ANPH 1

Cardiovascular System Pathologies



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Hypertension

- Hypertension is also called high blood pressure.
- It is the leading cause of strokes and CHF.
- Blood pressure is a function of cardiac output (the amount of blood pumped per minute by the heart) and the total peripheral resistance, which reflects the condition of the walls of the blood vessels throughout the body.

Classification of Hypertension

Blood Pressure (BP) Classification			
Classification	**Systolic BP**		**Diastolic BP**
Normal	less than **120**	and	less than **80**
Prehypertension	**120-139**	or	**80-89**
High blood pressure			
Stage 1 hypertension	**140-159**	or	**90-99**
Stage 2 hypertension	greater than or equal to **160**	or	greater than or equal to **100**

Hypertensive Heart Disease

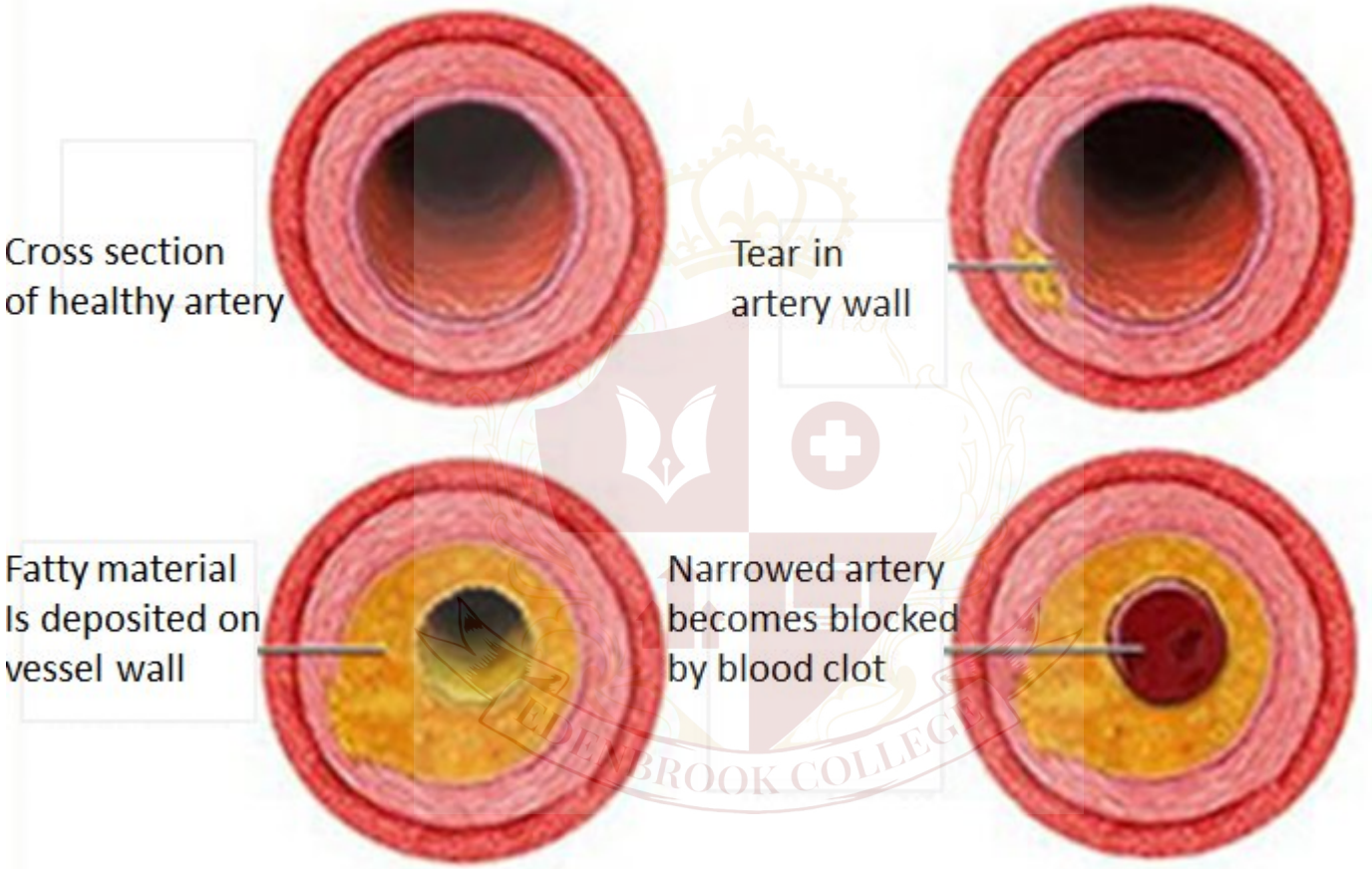
- Hypertensive heart disease are conditions caused by long-standing high blood pressure.
- Includes heart failure, thickening of the heart muscle, coronary artery disease

