

**ACUTE CORONARY SYNDROME**  
**Guidelines for diagnosis & Treatment**  
**for Primary Care Physician**

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**YOGYAKARTA**

# **ACUTE CORONARY SYNDROME (ACS)**

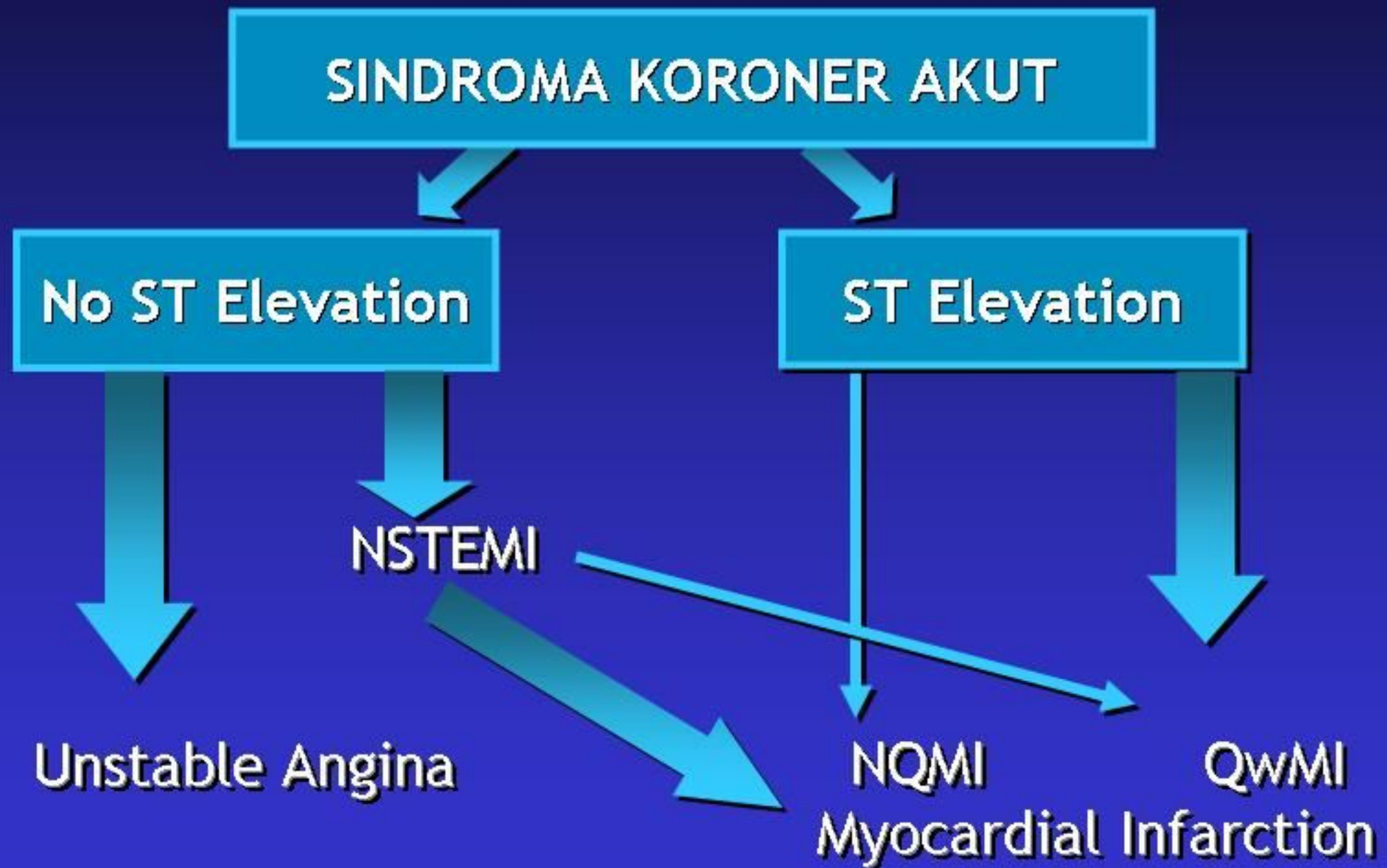
## **SINDROMA KORONER AKUT (SKA)**

- Terminologi operasional untuk suatu simptom klinis akibat terjadinya iskemi miokard akut.
- Terminologi sebelumnya
  - ❏ Acute Coronary Insufficiensi
  - ❏ Intermediate Coronary Syndrome
  - ❏ Slight Coronary Attack
  - ❏ Unstable Coronary Syndrome

