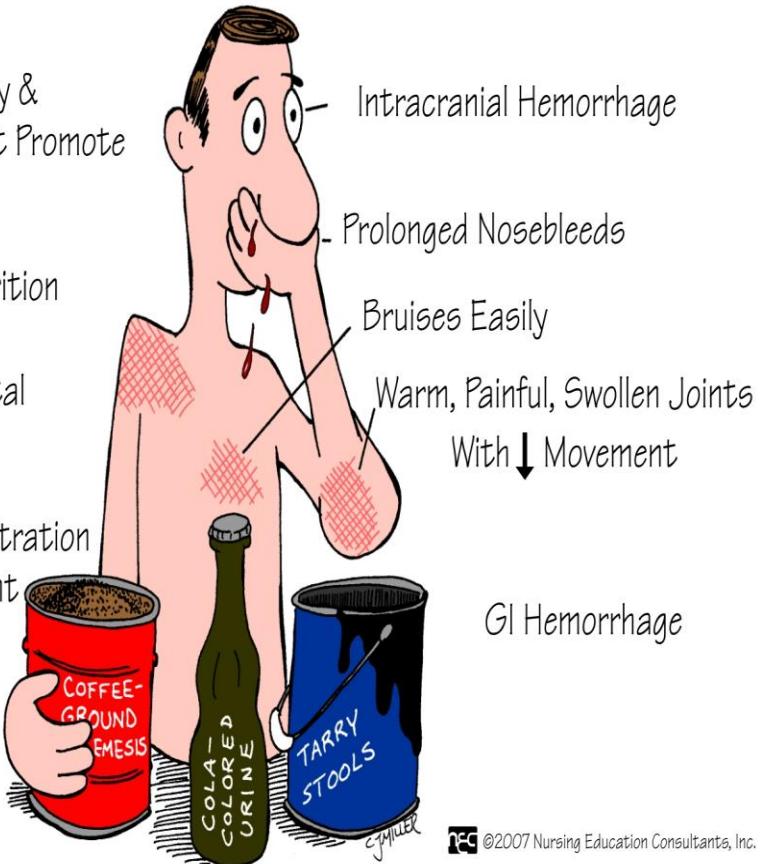
- Inherited disease that occurs mostly in males and can be carried by females
- Lack of plasma protein=blood is unable to clot (clotting process)
- Minor cut lead to prolonged bleeding
- Minor bump lead to internal bleeding
- Trx: transfusing whole blood or plasma; administering protein factor



HEMOPHILIA

(Inherited Blood Disorder
Factor VIII, Classic, or Type A)

- No Cure
- Avoid Injury & Meds That Promote Bleeding
- Good Nutrition
- Good Dental Hygiene
- IV Administration Of Deficient Clotting Factor