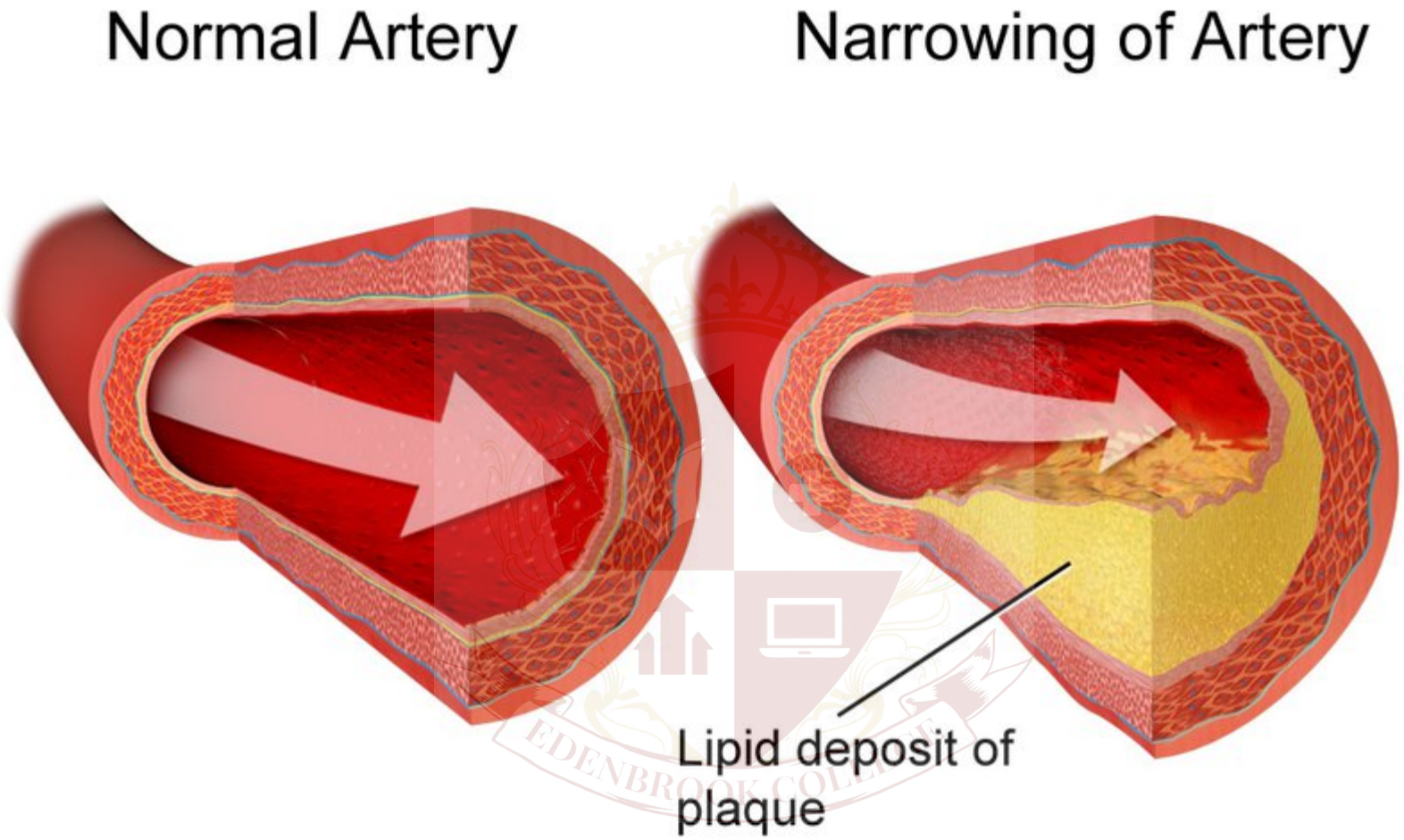
Coronary Artery Disease

- Coronary artery disease is the narrowing of the lumen of one or more of the coronary arteries.
- The most common cause is atherosclerosis – the deposition of fatty material on the inner arterial wall.
- It results in oxygen deprivation of the myocardium and ischemic heart disease.

Coronary Artery Disease

- Predisposing factors to coronary artery disease:
    - Hypertension
    - Obesity
    - Smoking
    - High-cholesterol diet
    - Lack of exercise


Cross section
of healthy artery
Tear in
artery wall
Fatty material
Is deposited on
vessel wall
Narrowed artery
becomes blocked
by blood clot



