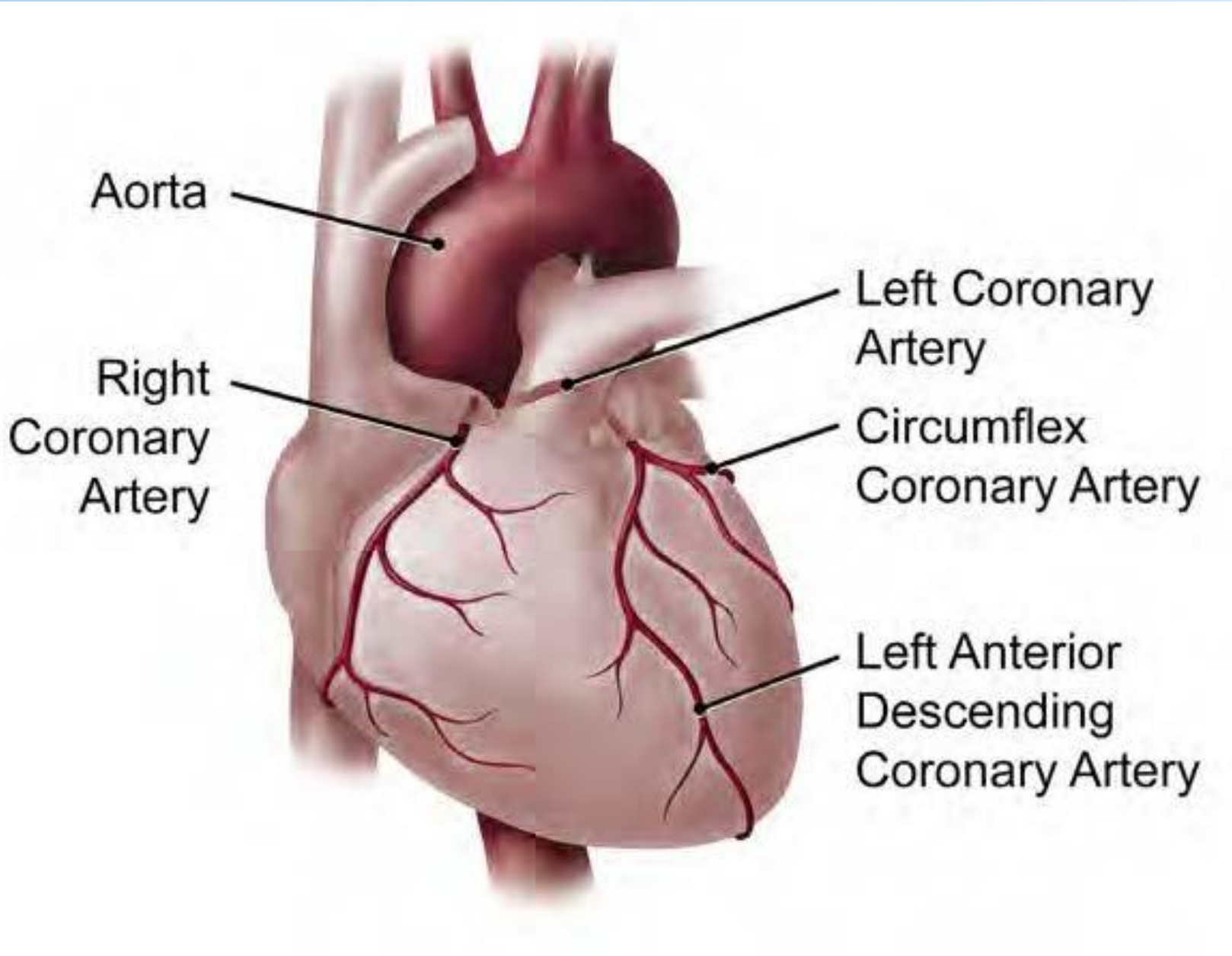


Coronary artery disease Ischemic heart disease

Josefine Holum

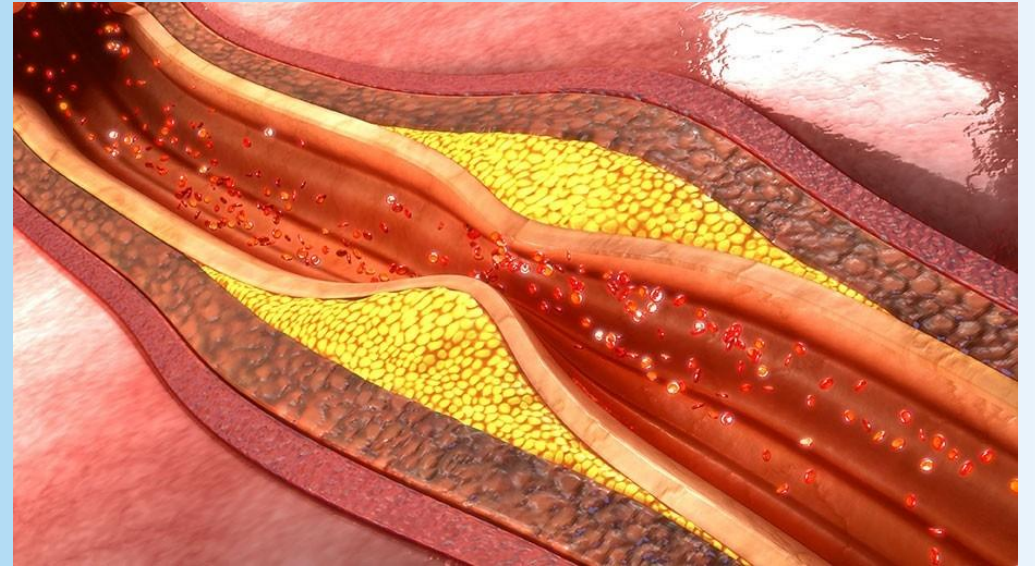
Overview

- Coronary artery disease
 - Heart
 - Atherosclerosis
 - Plaque formation
 - Risk factors
- Ischemic heart disease
 - Angina
 - Acute coronary syndromes
- CASE STUDIES YIPPIIIII