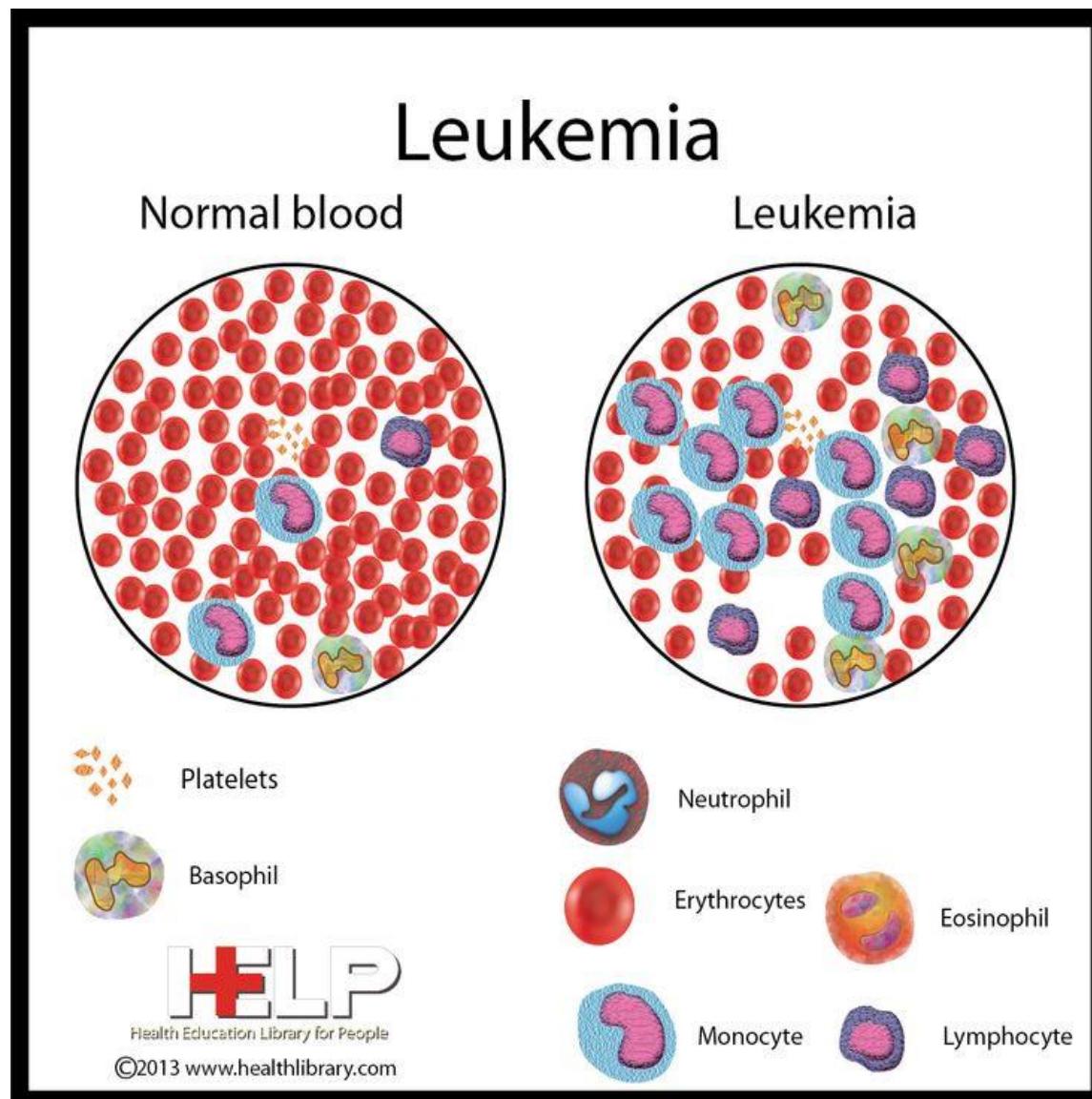


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LEUKEMIA

- Malignant disease of bone marrow or lymph tissue
- Results in high number of immature white blood cells
- Can be acute or chronic
- Symptoms: fever, pallor, swelling of lymphoid tissues, fatigue, anemia, bleeding gums, excessive bruising, joint pain
- Treatment: varies with type of leukemia, but can be chemotherapy, radiation, and/or bone marrow transplant



[HTTPS://WWW.YOUTUBE.COM/WATCH?V=TJLPPKCTOIS](https://www.youtube.com/watch?v=TJLPPKCTOIS)