Coronary Artery Disease

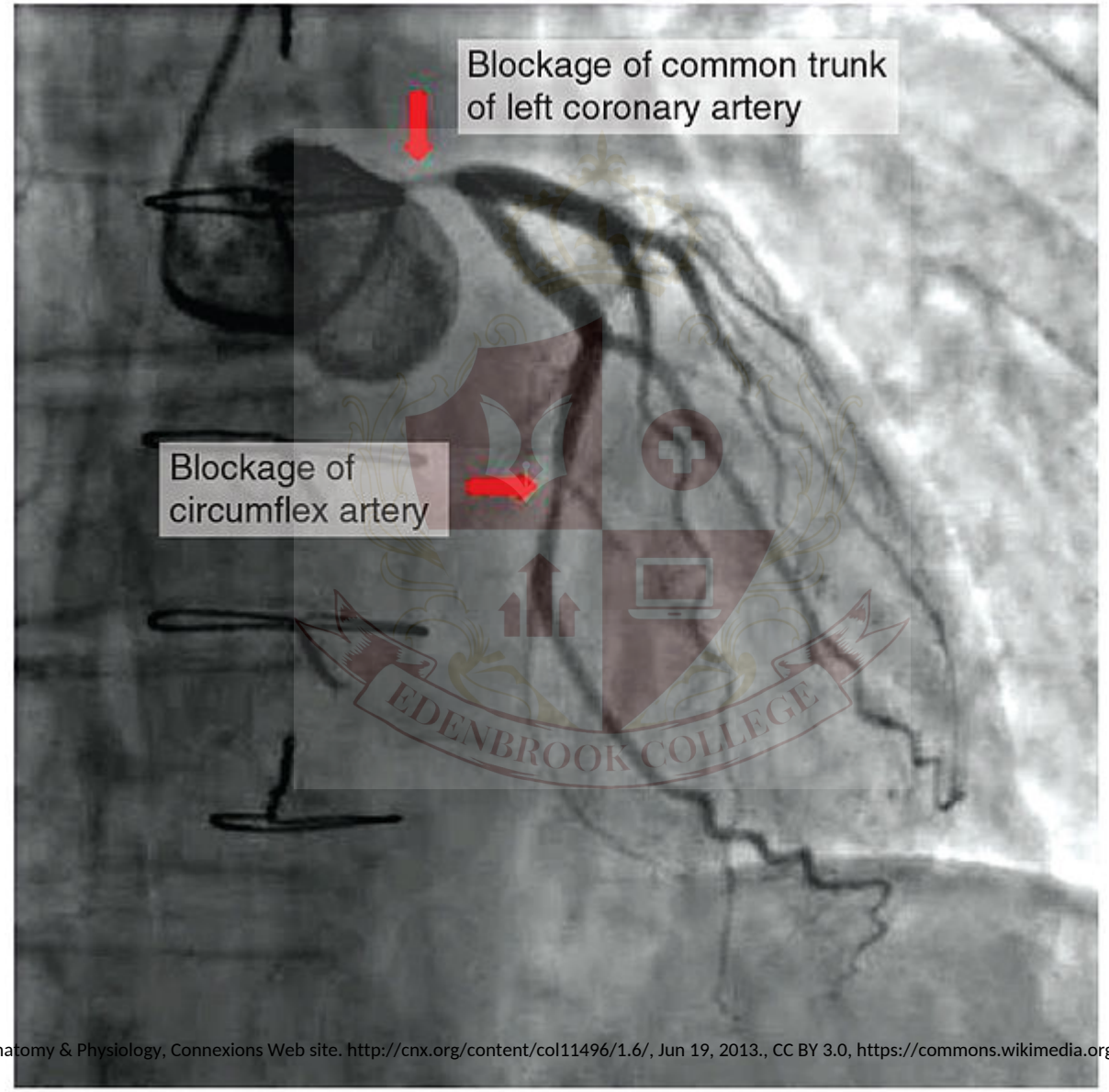
Blausen.com staff (2014). "Medical gallery of Blausen Medical 2014". *WikiJournal of Medicine* **1** (2). DOI:10.15347/wjm/2014.010. ISSN 2002-4436.

Coronary Artery Disease

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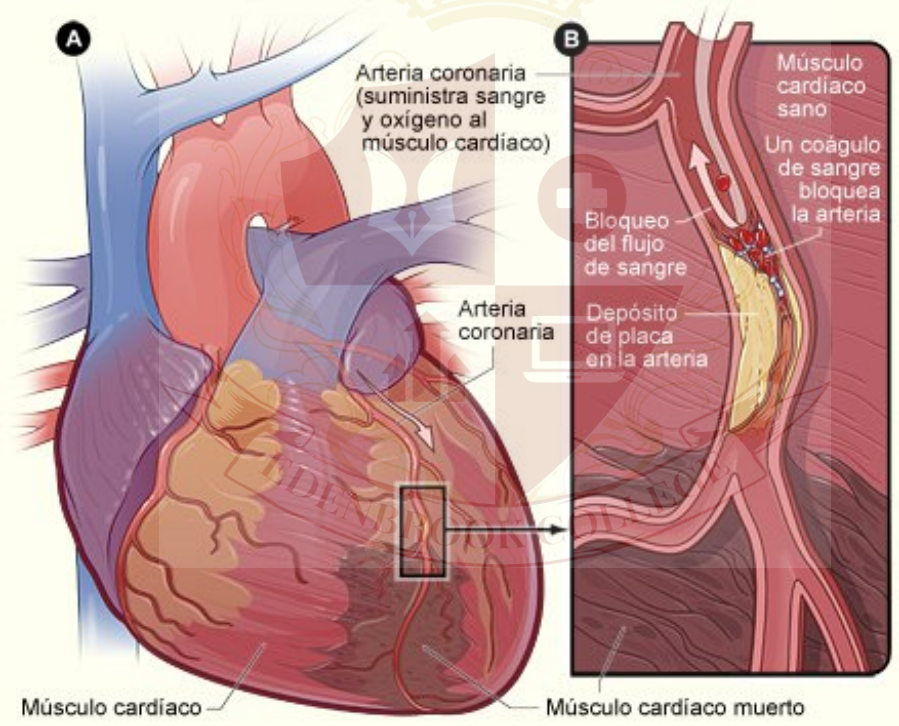
Angina Pectoris

- Refers to the temporary chest pain caused by temporary oxygen deprivation to the heart muscle, due to coronary artery disease
- The pain can be severe, often mimicking a heart attack. The pain may radiate to the jaw, neck and left arm
- The patient may feel tightness in their chest or suffocation

Myocardial infarction MI

Total occlusion of a coronary artery will deprive the muscle of its blood supply, and lead to death of the muscle cells

The extent of damage is determined by the size of the artery that is occluded.