Atherosclerosis

- A disease of elastic arteries and large- and medium sized muscular arteries
- Narrowing and hardening of arteries due to a buildup of cholesterol and lipids



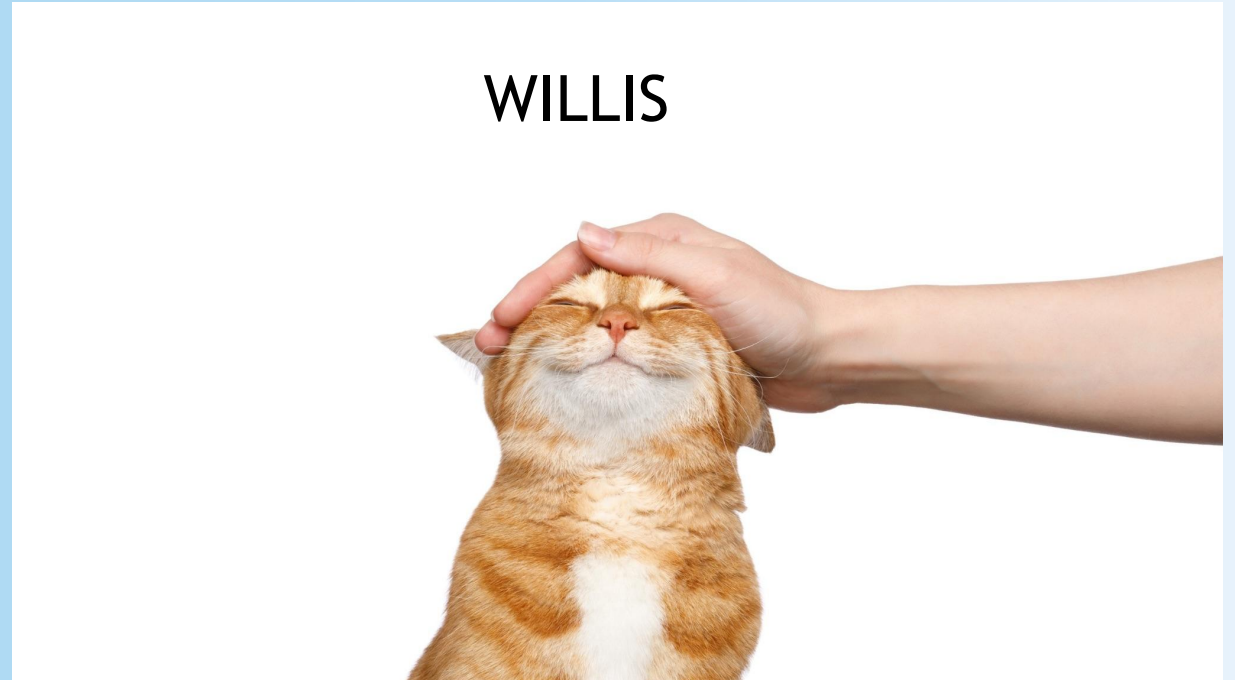
Atherosclerosis

1. Abdominal aorta
2. Coronary arteries
3. Popliteal artery
4. Carotid artery
5. Circle of Willis

Atherosclerosis

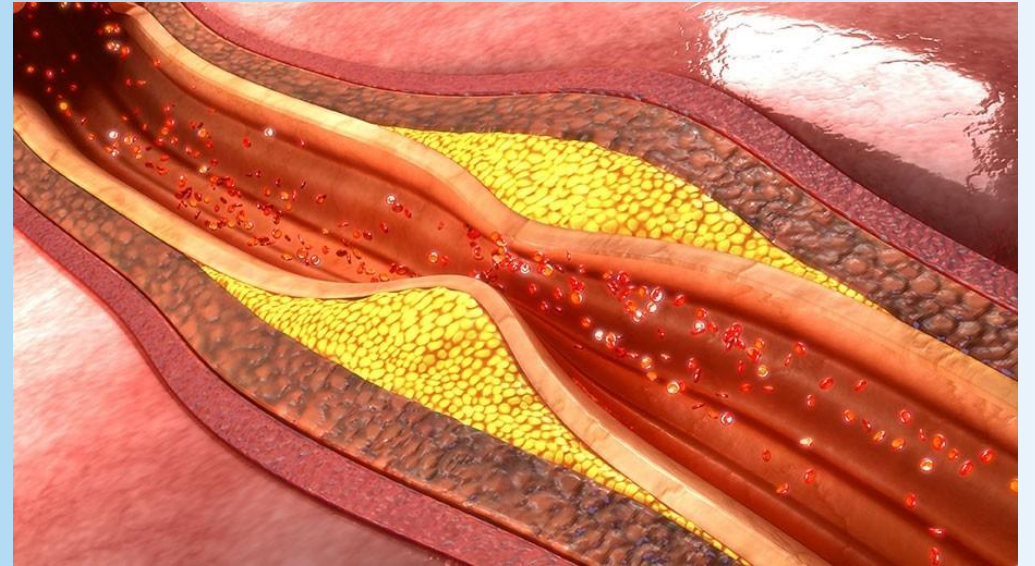
1. **A**bdominal aorta
2. **C**oronary arteries
3. **P**opliteal artery
4. **C**arotid artery
5. Circle of **W**illis

A CoPy Cat named Willis



Atherosclerosis

What if this happens in the heart?