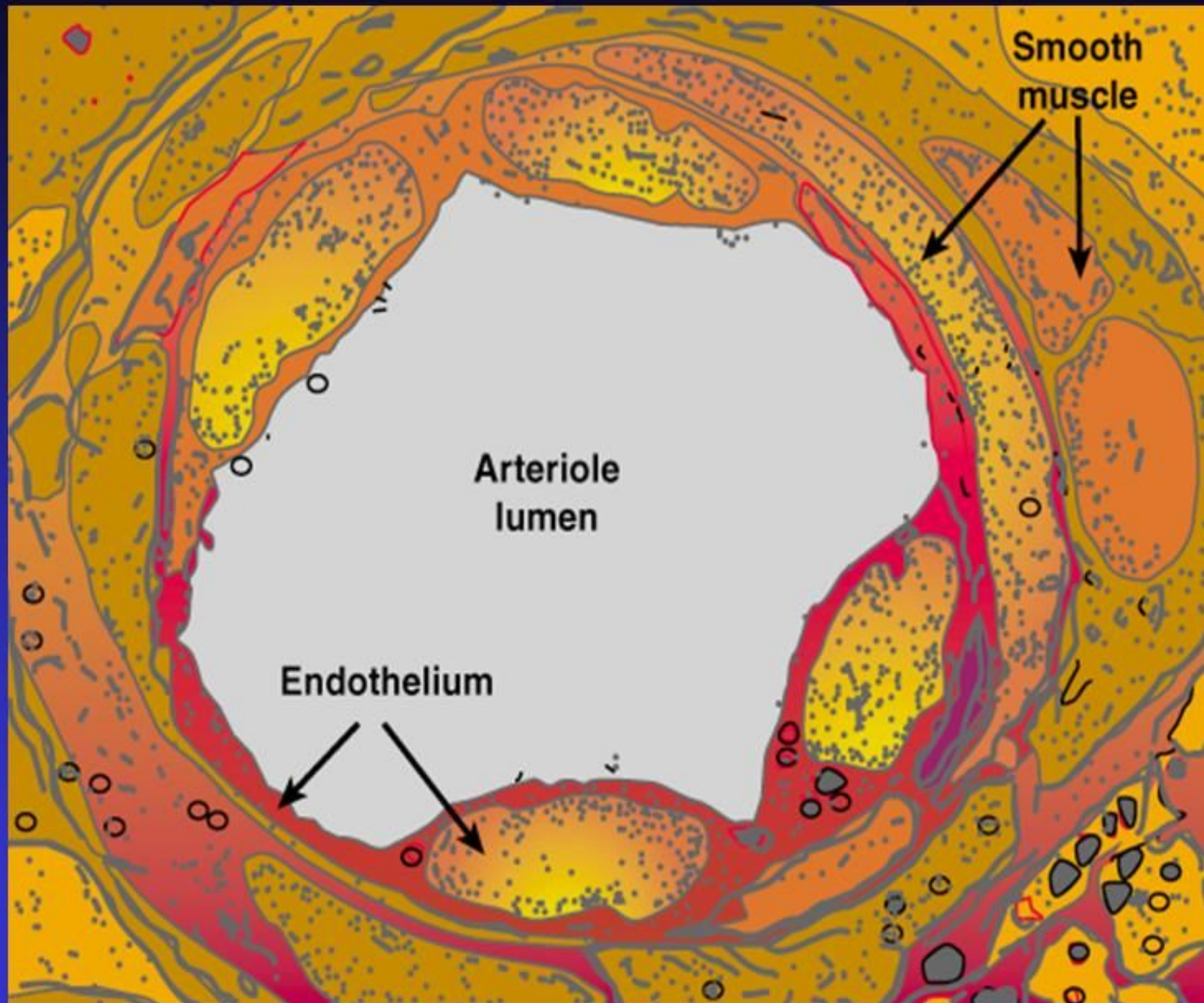
# Insiden



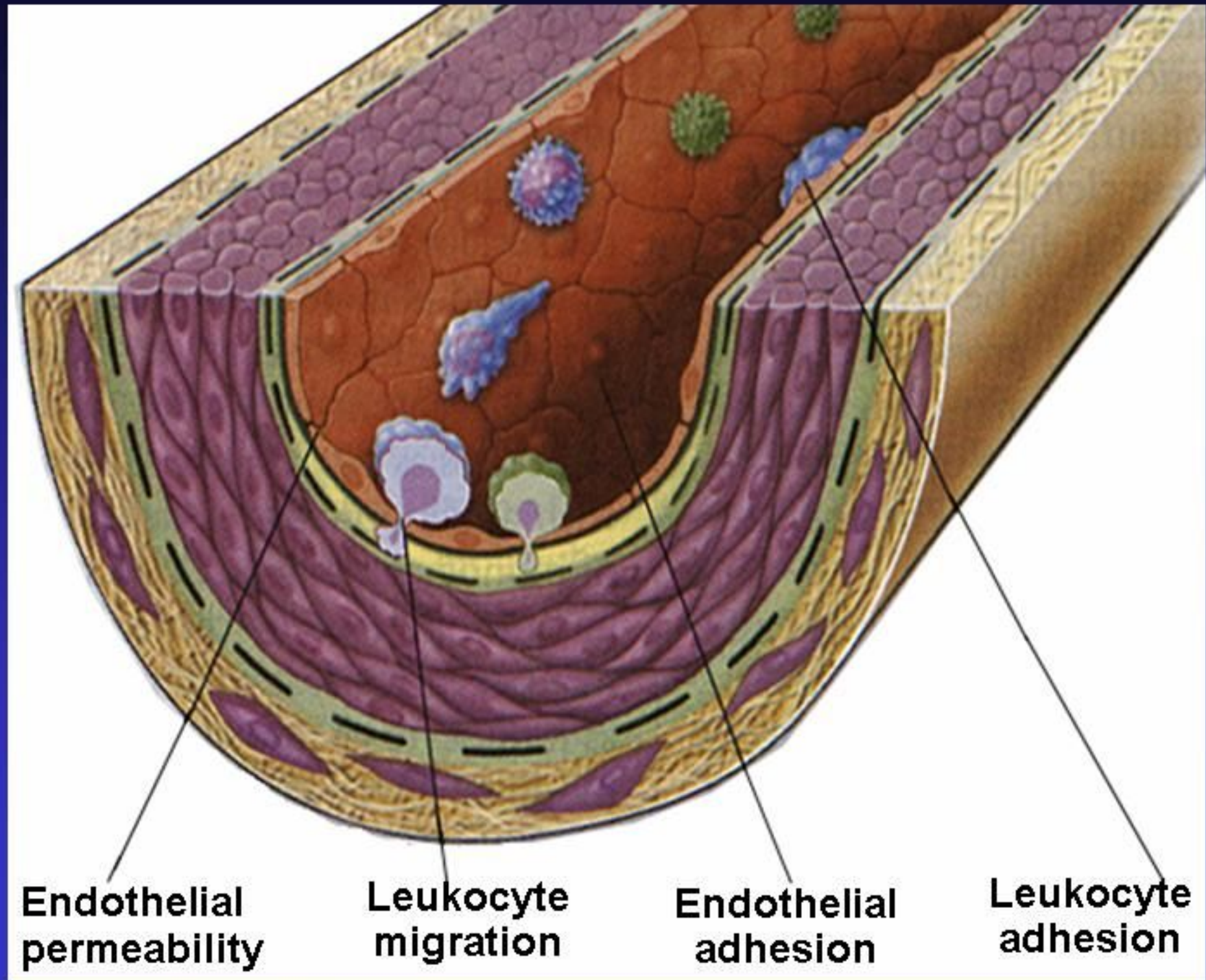
# Nomenclature



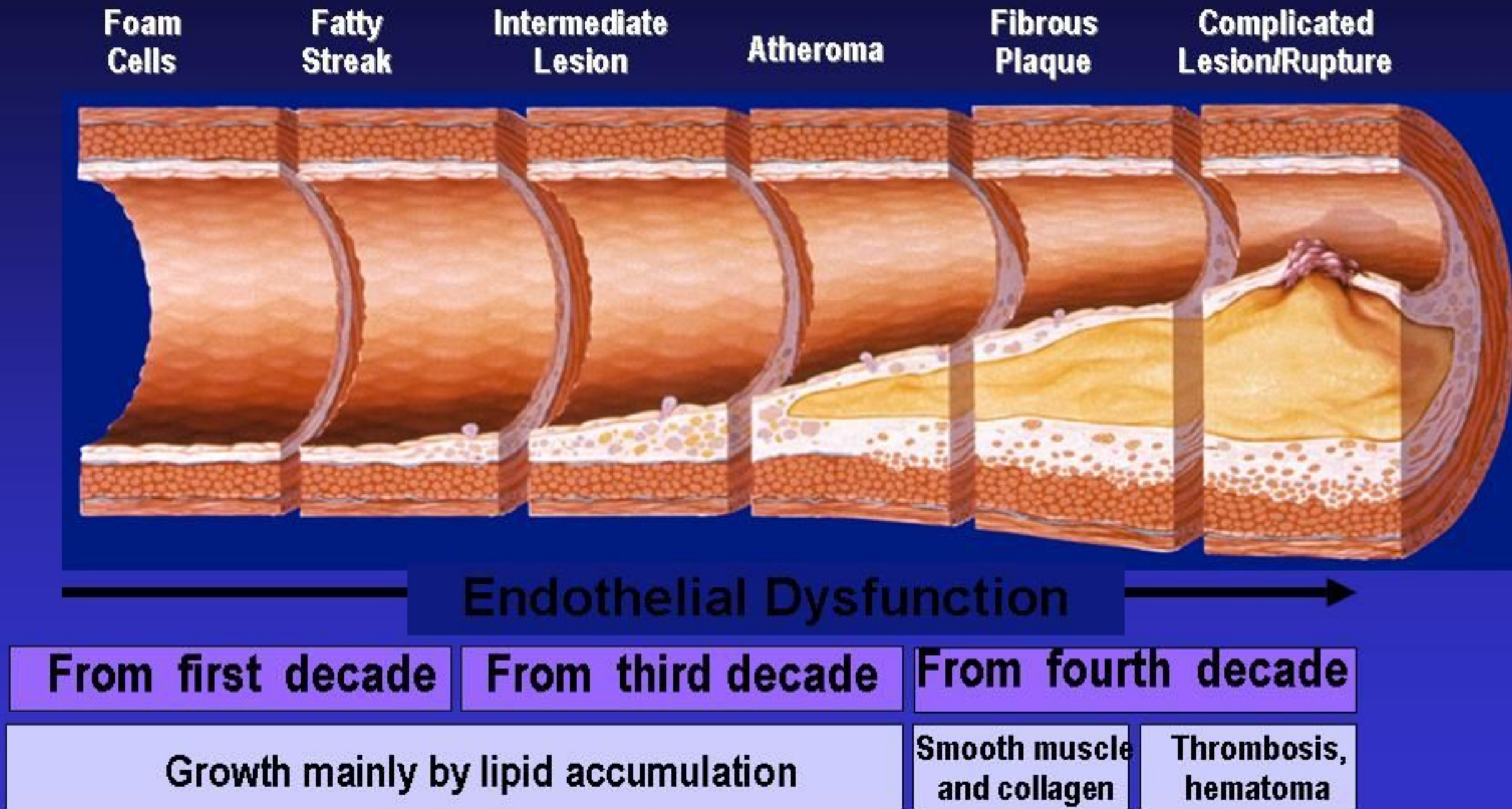
# The Healthy Endothelium



# The Dysfunctional Endothelium

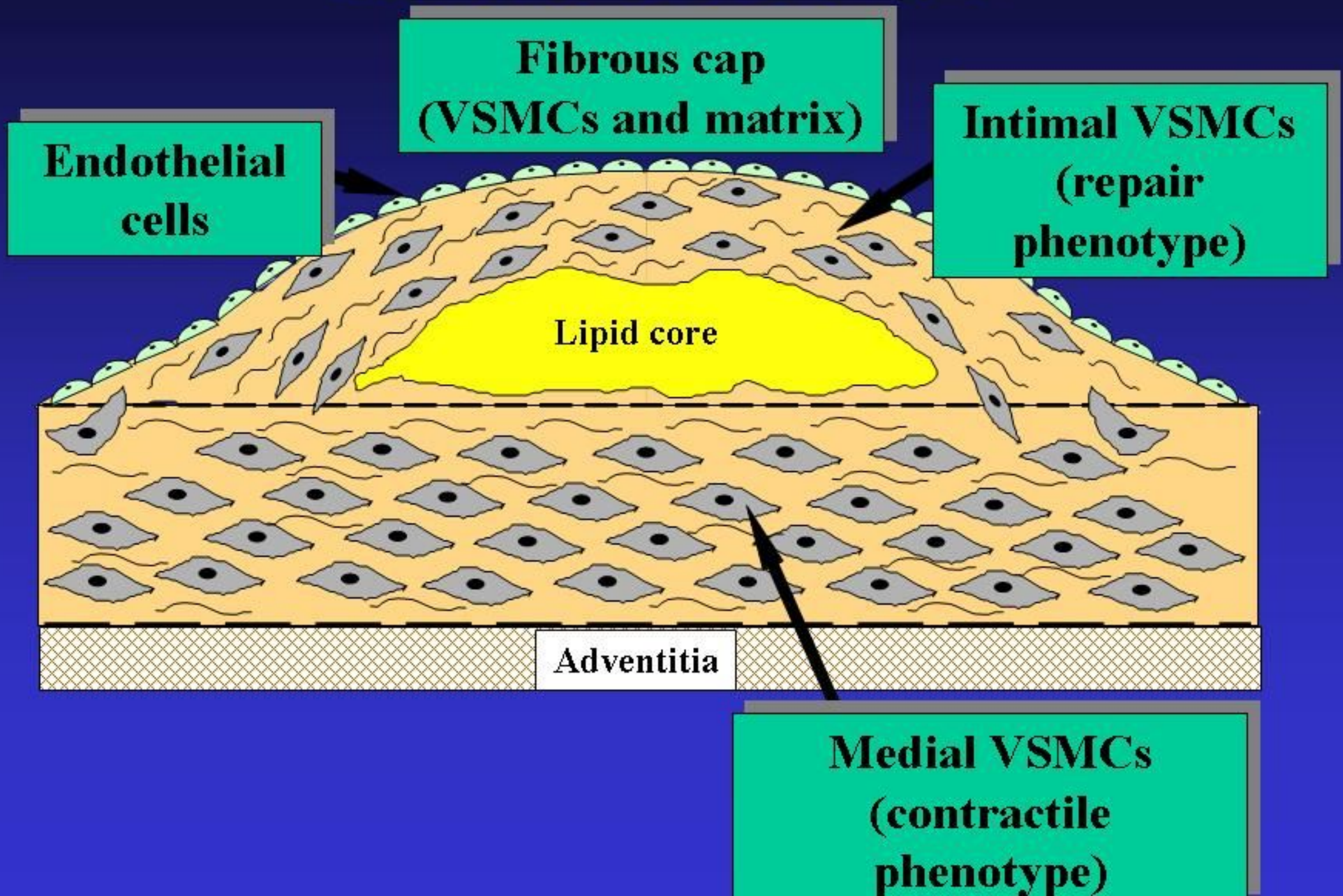


# Atherosclerosis Timeline



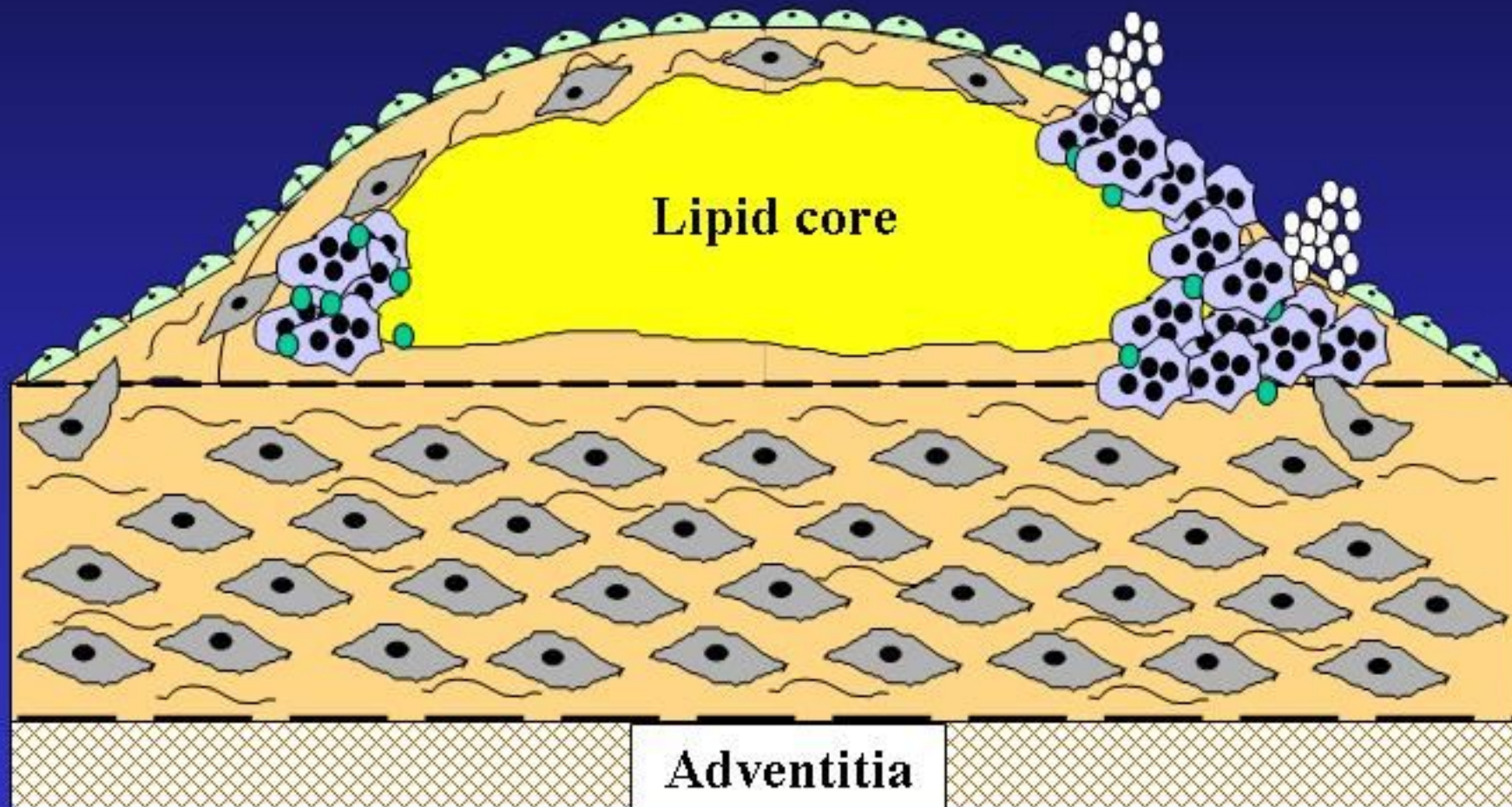
***Stary HC, et al. Circulation. 1995;92:1355-74. Artery wall often gets larger with increasing plaque-Glagov NEJM 1987***