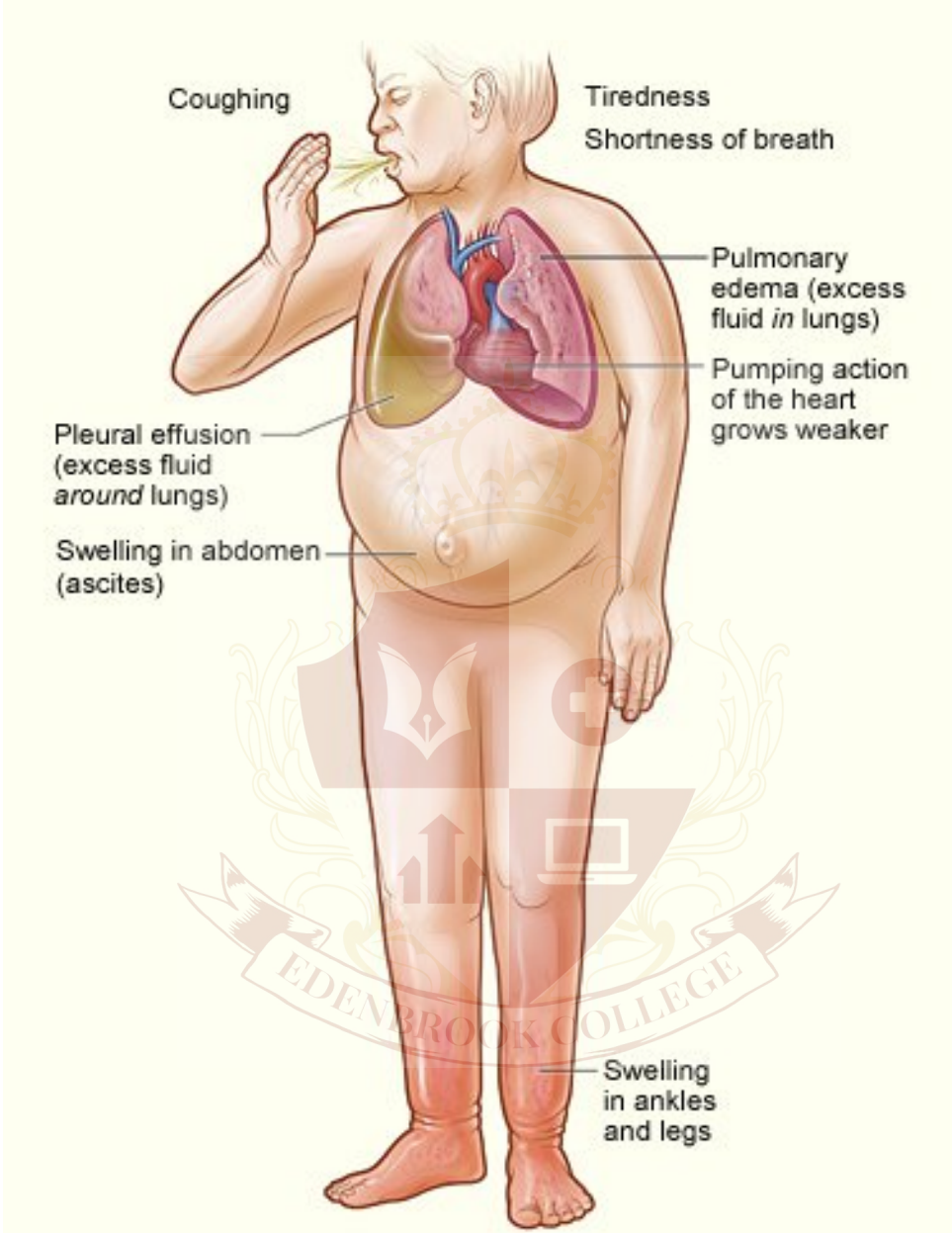


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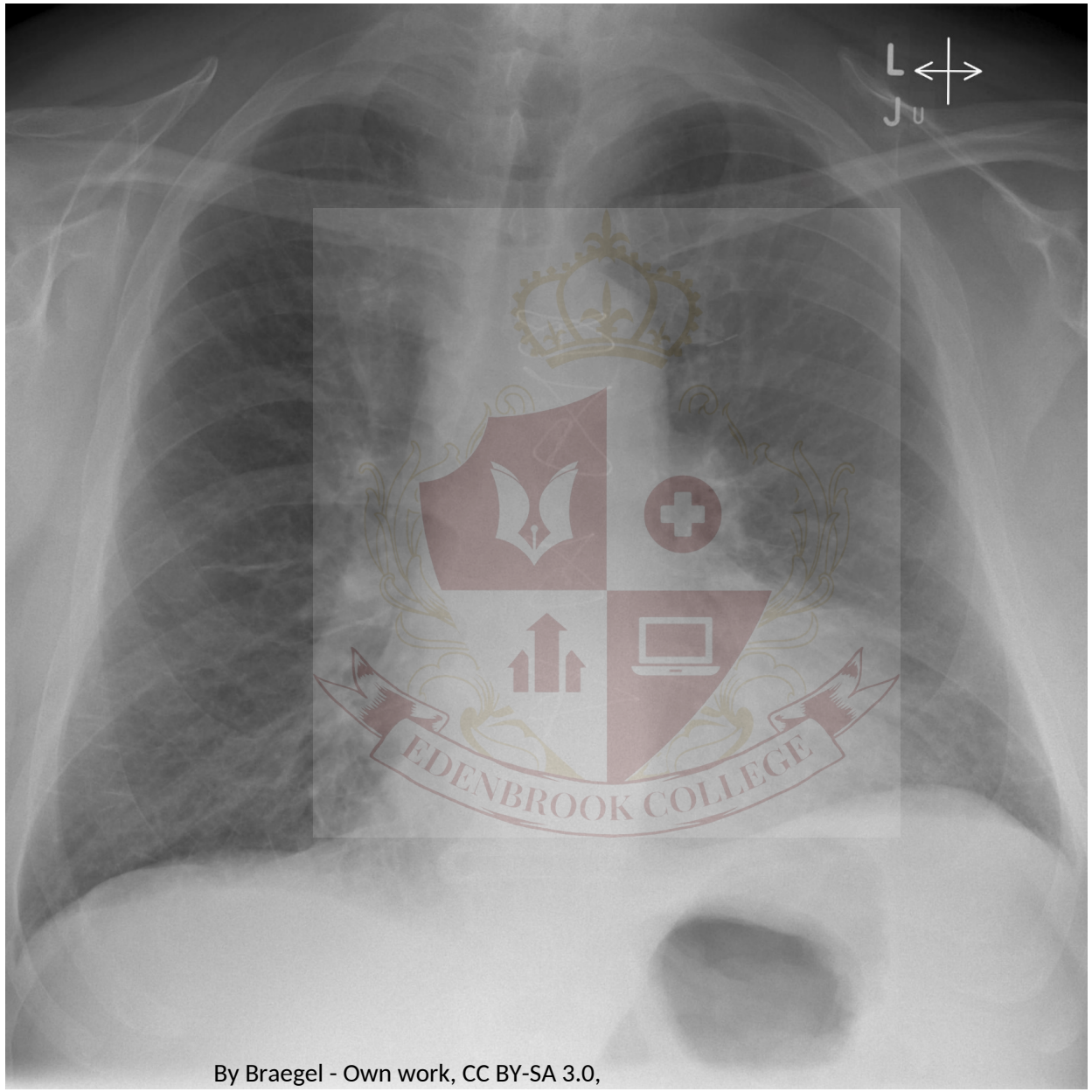
https://www.youtube.com/watch?v=H_VsHmoRQKk