Atherosclerosis

CORONARY ARTERY DISEASE



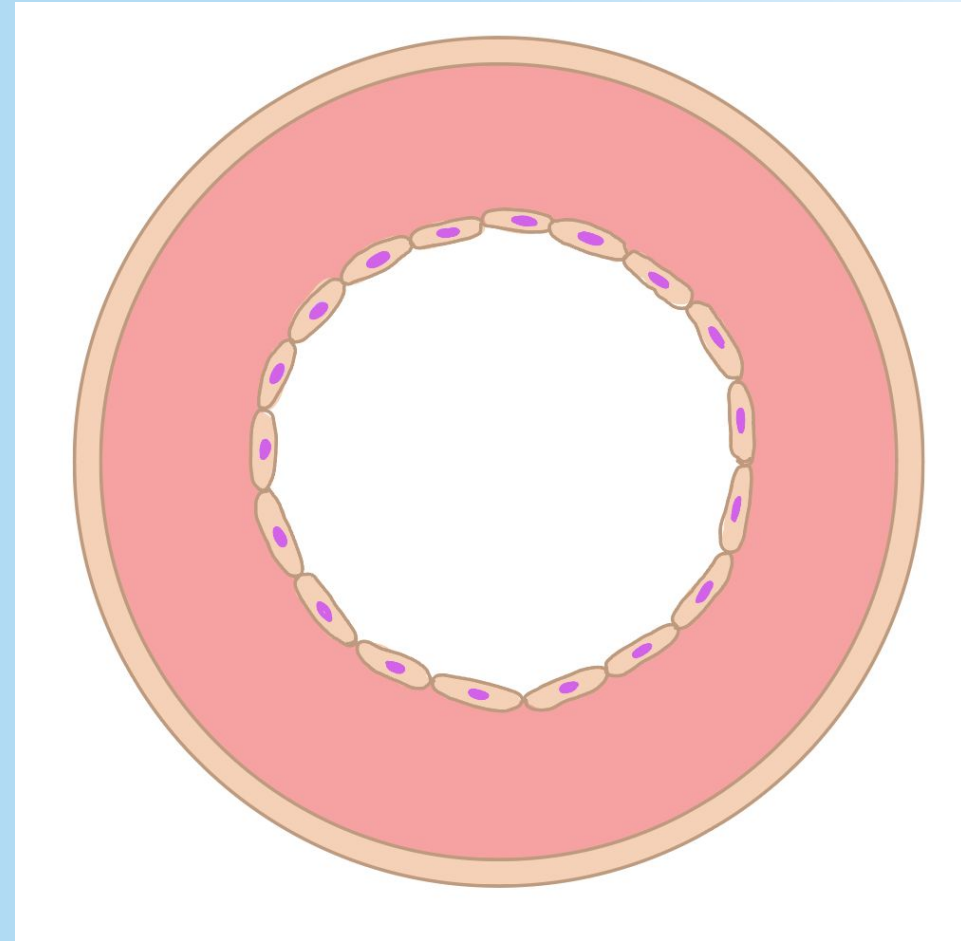
Plaque formation



- Mark
- 23 years old
- MBA student