# Characteristics of the stable atherosclerotic

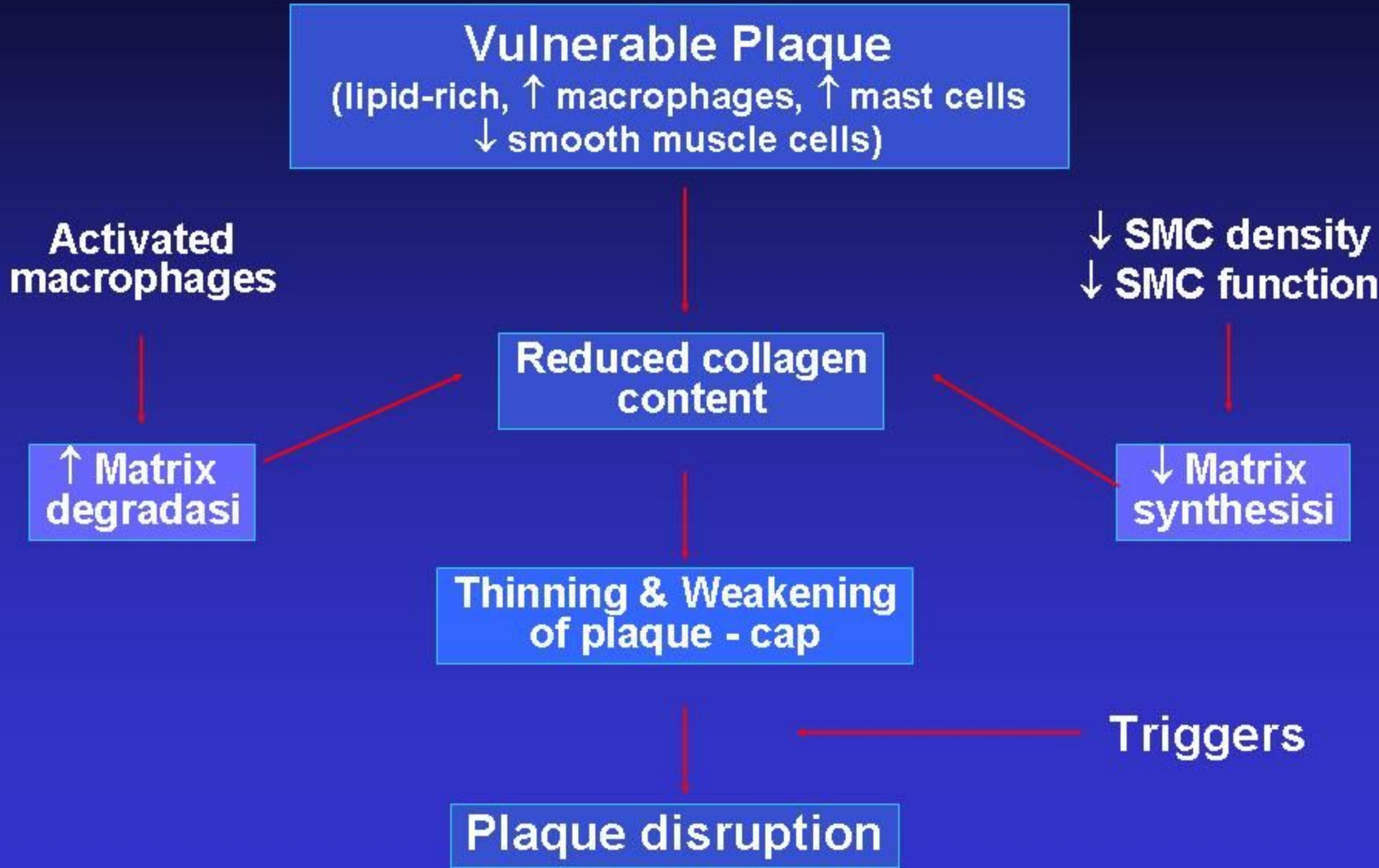




# The vulnerable atherosclerotic plaque



# Patofisiologi Sindroma Koroner Akut



# Nyeri dada iskemia

## Sindroma Koroner Akut

*Presentasi*



*Diagnosis*



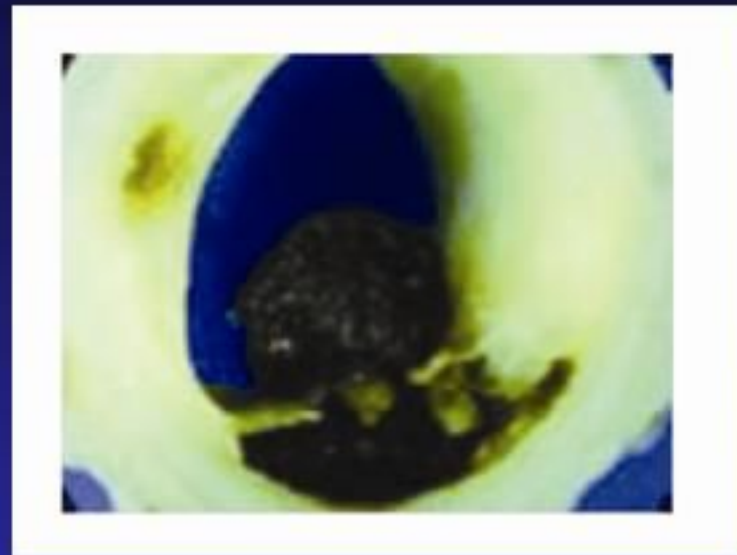
*EKG*



*Enzim Jantung*



*Diagnosis Akhir*



← No ST Elevation →

[ ← Non-ST ACS → ]

**UAP**

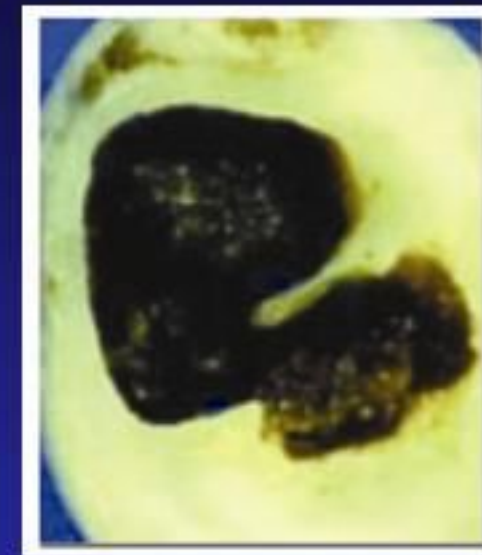


Angina Tidak Stabil

**NSTEMI**



Infark miokardium NQMI



**ST Elevation**



Qw MI

# Evaluasi Awal Pasien SKA

- Anamnesis
- Pemeriksaan fisik
- Elektrokardiogram
- Pemeriksaan enzim

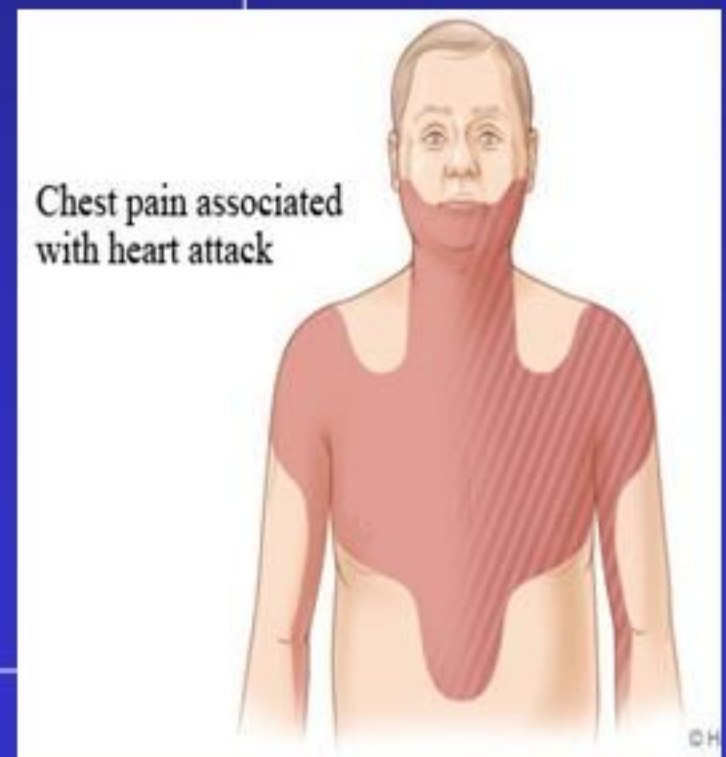
**10 menit!!!**

# Diagnosis SKA

1. Anamnesis:
  - Nyeri dada kardial
  - Faktor Risiko
  - Faktor Pencetus
2. Pemeriksaan Fisik
  - Tanda vital, Aritmia, Hipotensi, Tanda syok, Hipertensi
3. Elektrokardiogram
4. Enzim jantung
5. *Rontgen toraks*
6. *Ekokardiografi*

## NYERI DADA KARDIAL

- ❖ LOKASI DI DADA KIRI/ SUB STERNAL
- ❖ SIFAT:
  - \* SEPERTI DITUSUK/ DIREMAS-REMAS
  - \* ADA BEBAN YANG BERAT/ MENINDIH
  - \* RASA TERBAKAR
  - \* RASA TERCEKIK
  - \* NYERI EPIGASTRIUM
- ❖ ADA PENJALARAN
- ❖ LAMANYA: > 20 MENIT
- ❖ Disertai sesak, mual, muntah, keringat dingin



# Nyeri Dada Non Iskemia

- Nyeri dada pleuritik
- Nyeri dada yang dapat ditunjuk dengan jari
- Nyeri timbul karena pergerakan atau penekanan dada atau lengan
- Nyeri yang sangat singkat (beberapa detik)
- Nyeri yang menjalar sampai ekstremitas bawah

# Penyebab Nyeri Dada Bukan Angina

- Musculoskeletal disorder
- GI disorders ( peptic ulcer )
- Aortic dissection
- Thoracic aneurysm
- Esophageal spasm
- Pneumonia
- Pericarditis
- Neuropsychiatric causes ( eg. Panic disorder )



# UAP/NSTEMI

## Tiga Presentasi Klinis

### Rest Angina

Angina saat istirahat dan berlangsung lama biasanya > 20 menit

### New-onset Angina

Angina berat yang pertama kali timbul setidaknya

### Increasing Angina

Telah diketahui angina, namun nyeri dirasakan makin sering, makin lama, dan timbul dengan aktivitas yang lebih ringan

# Pemeriksaan Fisik

- Faktor pencetus iskemia miokardium
- Tanda vital dan kardiovaskular
- Biasanya normal
- Tanda gagal jantung atau syok kardiogenik
- Komplikasi infark miokardium (*Ventricle Septal Ruptur, Acute Mitral Regurgitation*)
- Klasifikasi Killip → risiko mortalitas