12 Y/O GETS DREAM COME TRUE (1.29)

Symptoms Of Leukemia

Systemic

Weight loss
Fever
Frequent infection

Lungs

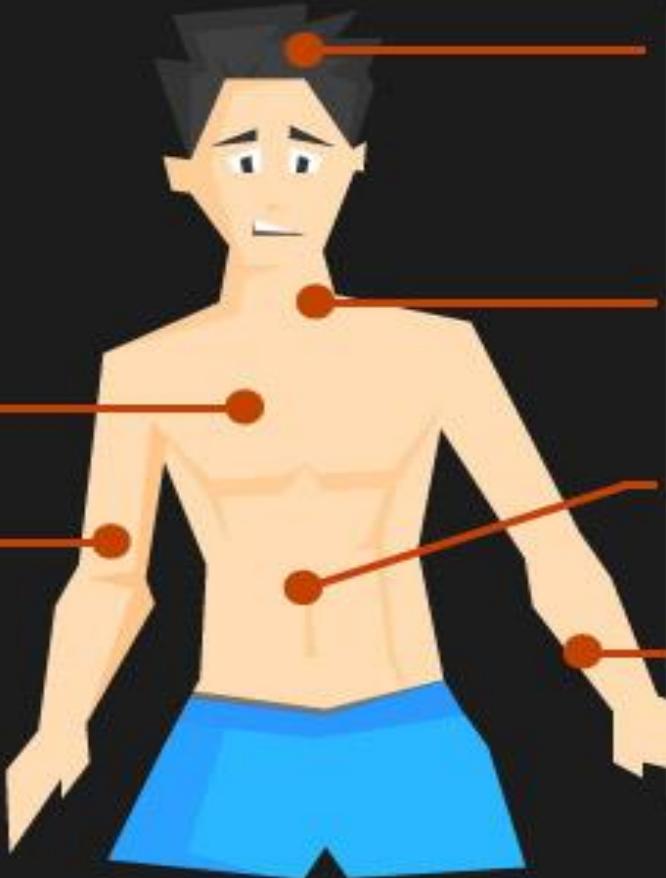
Easy shortness
or breath

Muscular

Weakness

Bones or joints

Pain or tenderness



Psychological

Fatigue
Loss of appetite

Lymph nodes

Swelling

Spleen&/or Liver

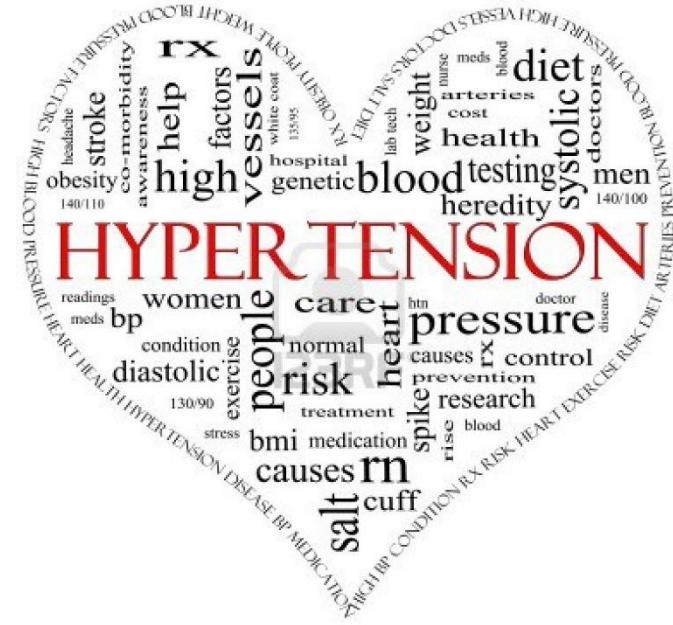
Enlargement

Skin

Night sweats
Easy bleeding
Purplish patches

HYPERTENSION

- Aka high blood pressure
 - Above 140/90
 - Risk factors: family hx, race, obesity, stress, smoking, aging, diet in high sat fat
 - Higher incidence in African Americans
 - Treatment: BP meds, diuretics, limited stress, avoid tobacco, low Na or low fat diet
 - Permanent damage to heart, blood vessels, and kidneys if not treated



MYOCARDIAL INFARCTION

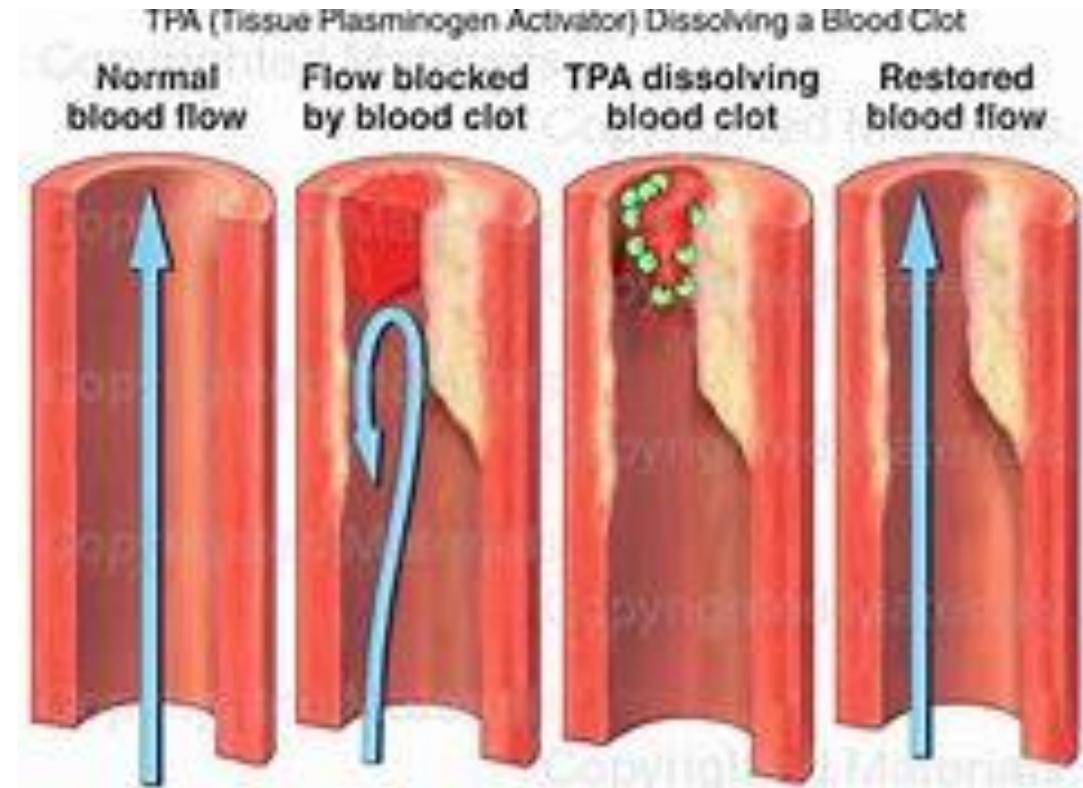
- Aka heart attack
- Blockage in coronary artery cuts off blood supply to heart
- Affected heart tissue dies=infarct
- Symptoms: severe crushing pain (angina pectoris) that radiates to arm, neck, and jaw; pressure in chest, perspiration and cold, clammy skin, dyspnea, change in BP



➤ https://www.youtube.com/watch?v=zKFKNMe5J_Q (2 min)

Nursing 102: What to do during a heart attack!