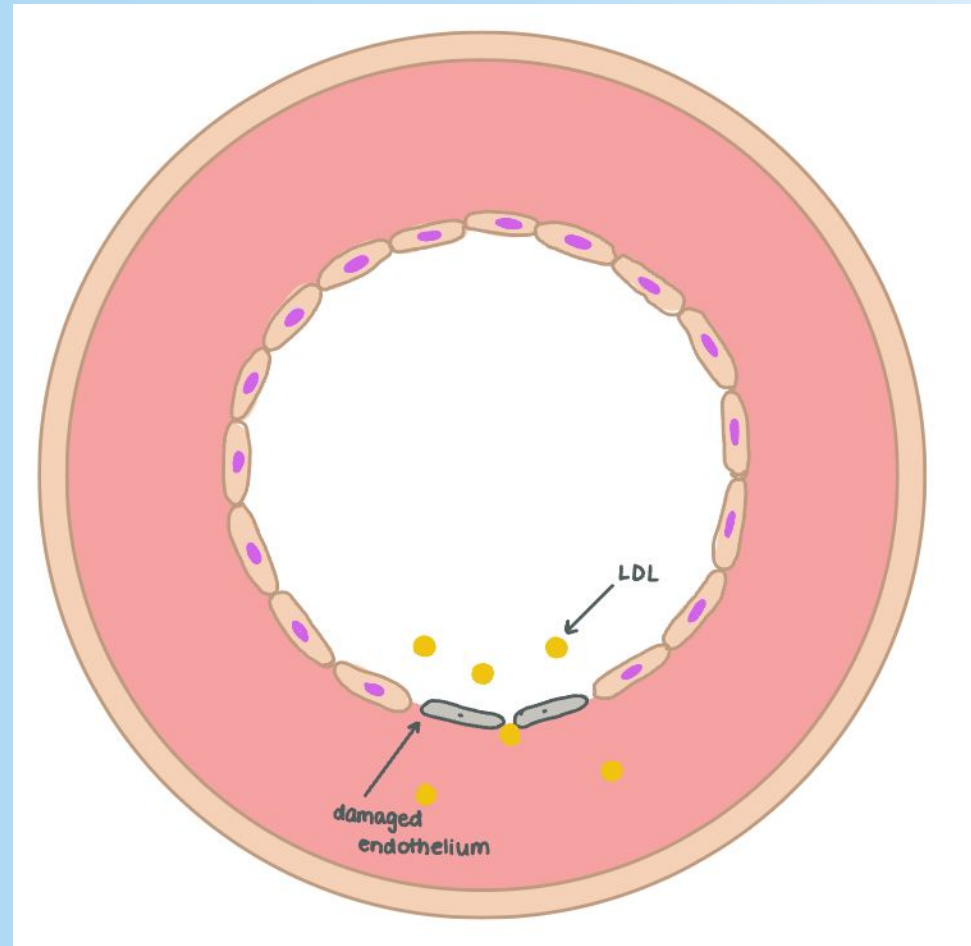
Plaque formation

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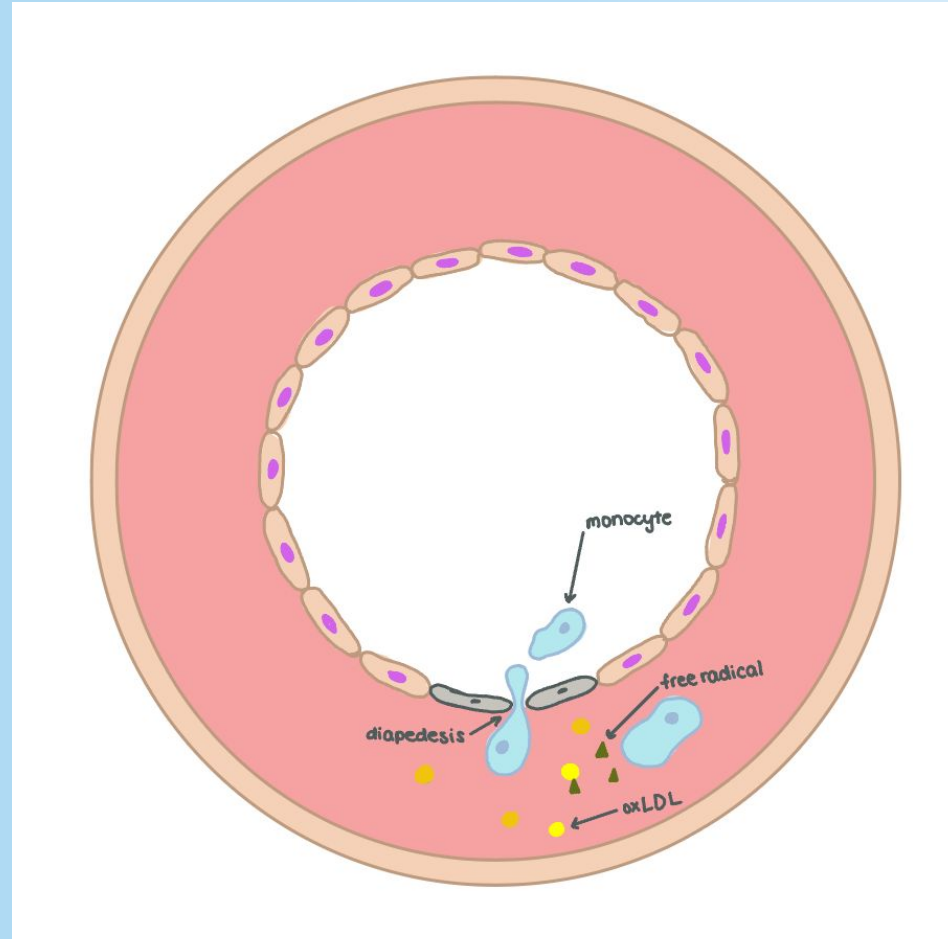