# ELEKTROKARDIOGRAFI

**10 MENIT!!!**

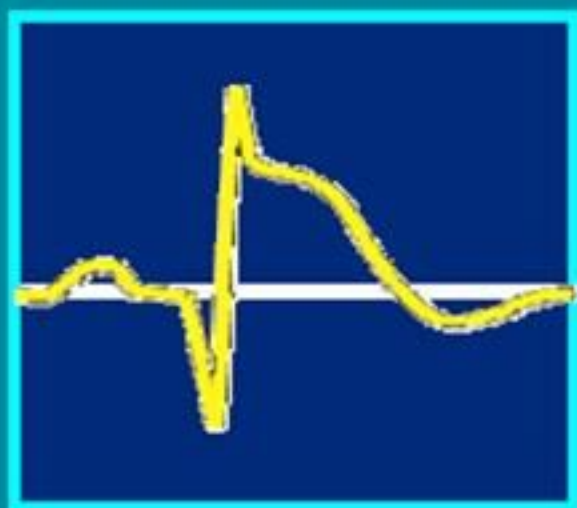
## **STEMI**

1. **ST ELEVASI** dengan gambaran evolusi
  - **$\geq 1$  mVOLT DARI 2 SADAPAN LEAD II,III,aVF dan I aVL**
  - **$\geq 2$  mV di lead V1-V6**
2. **LBBB BARU**

## **NON STEMI**

Depresi ST  $\geq 0,1$ mV, inversi gelombang T  $>0,2$ mv yang simetris dari 2 lead yg bersebelahan