Congestive Heart Failure (CHF)

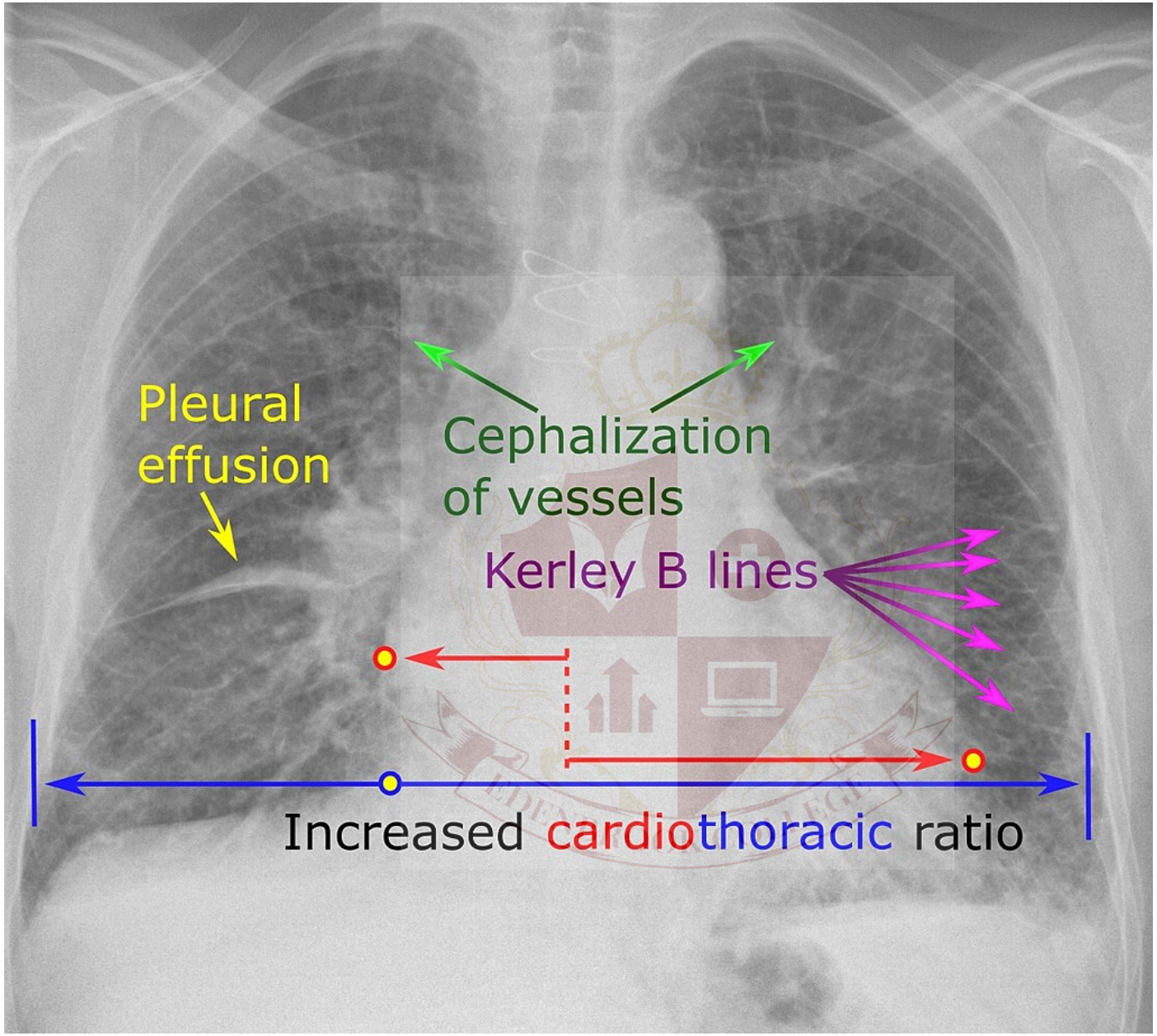
- Congestive heart failure refers to the inability of the heart to propel blood at a rate and volume sufficient to provide an adequate supply to the tissues.
- Causes of CHF include:
  - Coronary artery disease
  - High blood pressure
  - Previous heart attack
  - Cardiac abnormality
  - Any obstructive process that abnormally increases the peripheral resistance to blood flow



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Pulmonary Edema

- Pulmonary edema is an abnormal accumulation of fluid in the extravascular pulmonary tissues.