Plaque formation

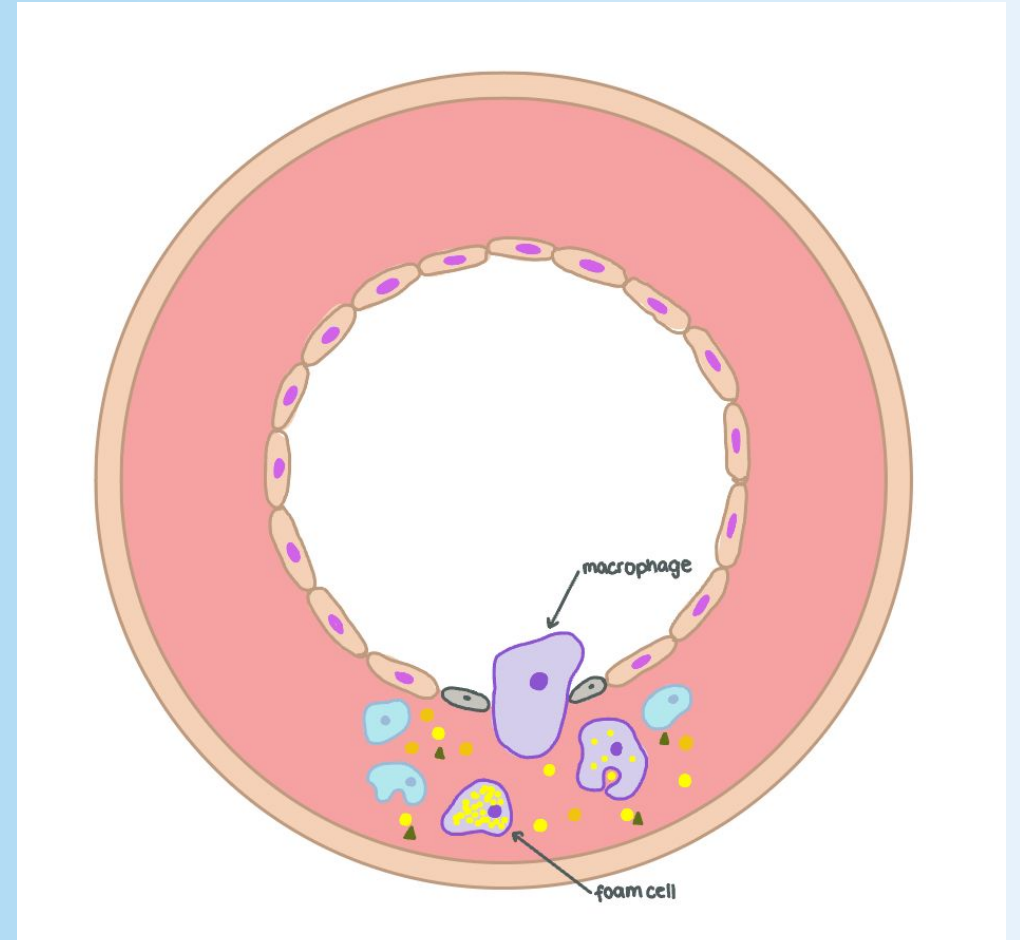


Plaque formation

- Mark
- 45 years old
- His bad habits continue



Plaque formation



Plaque formation

- Mark
- 60 years old



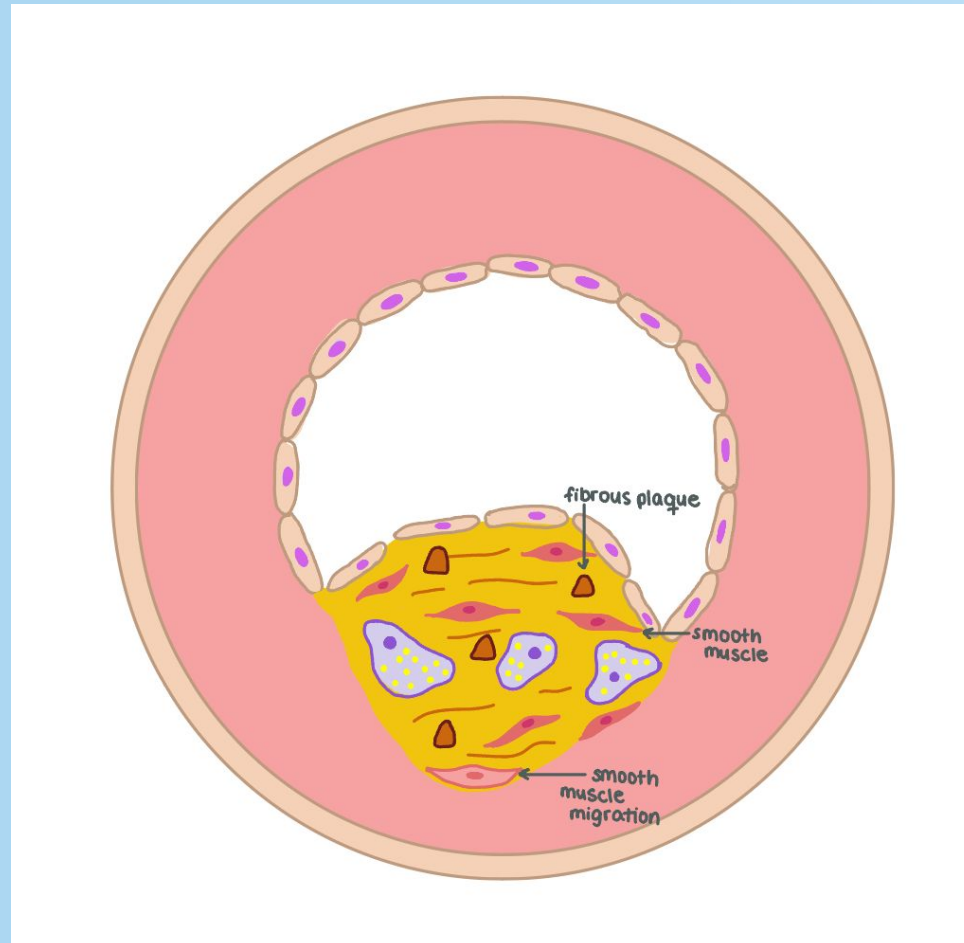
Plaque formation

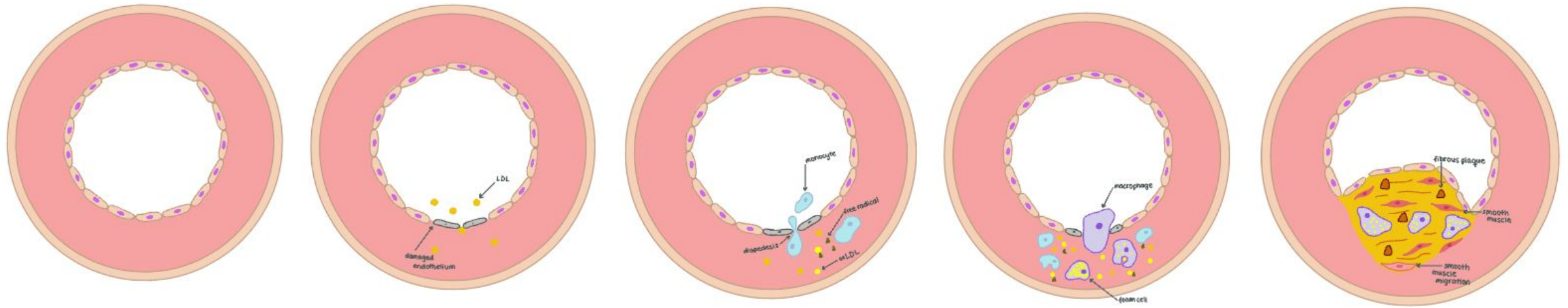
- Mark
- 60 years old

Let us take a look inside his arteries!