## ACS with persistent ST-segment elevation



## ACS without persistent ST-segment elevation

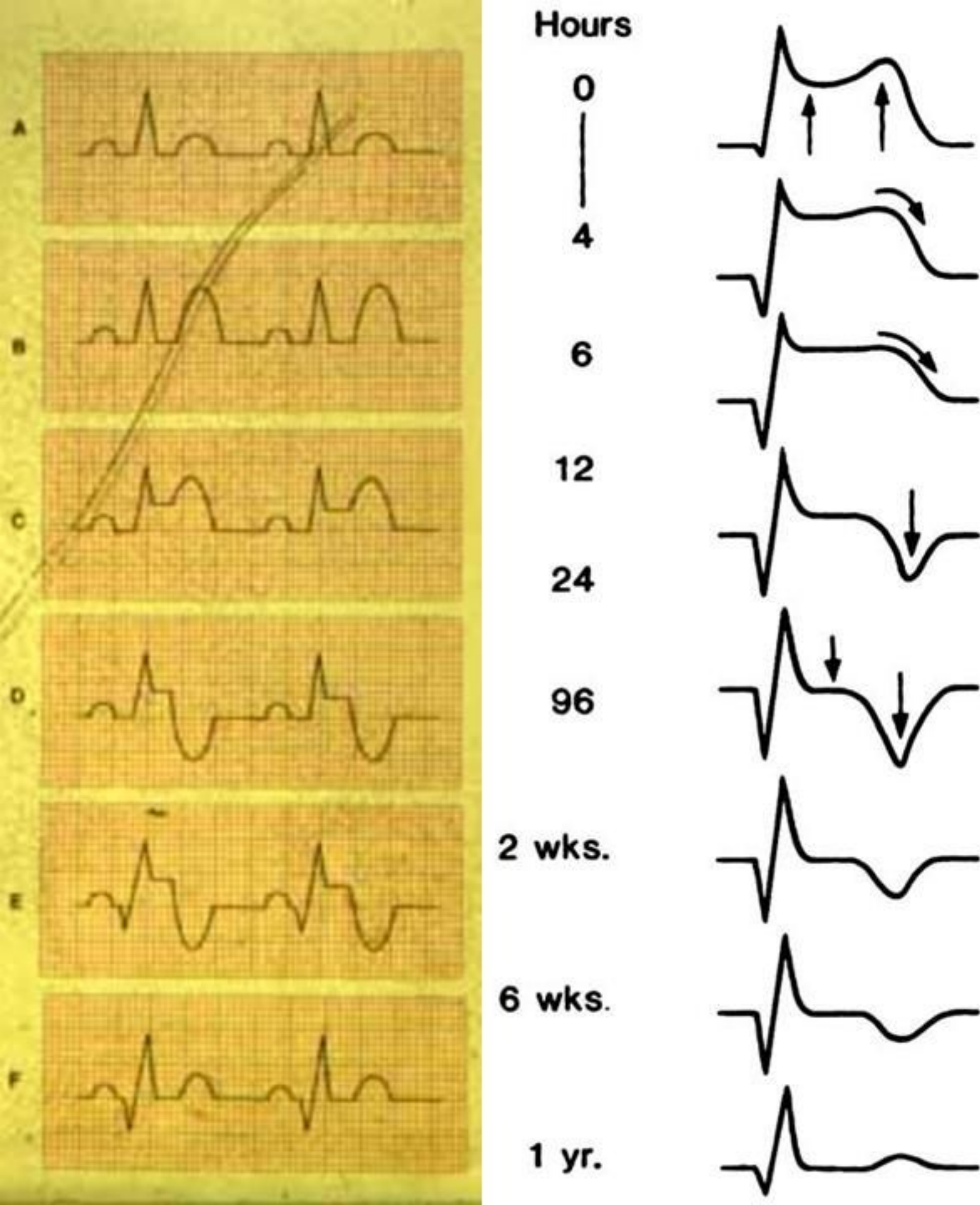


Troponin ↑ or CK-MB

Troponin elevated or not

Myocardial infarction

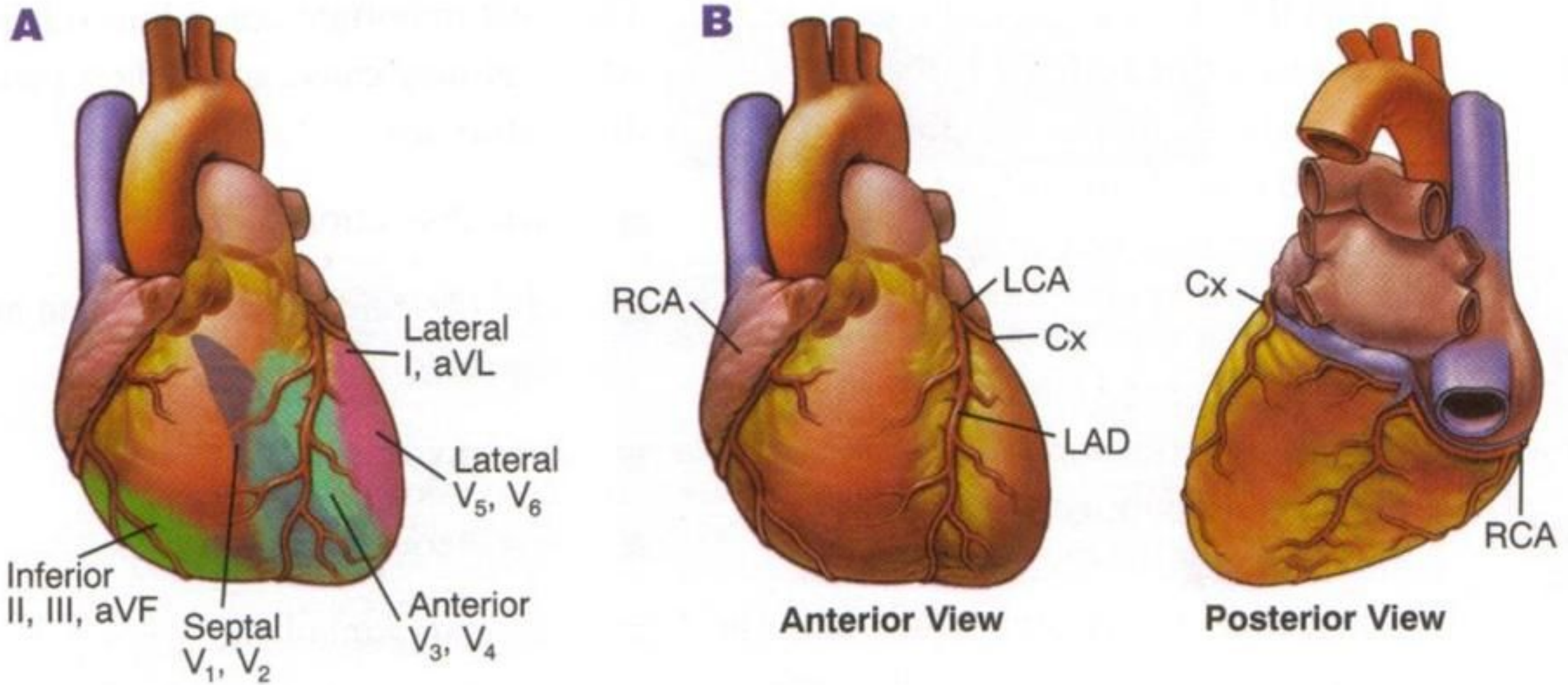
Unstable angina

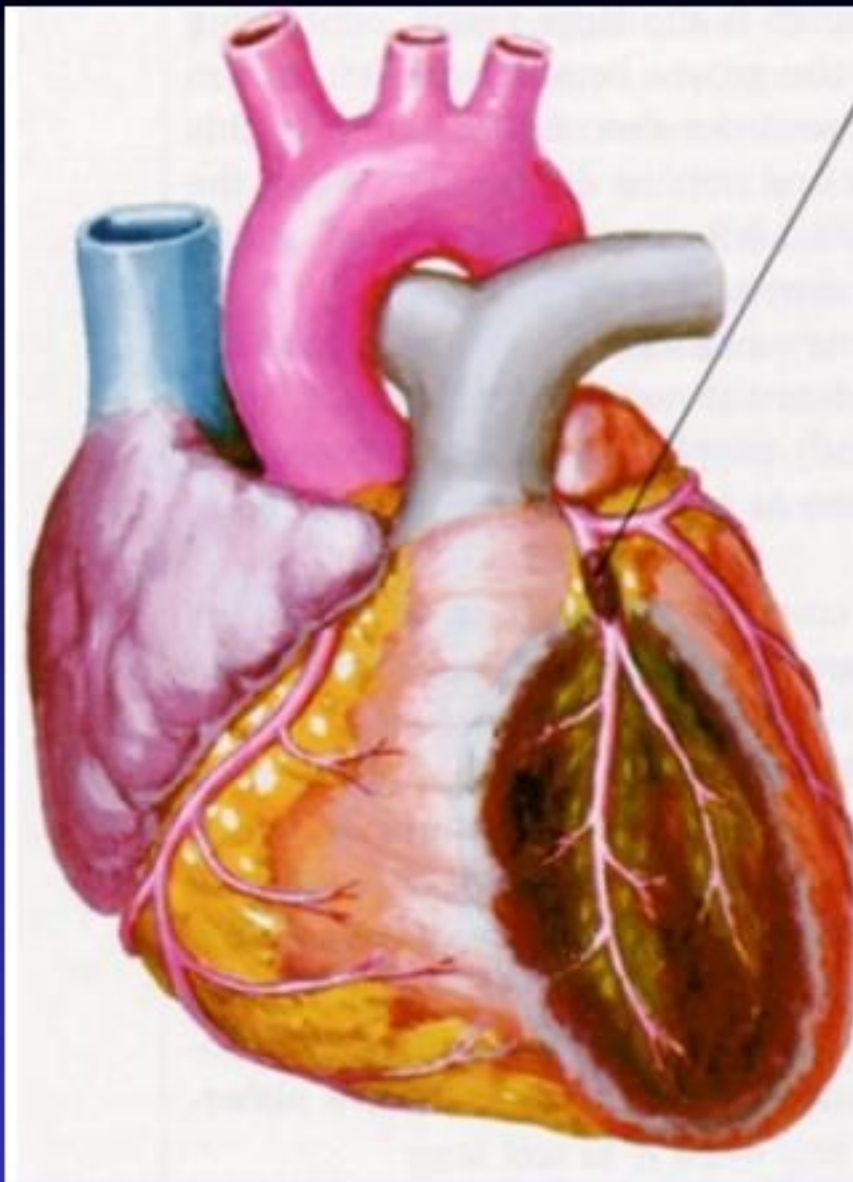


## Evolusi EKG

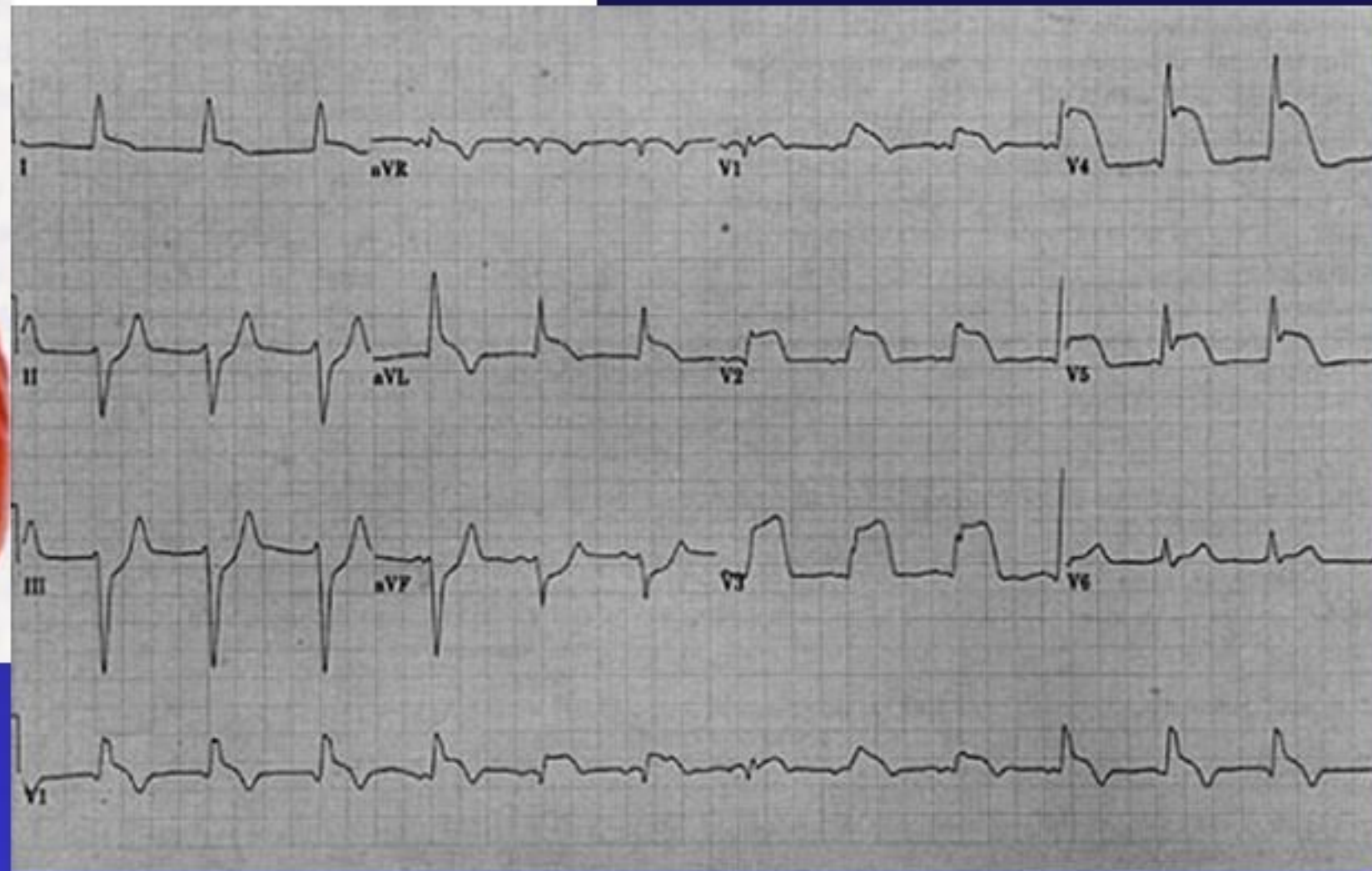
- A. Normal ECG
- B. 'Tall T
- C. 'Injury', ST elevation
- D. Biphasic T waves
- E. Q - Biphasic T waves
- F. Q - abnormal

# Sadapan EKG dan Lokasi Infark





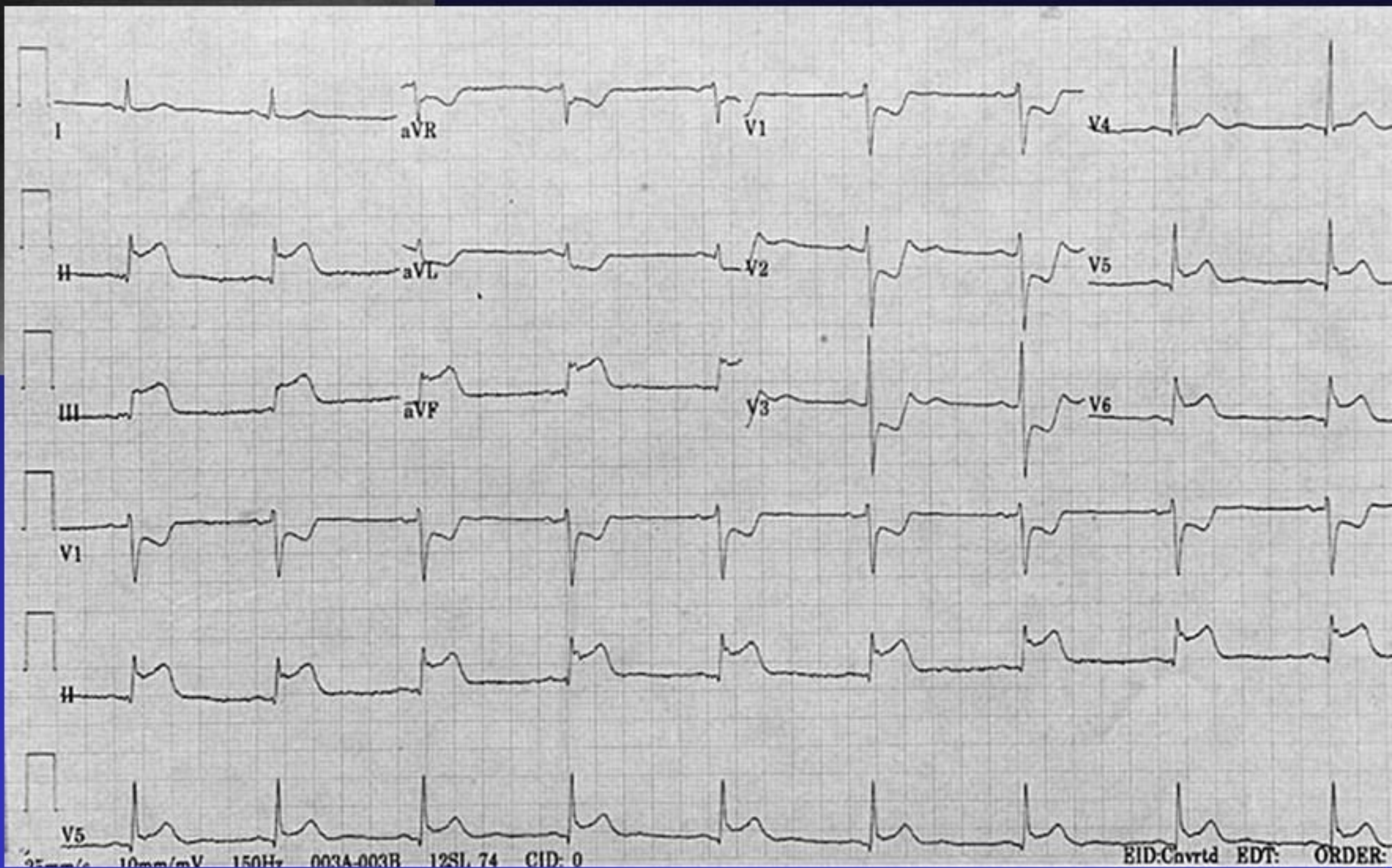
Occlusion of proximal left anterior descending coronary artery