- Most common cause is an elevation of the pulmonary venous pressure.
  - It is usually due to left-sided heart failure.
  - It may also be caused by pulmonary venous obstruction or lymphatic blockade.

Aneurysm

-localized dilation of an artery
-most commonly the aorta

-it is weakness in the wall of the artery, that fills with blood,creating a bulge

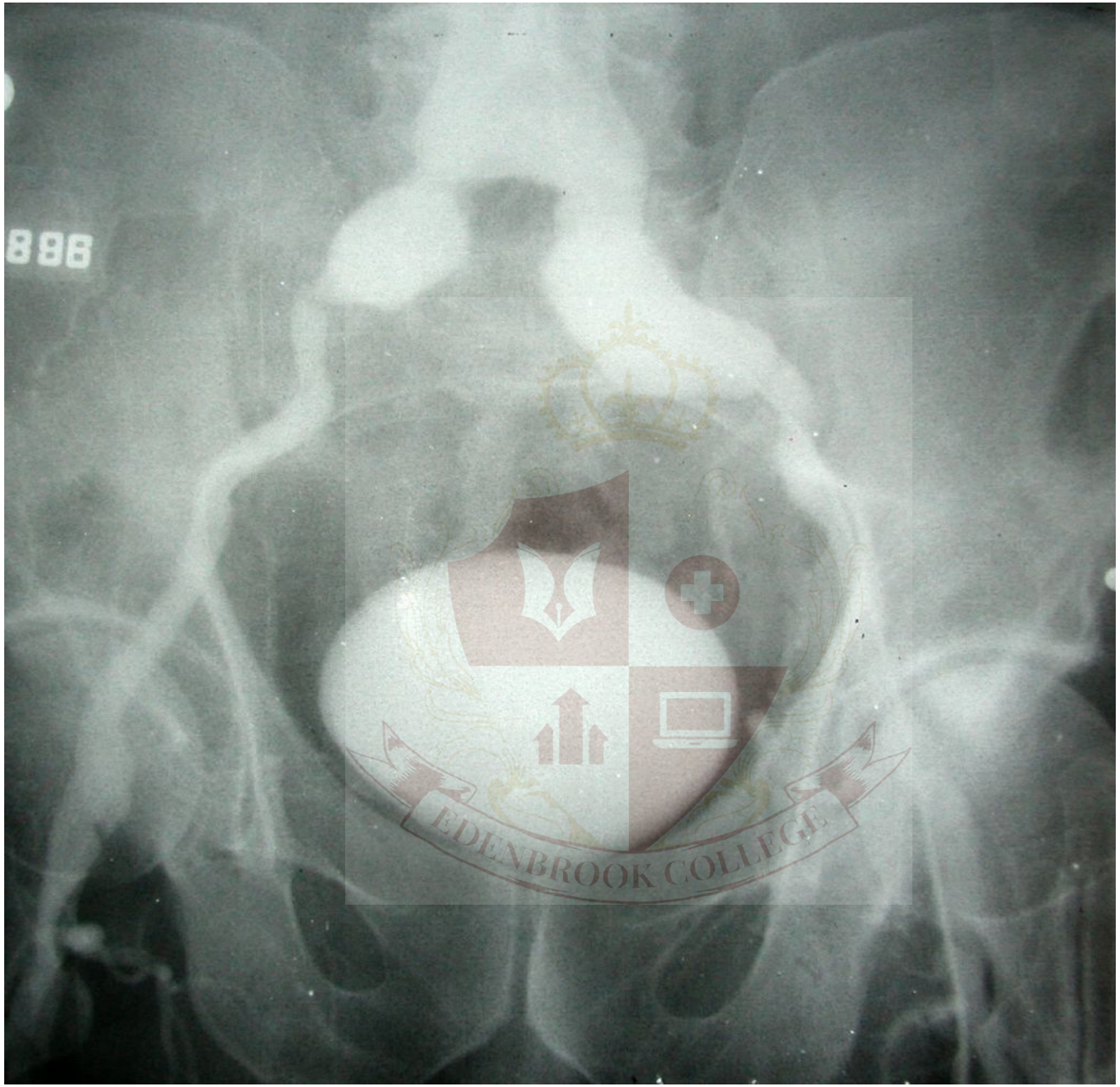
Most are asymptomatic, however at a severe stage can rupture, leading to life-threatening internal bleeding