➤ Treatment: **Immediate:** CPR, clot-busting (thrombolytic) drugs like streptokinase or TPA may open blood vessel & restore blood flow; must be used within first several hours & prohibited if bleeding present



➤ Treatment: **Additional:** complete bedrest, pain meds, vasodilators, cardiotonic drugs, O₂ therapy, anticoagulants, and control arrhythmias; angioplasty, stenting, CABG

➤ Treatment: **Long term:** BP control, diet low in cholesterol and saturated fat, no tobacco and stress, regular exercise, weight control



**"What fits your busy schedule better,
exercising one hour a day or being
dead 24 hours a day?"**

PHLEBITIS

- Inflammation of a vein, usually in the leg
- Thrombophlebitis=formation of clot
- Symptoms: pain, edema, redness, discoloration at site
- Treatment: anticoagulants, pain meds, elevate affected area, antiembolism/support hose, surgery to remove clot



VARICOSE VEINS

- Dilated and swollen veins that lost elasticity and caused stasis (decreased blood flow)
 - Occurs in legs
 - Results from: pregnancy, prolonged standing or sitting, hereditary factors
 - Treatment: exercise, antiembolism/support hose, avoidance of prolonged sitting or standing, avoidance of tight or restrictive clothes, surgery to remove vein
-
- <https://www.youtube.com/watch?v=9AUx1bF3RIQ> (1.18)
No knife endovenous laser







CIRCULATORY DISEASES

Review
Questions



TEST YOUR KNOWLEDGE?

Jasmine is diagnosed with an aneurysm. What is wrong with one of her arteries?

- a) It is missing
- b) It is twisted
- c) There is a weakness in the wall
- d) There is a clot that is stuck

?



TEST YOUR KNOWLEDGE?

The blood condition characterized by crescent-shaped RBCs that carry less O₂, break easily, & block blood vessels is known as:

- a) Sickle cell anemia
- b) Pernicious anemia
- c) Iron deficiency anemia
- d) Aplastic anemia

A

TEST YOUR KNOWLEDGE?

Administering vitamin B12 injections is the treatment for which type of anemia?

- a) Sickle cell anemia
- b) Pernicious anemia
- c) Aplastic anemia
- d) Iron deficiency anemia



TEST YOUR KNOWLEDGE?

Anemia could be caused by a lack of:

- a) Monocytes
- b) Thrombocytes
- c) Hemoglobin
- d) Plasma



C

TEST YOUR KNOWLEDGE?

True or False?

Angioplasty may be used to remove or compress deposits in arteries, or to insert a stent to allow blood flow.

True

I really

you a question

What is the disease that occurs when fatty plaques are deposited on the walls of arteries?

atherosclerosis

TEST YOUR KNOWLEDGE

Your friend has pain, edema and redness in the lower leg. What would cause those symptoms?

- A) phlebitis
- B) congestive heart failure
- C) myocardial infarction
- D) leukemia

Correct answer: A

TEST YOUR KNOWLEDGE?

Which of the following “cause-and-effect” statements is true?

- a) Lack of iron causes an aneurysm
- b) Arteriosclerosis causes hypertension
- c) Embolus causes congestive heart failure
- d) An arrhythmia causes an aneurysm



TEST YOUR KNOWLEDGE

A hematologist would most likely treat someone with:

- A) varicose veins
- B) myocardial infarction
- C) hemophilia
- D) Arrhythmia

Correct answer: C

TEST YOUR KNOWLEDGE

Which disorder could be treated with chemo, radiation, or bone marrow transplant?

- A) MI
- B) hypertension
- C) atherosclerosis
- D) leukemia

Correct answer: D

TEST YOUR KNOWLEDGE

Which of the following is not a risk factor that increases the incidence of hypertension?

- A) smoking
- B) race
- C) excessive exercise
- D) obesity

Correct answer: C

TEST YOUR KNOWLEDGE

Why is a myocardial infarction life threatening?

- A) because a damaged heart muscle cannot pump blood effectively
- B) because swollen veins lose elasticity with decreases blood flow to organs
- C) because a minor bump or fall could lead to internal bleeding
- D) because it inhibits the exchange of O₂ & CO₂ in body cells

Correct answer: A