ECG demonstrates large anterior infarction



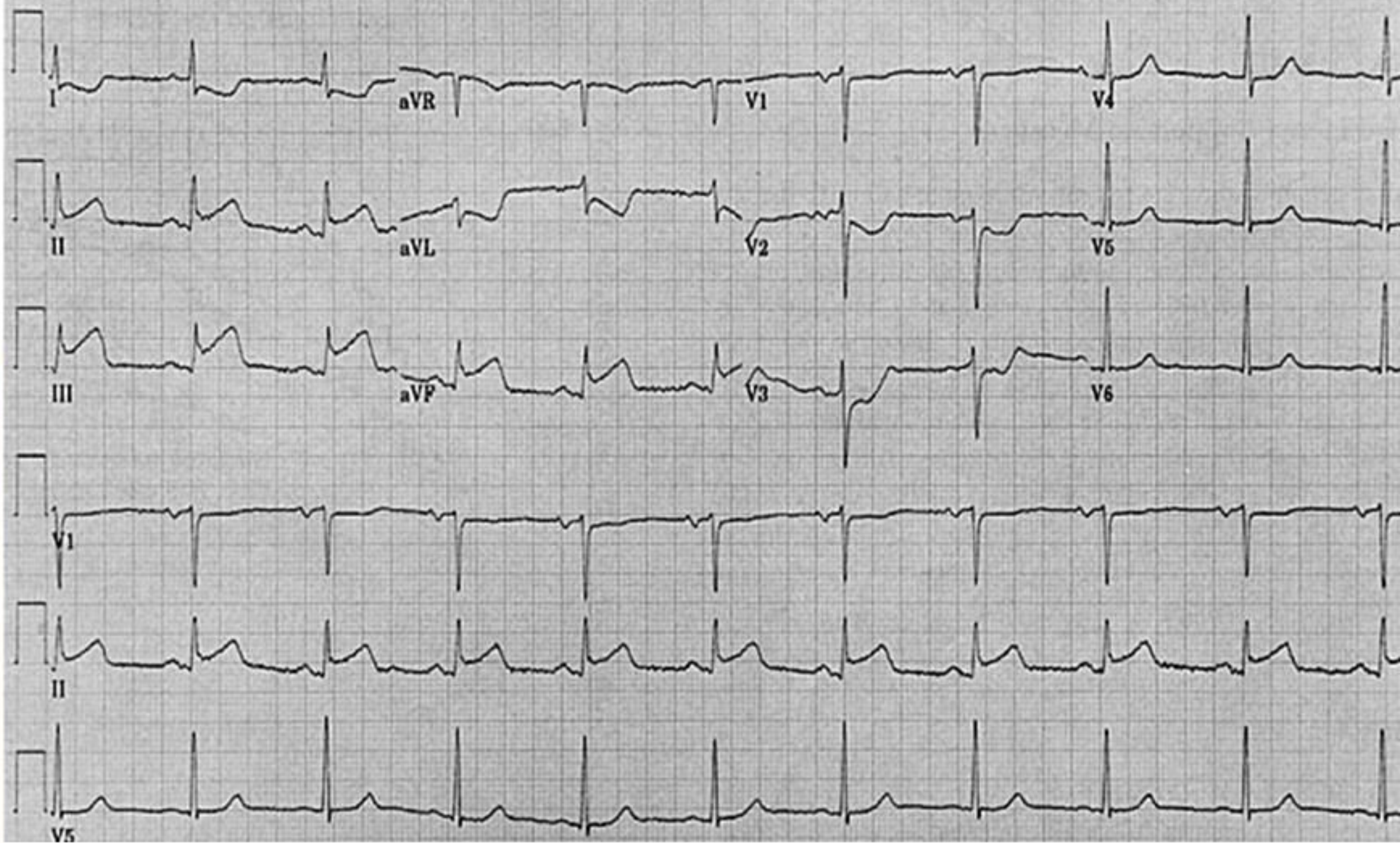
**A:** Proximal large RCA occlusion



**STEMI Inferior dan lateral dengan iskemia di anterior**



**A : Small inferior distal RCA occlusion**

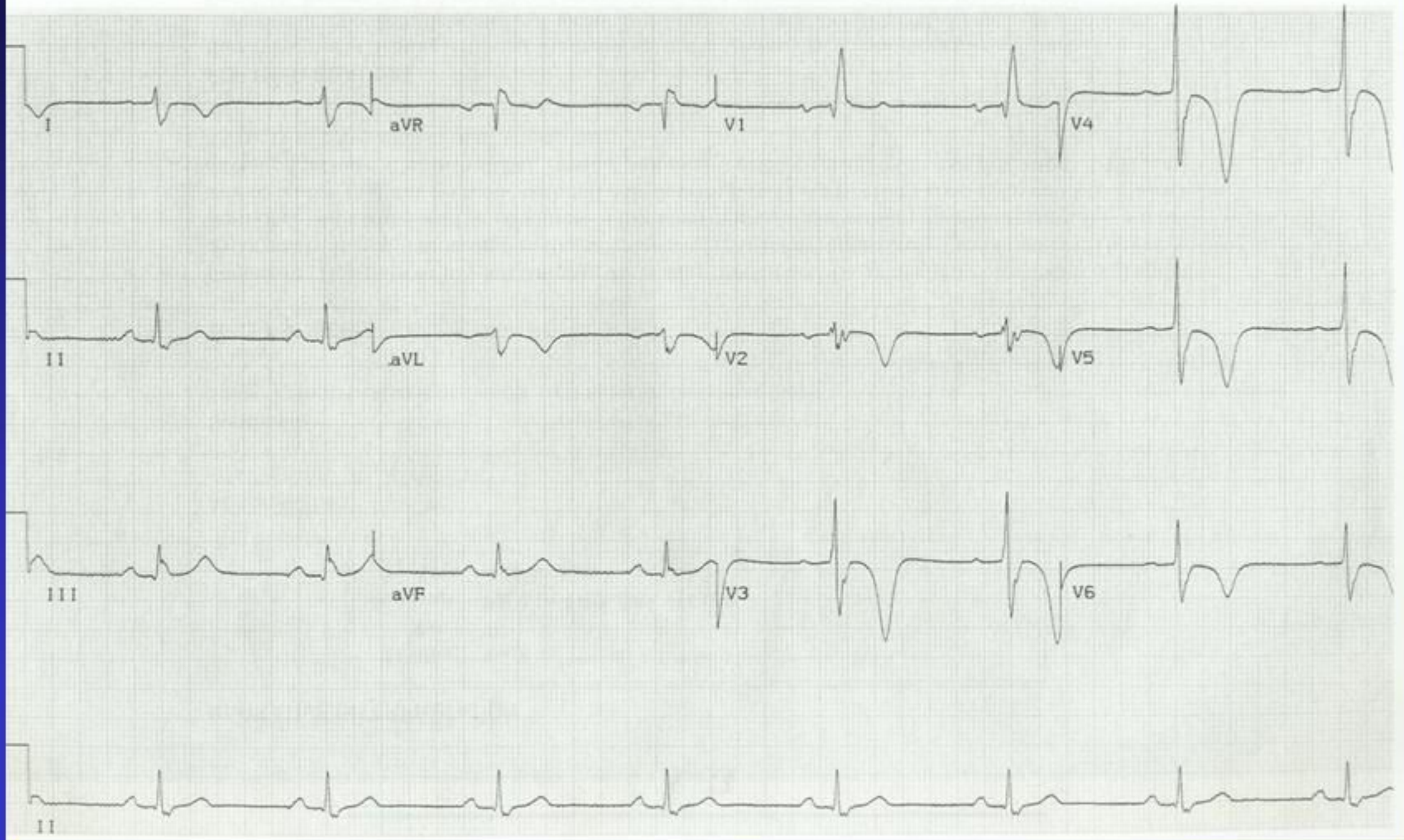


**STEMI Inferior**

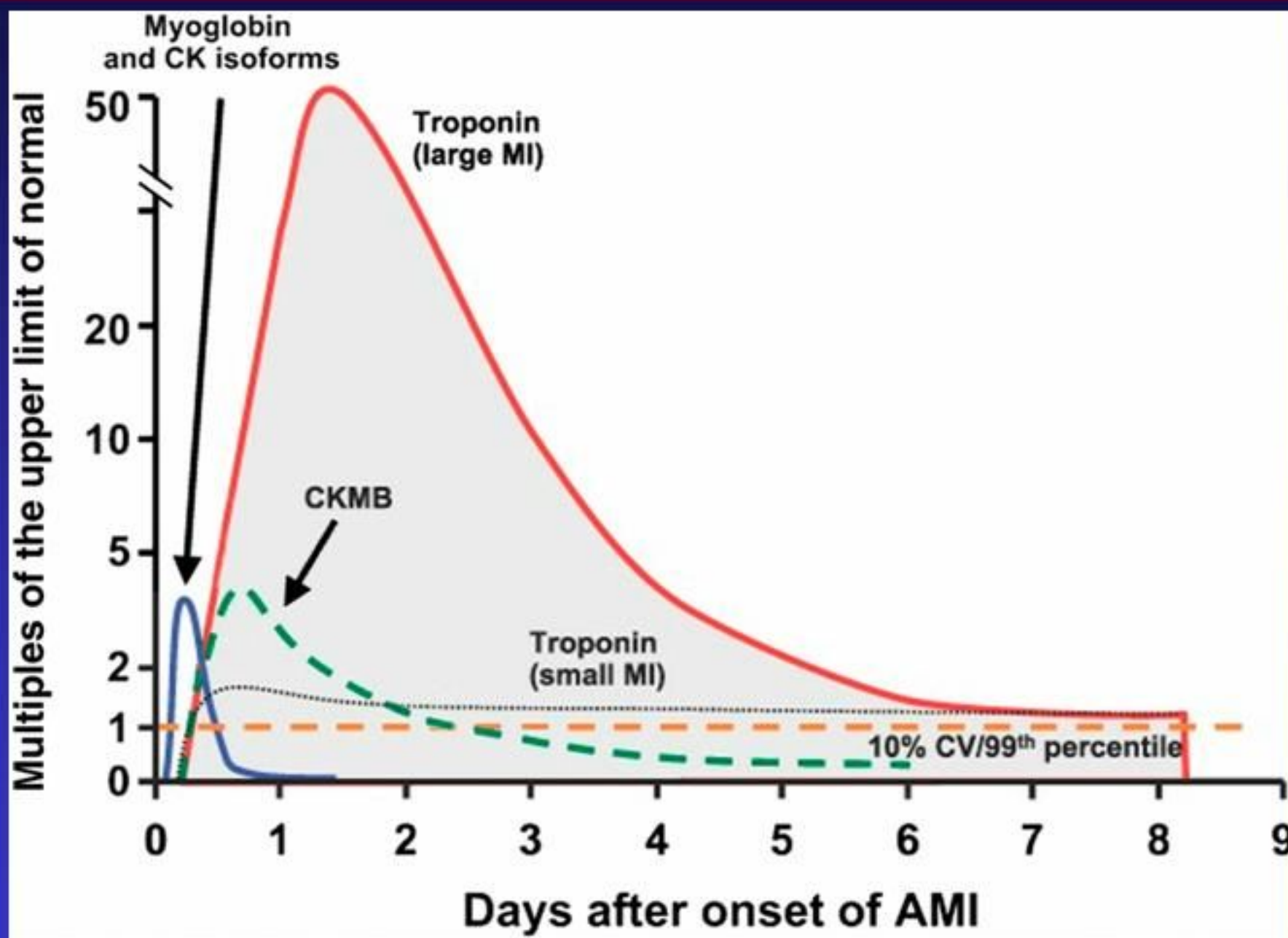
# UAP/NSTEMI

## Clinical History

A 74-year-old man admitted to the CCU who has developed chest discomfort.



# Waktu Pelepasan Enzim Jantung



Shapiro BP, Jaffe AS. Cardiac biomarkers. In: Murphy JG, Lloyd MA, editors. Mayo Clinic Cardiology: Concise Textbook. 3<sup>rd</sup> ed. Rochester, MN: Mayo Clinic Scientific Press and New York: Informa Healthcare USA, 2007:773-80.

Anderson JL, et al. *J Am Coll Cardiol* 2007;50:e1-e157, Figure 5.

## ENZYM KARDIAL

ENZYM	MENINGKAT	PUNCAK	NORMAL
CKMB	3-4 JAM	12-24 JAM	36 - 48 JAM
Mioglobin	2 JAM	6 JAM	24 JAM
TROPONIN T / I	4-6 JAM	24 JAM	10 - 14 HARI