Abdominal aorta aneurysms typically form below the level of the renal arteries



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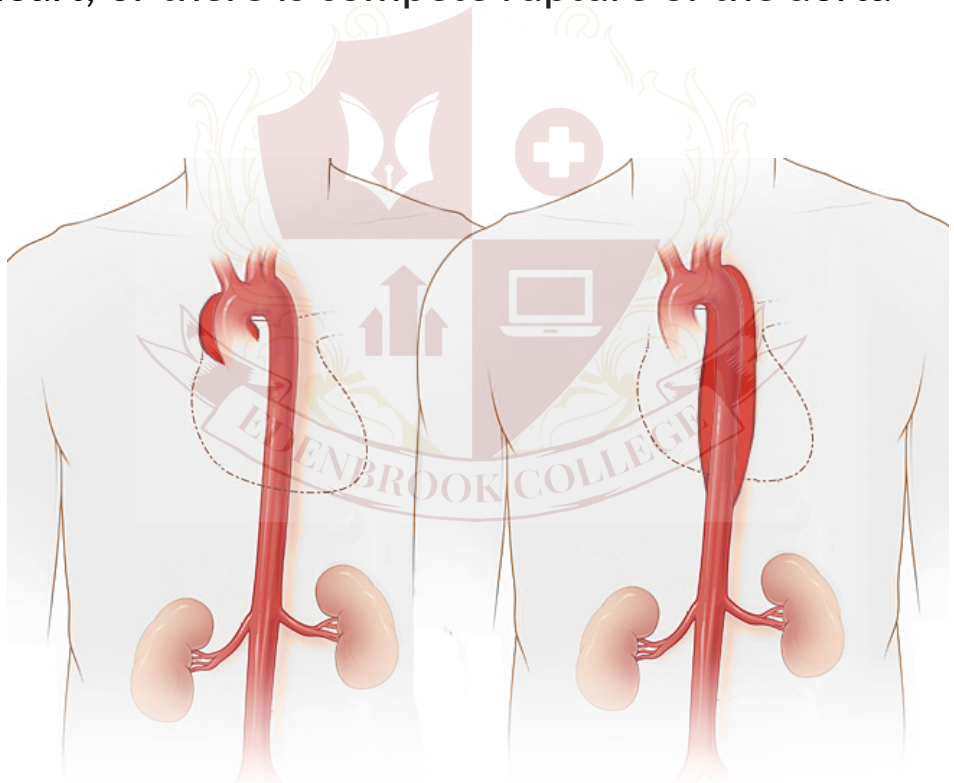




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Aortic Dissection

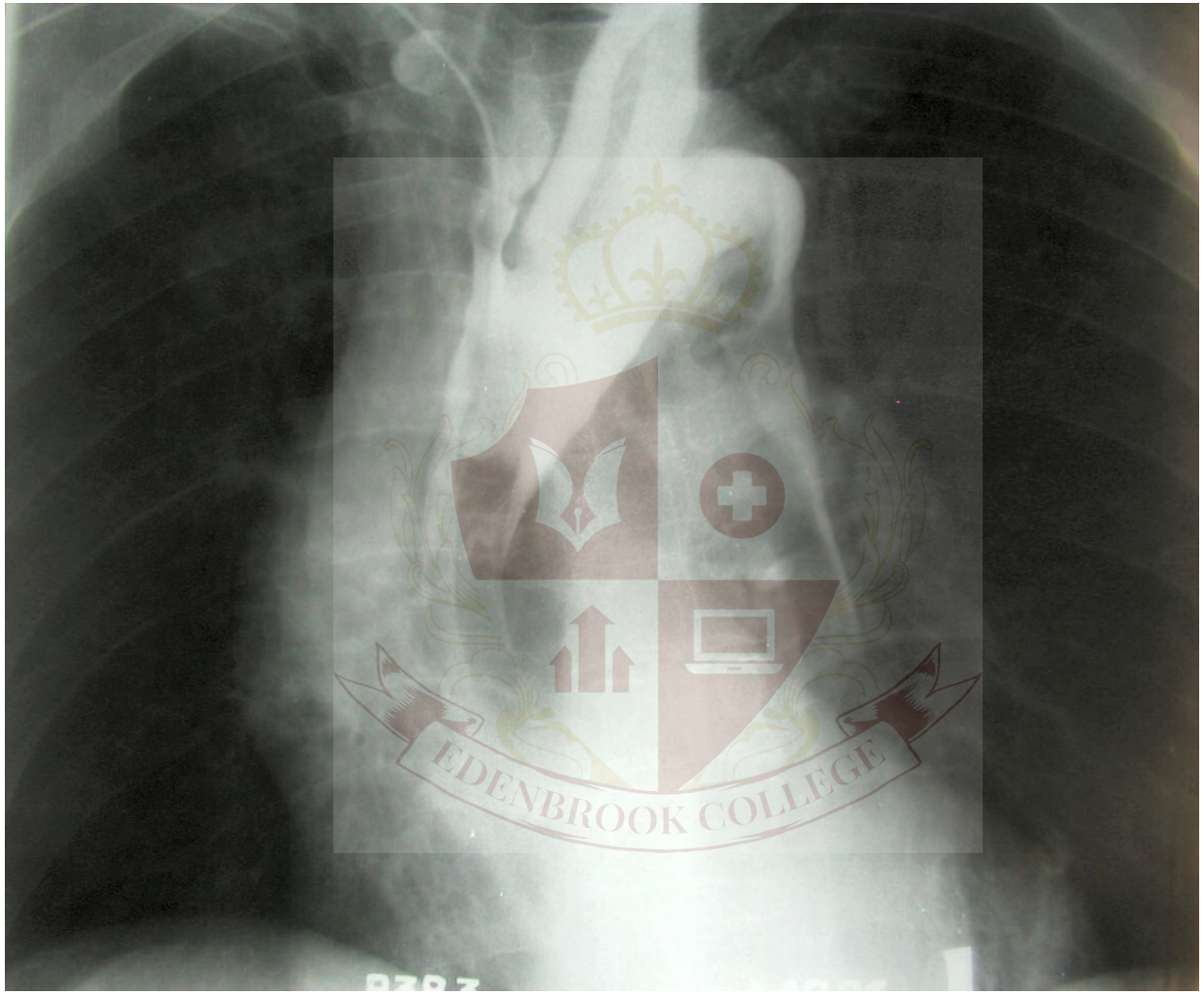
- A disruption of the intima, allowing blood to enter the wall of the aorta and separate the layers
- Sudden onset, with intense back and chest pain
- Quickly can lead to death when not enough blood is flowing to the heart, or there is compete rupture of the aorta



Proximal
(Stanford A)