Plaque formation





Risk factors

Modifiable

Non-modifiable

Smoking

Hypertension

Diabetes type 2

Hyperlipidemia

Increased LDL

Central obesity

Age

M: >45
F: >55

Gender

M > F

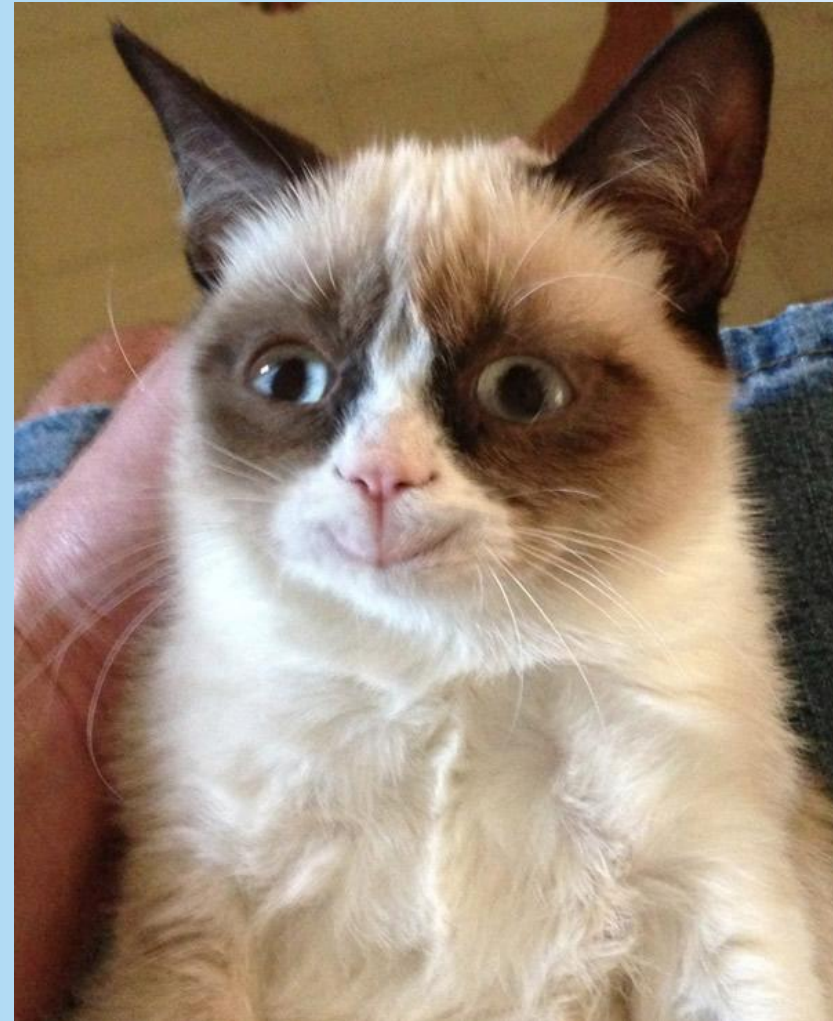
Family History

Ischemia

- Restricted or reduced blood flow
- Ischemic heart disease = restricted blood flow to the coronary arteries
- Most commonly due to atherosclerosis

Stable angina

- Chest pain and discomfort occurring with activity or stress
- Relieved by sublingual nitro
- 70% obstruction



Unstable angina

- Sudden chest pain not triggered by anything, often at rest
- Not relieved by sublingual nitro
- 90% obstruction