*Troponin paling sensitif untuk melihat adanya kerusakan otot jantung*

# KRITERIA DIAGNOSIS

## INFARK MIOKARD AKUT (IMA)

- NYERI DADA KIRI KHAS KARDIAL
- PERUBAHAN EKG
- KENAIKAN ENZYM KARDIAL

→ BILA ADA 2 DARI 3 HAL TERSEBUT DIATAS



IMA

# Reperfusi



**Farmakologi**



**Trombholitic  
/ Fibrinolytic**

**Invasif**

**PTCA (non bedah)**

**CABG (bedah)**

# PTCA

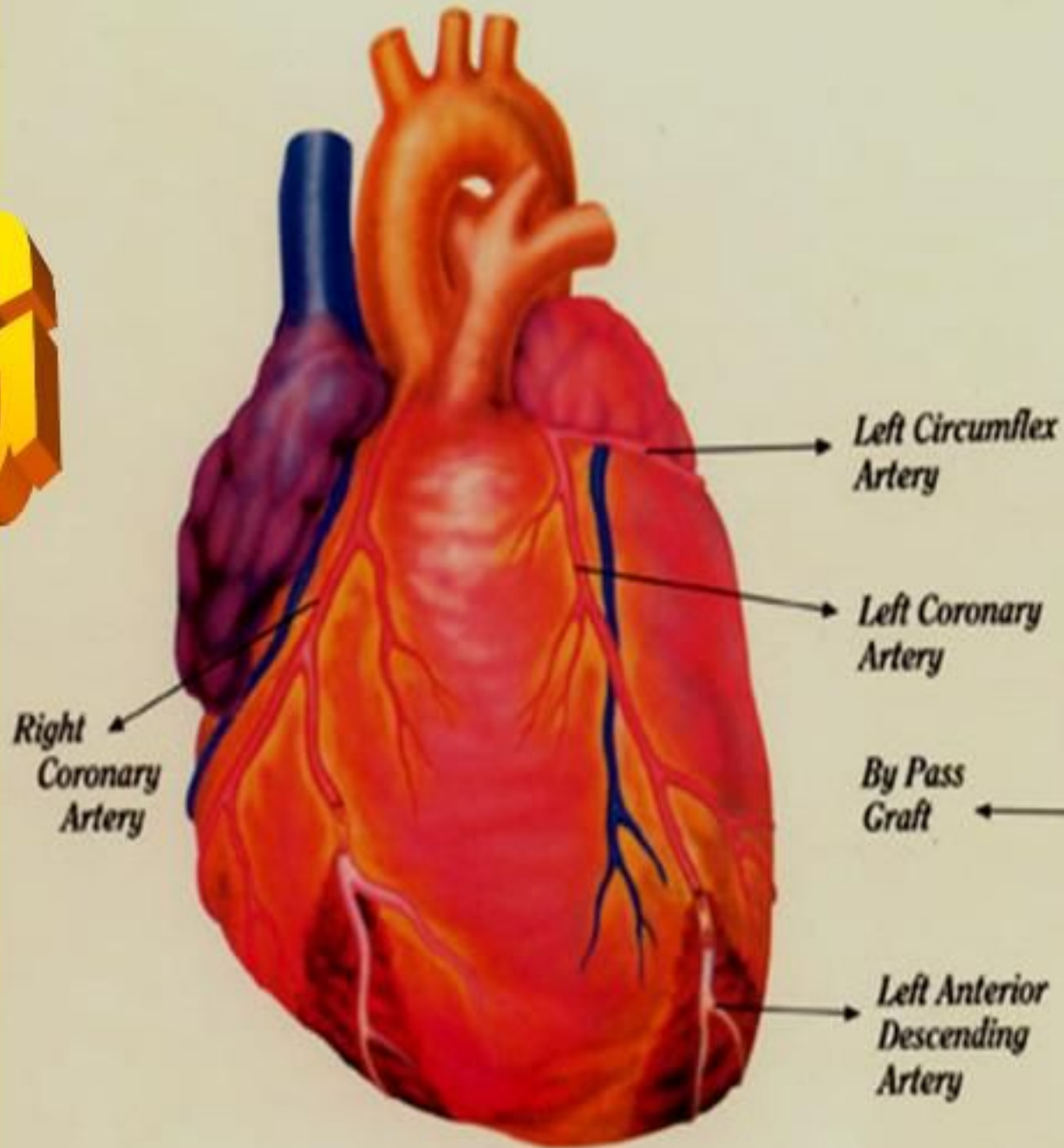


Stent implantation has been developed to treat vascular obstructions caused by atherosclerosis. In this procedure, the stent is mounted on a delivery device and positioned at the site of obstruction.

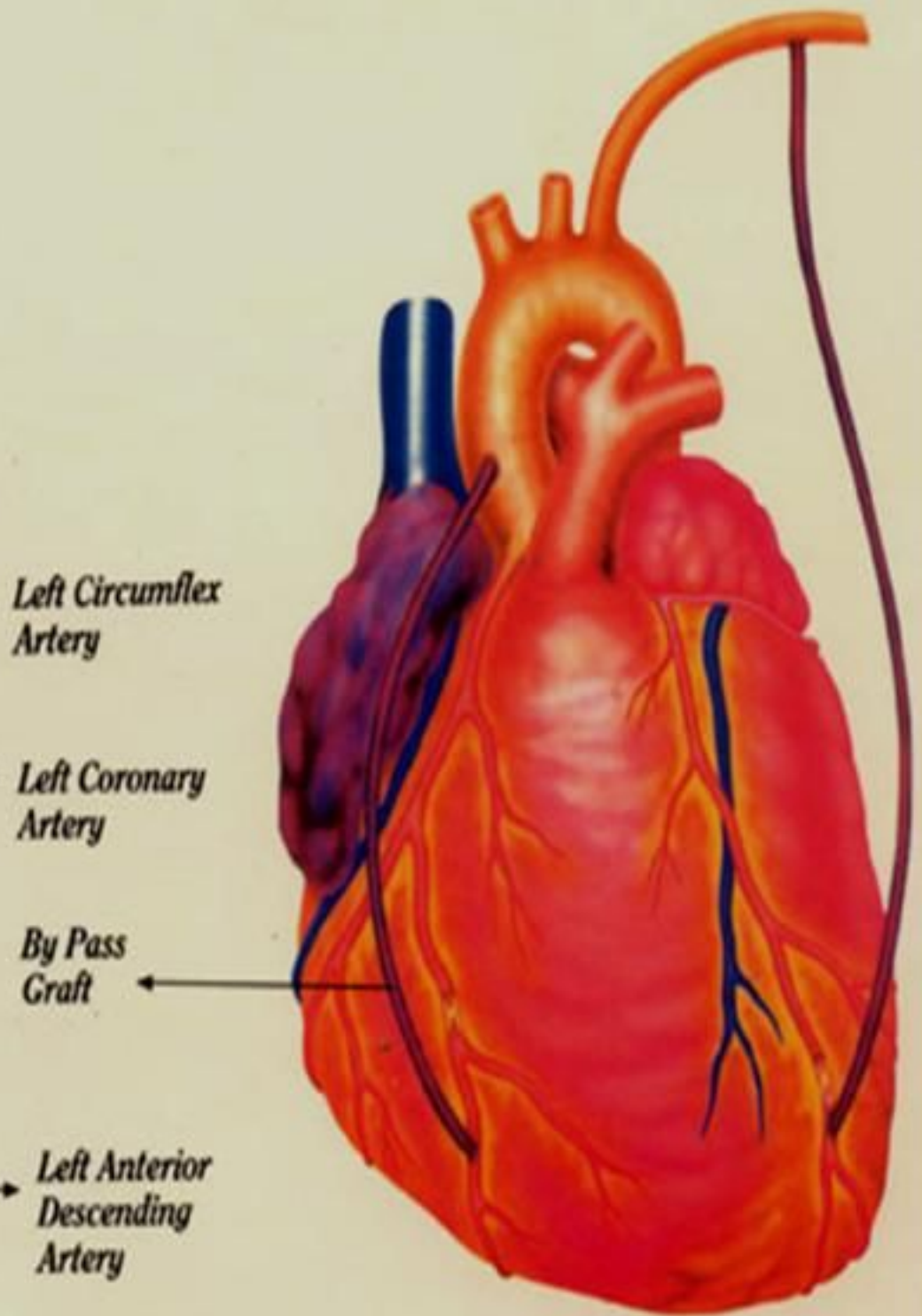


Next, the sheath is withdrawn, allowing the stent to expand, and the catheter is removed, leaving the stent permanently in place to re-establish a clear pathway.