Distal
(Stanford B)

Aortic Dissection



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Aortic stenosis

A narrowing of the exit from the left ventricle, may be at the valve, or above or below the valve level

- Caused by
  - Congenital bicuspid aortic valve
  - Rheumatic fever
  - Age, causing hardening of the valve

Results in an increased workload for the left ventricle, causing ventricular hypertrophy

Arteriosclerosis/ Atherosclerosis

- Arteriosclerosis is thickening, hardening and loss of elasticity in the arterial walls
- Arteriosclerosis affects small arteries and arterioles
- Atherosclerosis is a specific form of arteriosclerosis, caused by the deposit and build up of fatty plaques
- Atherosclerosis is the primary cause of coronary artery disease

Thrombus and Embolism

Thrombus: an intravascular clot that remains in place

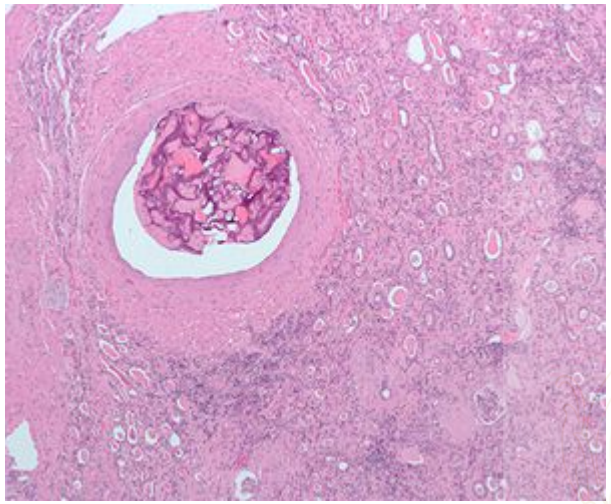
- Formed from blood coagulation in hemostasis
- Consists of aggregated platelets and red blood cells

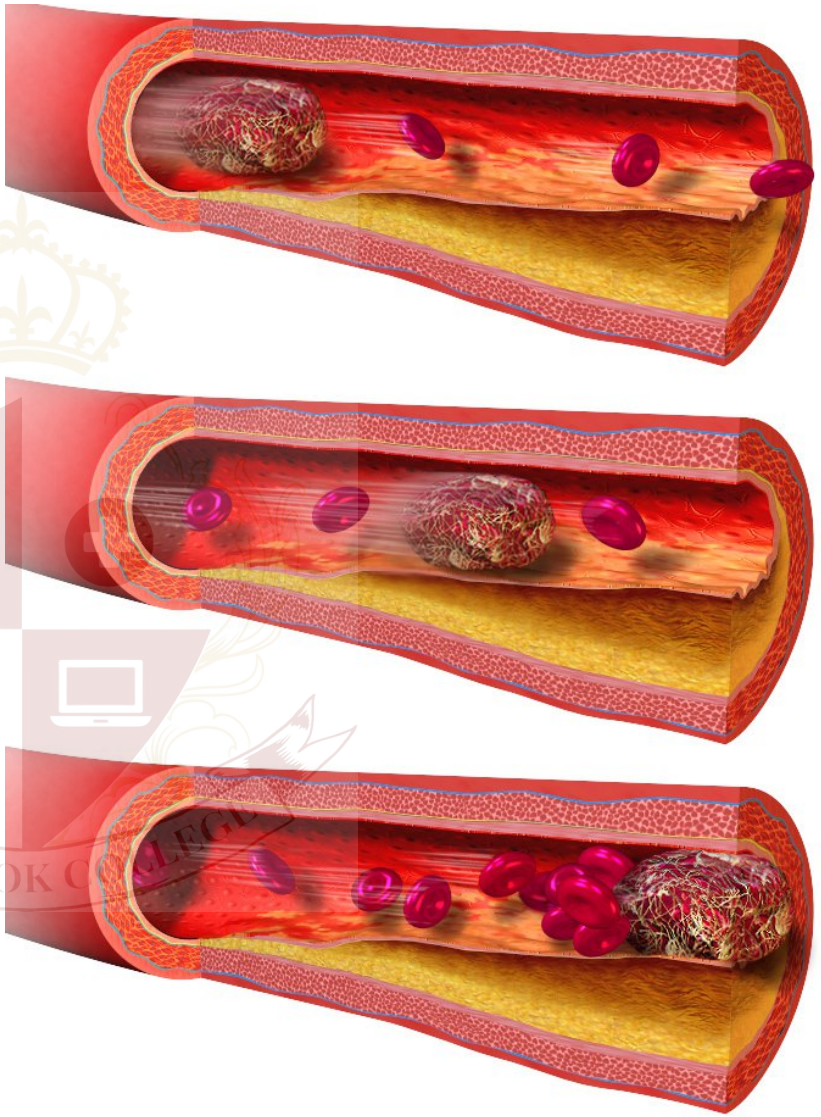
Thrombosis is the formation of a blood clot in a vessel that obstructs the flow of blood

Embolus: an unattached mass that travels through the circulatory system, potentially blocking flow at a distant site from its origin

- Can be blood clots, cholesterol plaques, fat globules, gas bubbles and foreign bodies

Embolism: a piece of material that has broken off from its original location and moves to another location causing a blockage





By BruceBlaus. When using this image in external sources it can be cited as:Blausen.com staff (2014). "Medical gallery of Blausen Medical 2014". WikiJournal of Medicine 1 (2). DOI:10.15347/wjm/2014.010. ISSN 2002-4436. - Own work, CC BY 3.0, https://commons.wikimedia.org/w/index.php?curid=28761809



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