Acute coronary syndromes

Acute coronary syndromes

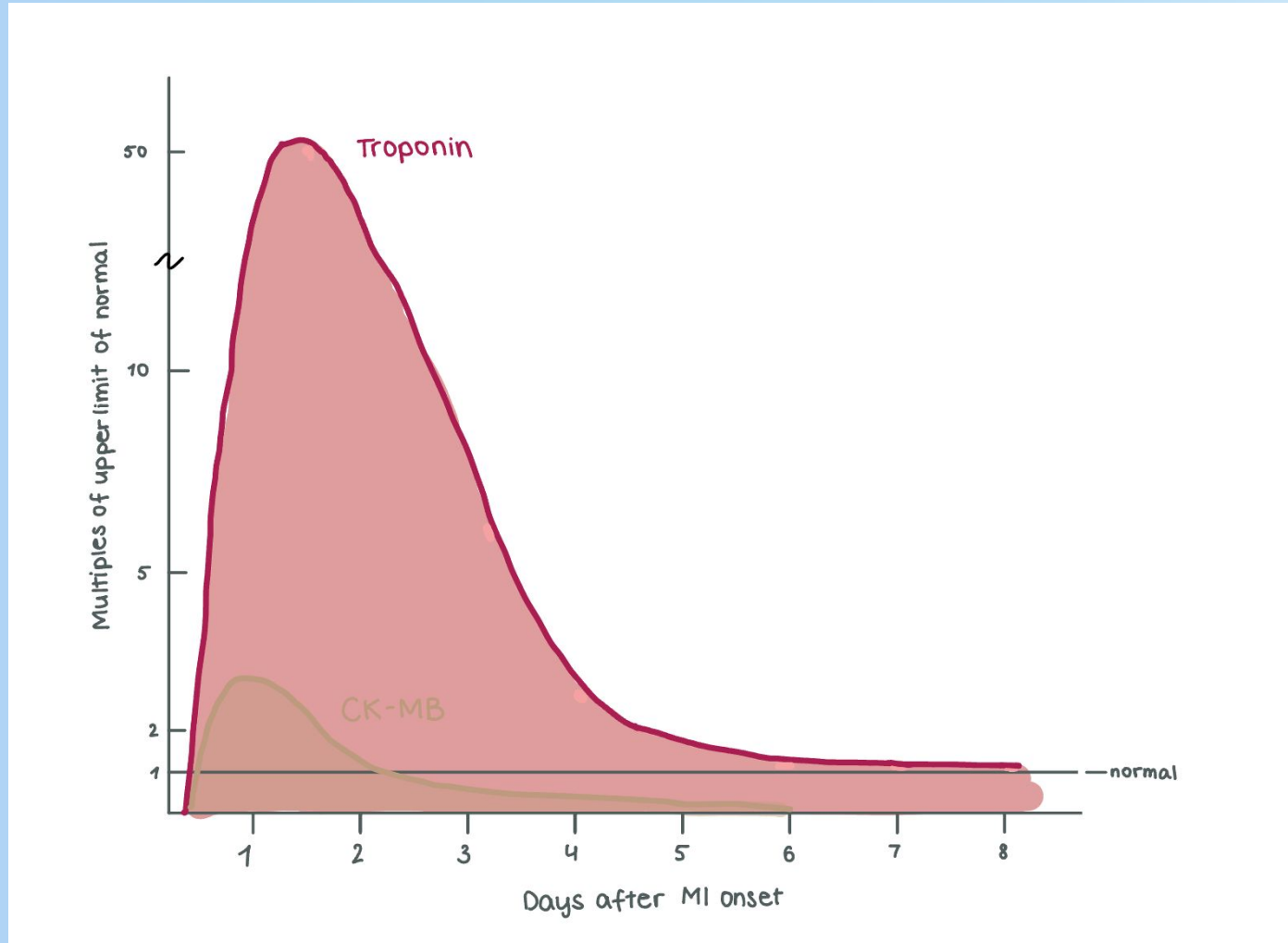
1. Unstable angina
2. NSTEMI
3. STEMI



STEMI and NSTEMI

	NSTEMI	STEMI
PATHOPHYSIOLOGY	<ul style="list-style-type: none">Classically due to partial occlusion of a coronary arteryAffects the inner layer of the heart (subendocardial infarction)	<ul style="list-style-type: none">Classically due to complete occlusion of a coronary arteryAffects the full thickness of the myocardium (transmural infarction)
ECG	No ST-elevation <ul style="list-style-type: none">It can be normal, or nonpecific (ST depression, loss of R waves or T wave inversion)	ST elevation <ul style="list-style-type: none">In 2 contiguous leads
BIOMARKERS	Elevated within 1-6 hours	Elevated within 1-6 hours
TREATMENT	<ul style="list-style-type: none">AnticoagulantsStatinsBeta blockersACEIsPain management	<ul style="list-style-type: none">Immediate revascularizationFibrinolytic therapy

Diagnosis



Treatment

Unstable Angina

- Anticoagulants

NSTEMI

- Anticoagulants
- Statins, beta blockers, ACEIs
- Pain management

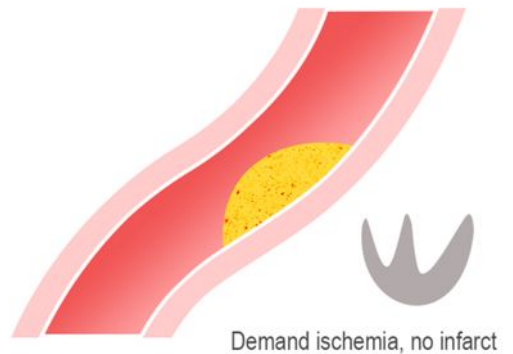
STEMI

- Fibrinolytics, pain management
- Reperfusion therapy

ACUTE CORONARY SYNDROME

1 STABLE ANGINA

Angina pain develops when there is increased demand in the setting of a stable atherosclerotic plaque. The vessel is unable to dilate enough to allow adequate blood flow to meet the myocardial demand.



Normal

Normal

2 UNSTABLE ANGINA

The plaque ruptures and a thrombus forms around the ruptured plaque, causing partial occlusion of the vessel. Angina pain occurs at rest or progresses rapidly over a short period of time.

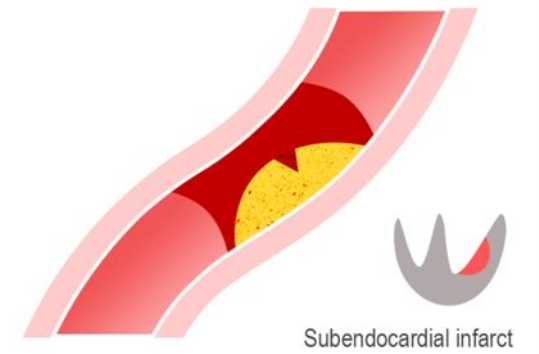


Normal, Inverted T waves, or ST depression

Normal

3 NSTEMI

During an NSTEMI, the plaque rupture and thrombus formation causes partial occlusion to the vessel that results in injury and infarct to the subendocardial myocardium.

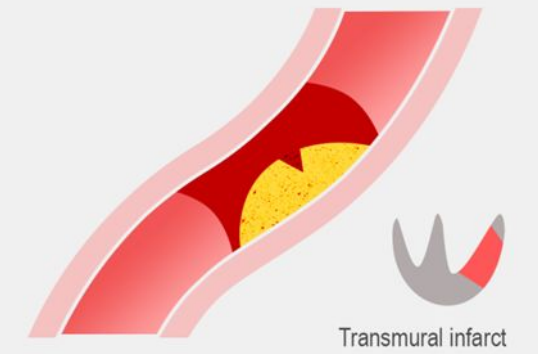


Normal, Inverted T waves, or ST depression

Elevated

4 STEMI

A STEMI is characterized by complete occlusion of the blood vessel lumen, resulting in transmural injury and infarct to the myocardium, which is reflected by ECG changes and a rise in troponins.



Hyperacute T waves or ST elevation

Elevated

ECG

TROPONINS

CASE STUDIES

Mateusz, 54M

- Works as a teacher
- Recurrent chest pain for the past 4 weeks
- Dyspnea and palpitations



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When does the pain occur?

- With exercise or when yelling at my students



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- Works as a teacher
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- Dyspnea and palpitations

When does the pain occur?

- With exercise or when yelling at my students

Medical history: hypertension

Medications: Captopril

Family history: positive for heart problems

Mateusz, 54M

- Works as a teacher
- Recurrent chest pain for the past 4 weeks
- Dyspnea and palpitations

HR: 88

RR: 20

BP: 144/90

When does the pain occur?

- With exercise or when yelling at my students

EKG: normal

Physical exam: normal

Labs: negative

Medical history: hypertension

Medications: Captopril

Family history: positive for heart problems

What is his diagnosis?

- a) Panic attack
- b) Heart attack
- c) Stable angina
- d) Unstable angina



Tadeusz, 70

- Woke up in the middle of the night with a tight feeling in his chest, chest pain
- Lasted for 20 minutes
- The pain was not relieved by sublingual medication
- The pain radiated to his left arm



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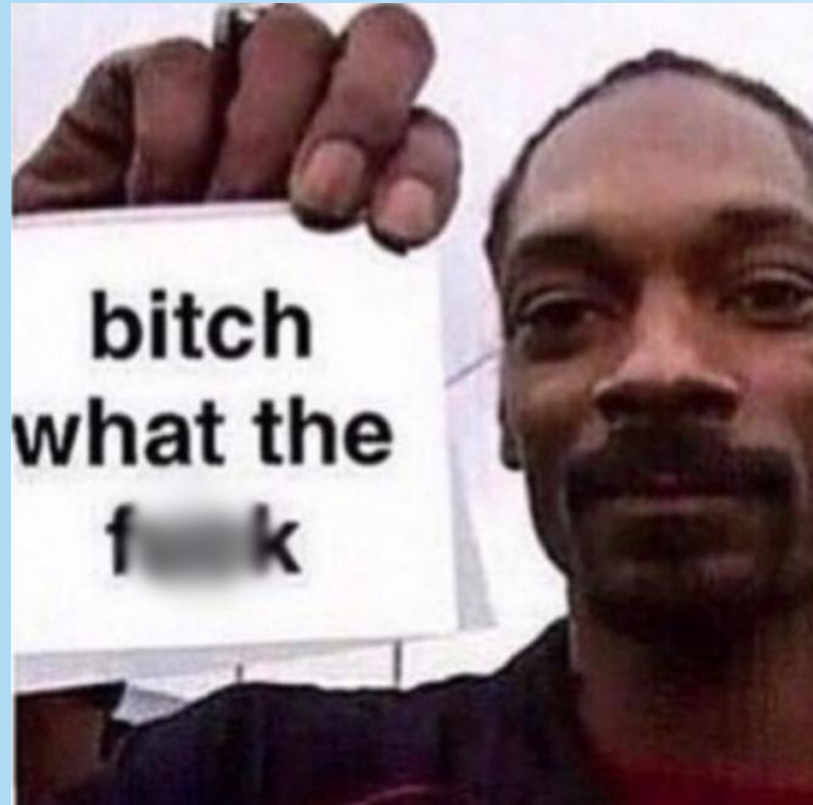
Medical history:

- Pain and dyspnea on exertion for years
- Hypertension and diabetes
- 20 cigarettes a day since he was 18

Tadeusz, 70

HR: 80
RR: 20
BP: 132/78

Physical exam: normal
EKG: normal
Labs: no abnormalities



What is his diagnosis?

- a) Stable angina
- b) Unstable angina
- c) Pulmonary embolism
- d) Myocardial infarction



Mark, 60

- Found in his office by his colleagues with difficulty breathing and drenched in sweat
- Extreme chest pain that radiated to his left arm and jaw
- Wife tells you that he is always working, eats a lot of fast food, smokes to relieve stress and does not exercise



Mark, 60

- Found in his office by his colleagues with difficulty breathing and drenched in sweat
- Extreme chest pain that radiated to his left arm and jaw
- Wife tells you that he is always working, eats a lot of fast food, smokes to relieve stress and does not exercise

HR: 122

RR: 16

BP: 104/69

Labs: Elevated troponins

Mark, 60



Mark, 60

- a) Pulmonary embolism
- b) NSTEMI
- c) STEMI
- d) COPD exacerbation



QUESTIONS?