# CABG



*Infarcted heart R and L coronary artery obstruction*

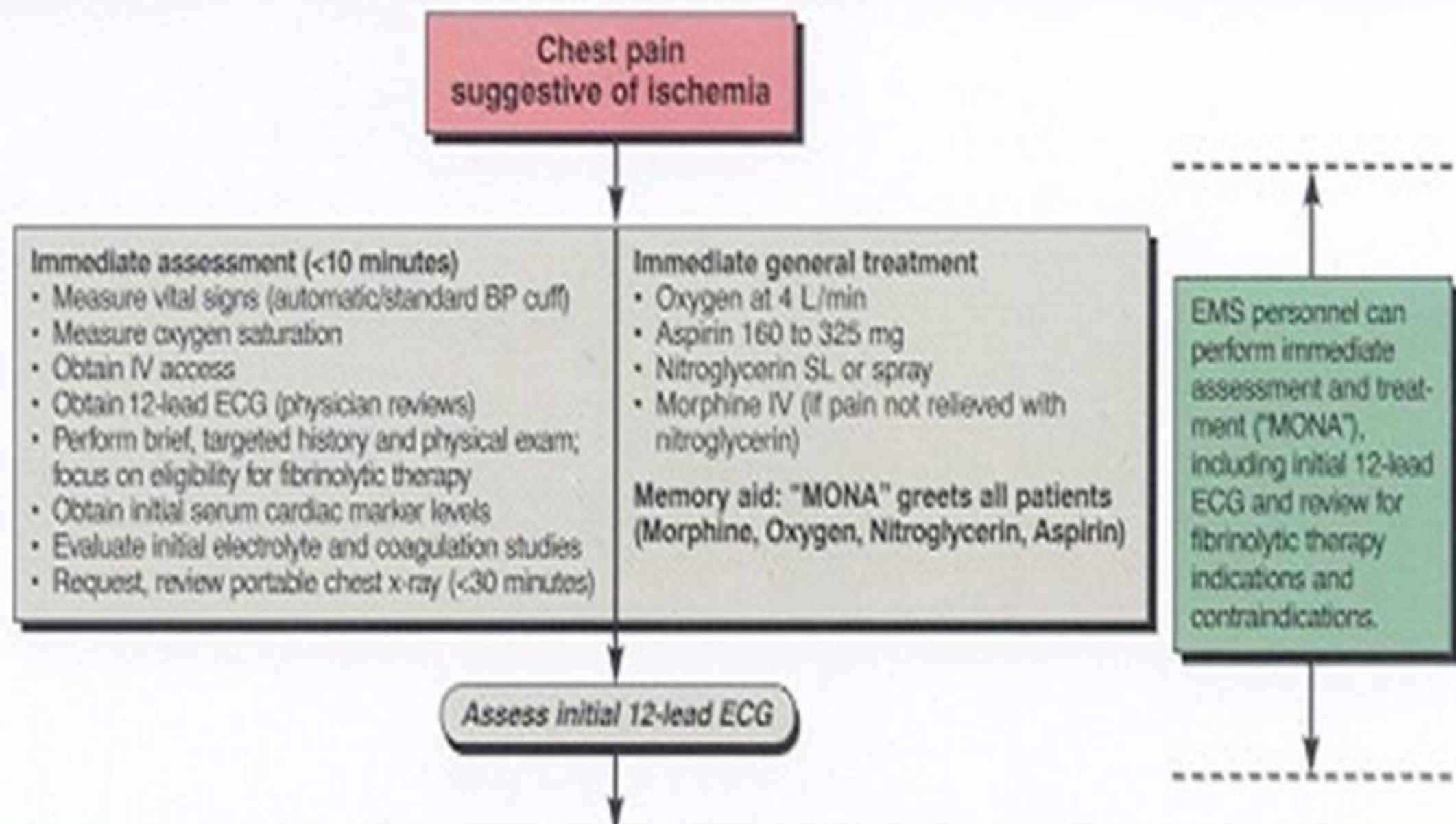


*The placement of coronary artery by-pass grafts*

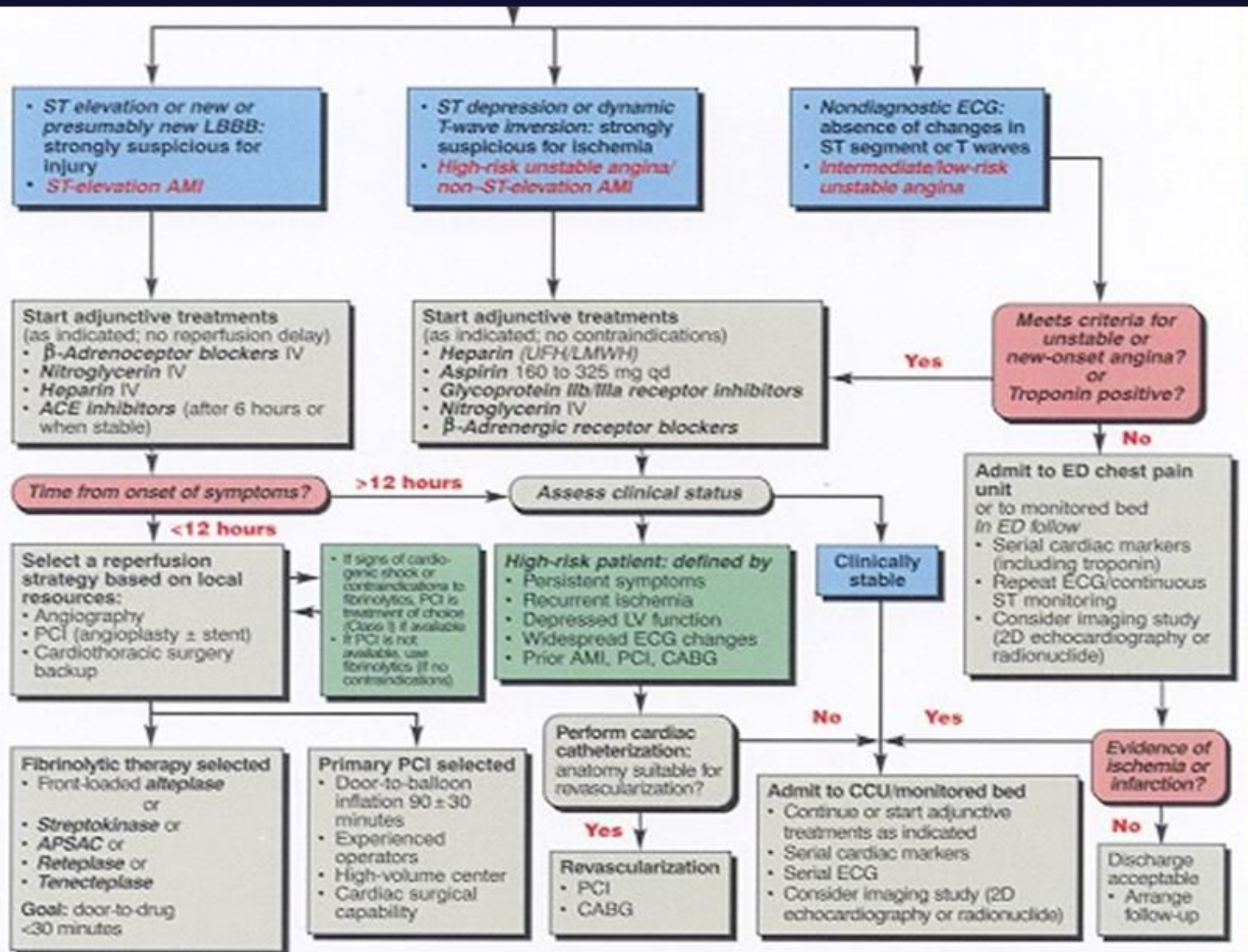


# Algorithm

## Adult Advanced Cardiovascular Life Support



# Algorithm



**2008 ESC GUIDELINES:  
Management of acute  
myocardial infarction in  
patients presenting with  
persistent ST-segment  
elevation (STEMI)**

# Reperfusion Therapy

Recommendations	Class	LOE
<ul style="list-style-type: none"><li>■ Indicated in all pts with chest pain/discomfort of &lt; 12 h and with persistent ST-segment elevation or (presumed) new LBBB</li></ul>	I	A
<ul style="list-style-type: none"><li>■ Should be considered if there is clinical and/or ECG evidence of ongoing ischaemia if symptoms started &gt; 12 h before</li></ul>	IIa	C
<ul style="list-style-type: none"><li>■ Reperfusion (PCI) in stable pts presenting &gt; 12 h to 24 h after symptom onset</li></ul>	IIb	B
<ul style="list-style-type: none"><li>■ PCI of totally occluded infarct artery in stable pts &gt; 24 h after symptom onset without signs of ischaemia</li></ul>	III	B

# Reperfusion Therapy: Primary PCI

Recommendations	Class	LOE
<ul style="list-style-type: none"><li>■ Preferred reperfusion treatment if performed by an experienced team as soon as possible after FMC</li></ul>	I	A
<ul style="list-style-type: none"><li>■ Time from FMC to balloon should be &lt; 2 h in any case and &lt; 90 min in pts presenting early (e.g. &lt; 2 h) with large infarct and low bleeding risk</li></ul>	I	B
<ul style="list-style-type: none"><li>■ Indicated for patients in shock and those with contraindications to fibrinolytic therapy irrespective of time delay</li></ul>	I	B
<b>Rescue PCI</b> <ul style="list-style-type: none"><li>■ After failed fibrinolysis in patients with large infarcts if performed within 12 h</li></ul>	IIa	A

# Reperfusion Therapy: Fibrinolytic Therapy

Recommendations	Class	LOE
<ul style="list-style-type: none"><li>■ In the absence of contraindications and if primary PCI cannot be performed within the recommended time</li></ul>	I	A
<ul style="list-style-type: none"><li>■ A fibrin-specific agent should be given</li></ul>	I	B
<ul style="list-style-type: none"><li>■ Pre-hospital initiation of fibrinolytic therapy</li></ul>	IIa	A

# Long-Term Medical Treatment

Recommendations	Class	LOE
<b><u>Antiplatelets</u></b>		
■ Aspirin for ever (75 to 100 mg daily) in all patients without allergy	I	A
■ Clopidogrel (75 mg daily) for 12 months in all patients irrespective of the acute treatment	IIa	C
■ Clopidogrel (75 mg daily) in all patients with contraindication to aspirin	I	B

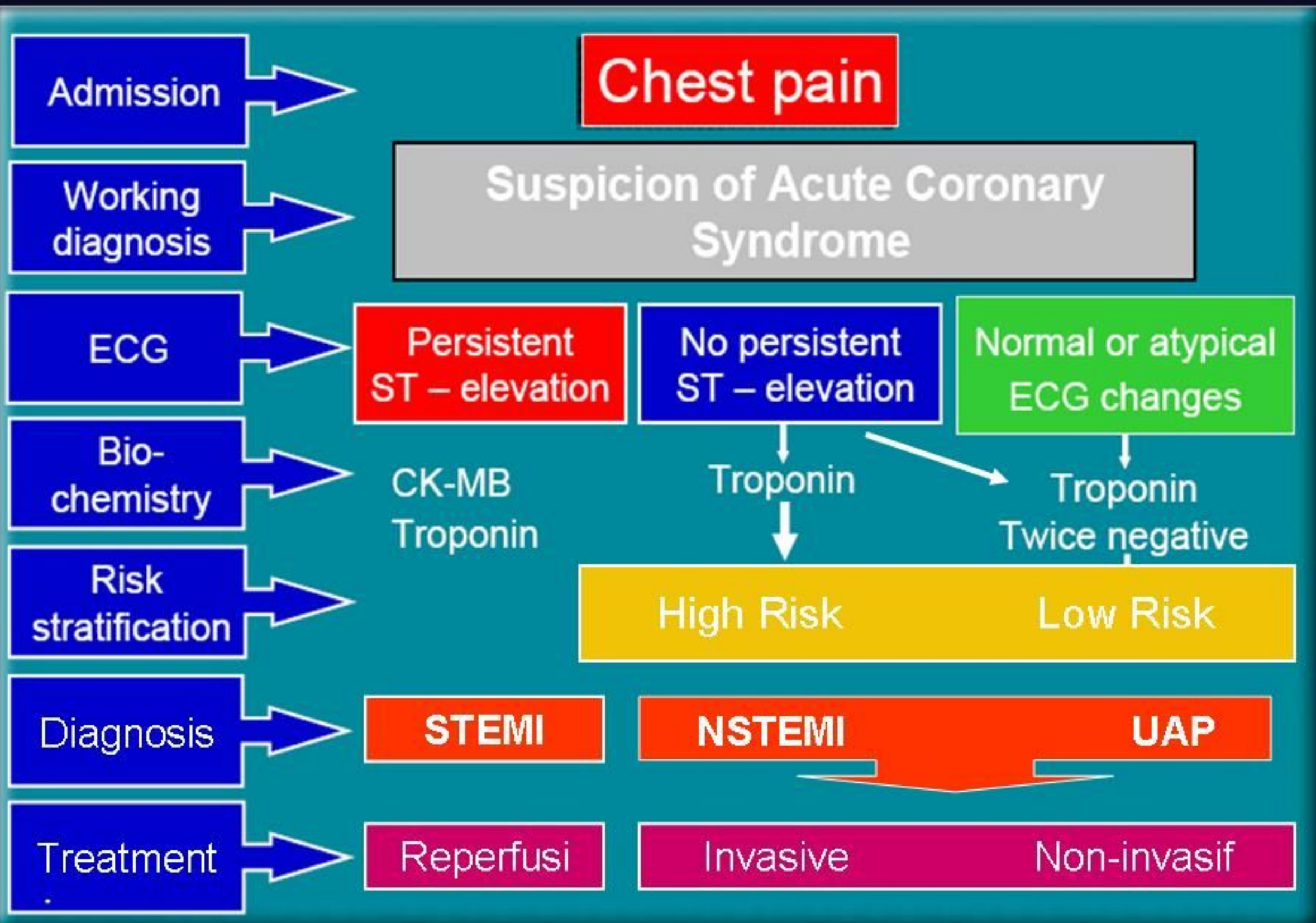
# Long-term Medical Treatment

Recommendations	Class	LOE
<p><b><u>Beta-blockers</u></b></p> <ul style="list-style-type: none"> <li>Oral beta-blockers in all patients who tolerate these medications and without contraindications, regardless of blood pressure or LV function</li> </ul>	I	A
<p><b><u>ACE-I and ARB</u></b></p> <ul style="list-style-type: none"> <li>ACE-I should be considered in all patients without contraindications, regardless of blood pressure or LV function</li> <li>ARB in all patients without contraindications who do not tolerate ACE-inhibitors, regardless of blood pressure or LV function</li> </ul>	IIa	A
	IIa	C
<p><b><u>Statins</u></b></p> <ul style="list-style-type: none"> <li>Statins in all patients, in the absence of contraindications, irrespective of cholesterol levels, initiated as soon as possible to achieve LDLc &lt; 100 mg/dL (2.5 mmol/L)</li> </ul>	I	A
<p><b><u>Influenza immunization</u></b></p> <ul style="list-style-type: none"> <li>In all patients</li> </ul>	I	B



# Long-term Medical Treatment

Recommendations	Class	LOE
<p><b><u>Beta-blockers</u></b></p> <ul style="list-style-type: none"> <li>Oral beta-blockers in all patients who tolerate these medications and without contraindications, regardless of blood pressure or LV function</li> </ul>	I	A
<p><b><u>ACE-I and ARB</u></b></p> <ul style="list-style-type: none"> <li>ACE-I should be considered in all patients without contraindications, regardless of blood pressure or LV function</li> <li>ARB in all patients without contraindications who do not tolerate ACE-inhibitors, regardless of blood pressure or LV function</li> </ul>	IIa	A
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<p><b><u>Influenza immunization</u></b></p> <ul style="list-style-type: none"> <li>In all patients</li> </ul>	I	B



Admission

Working diagnosis

ECG

Bio-chemistry

Risk stratification

Diagnosis

Treatment

**Chest pain**

Suspicion of Acute Coronary Syndrome

Persistent ST – elevation

No persistent ST – elevation

Normal or atypical ECG changes

CK-MB  
Troponin

Troponin

Troponin  
Twice negative

High Risk      Low Risk

**STEMI**

**NSTEMI**      **UAP**

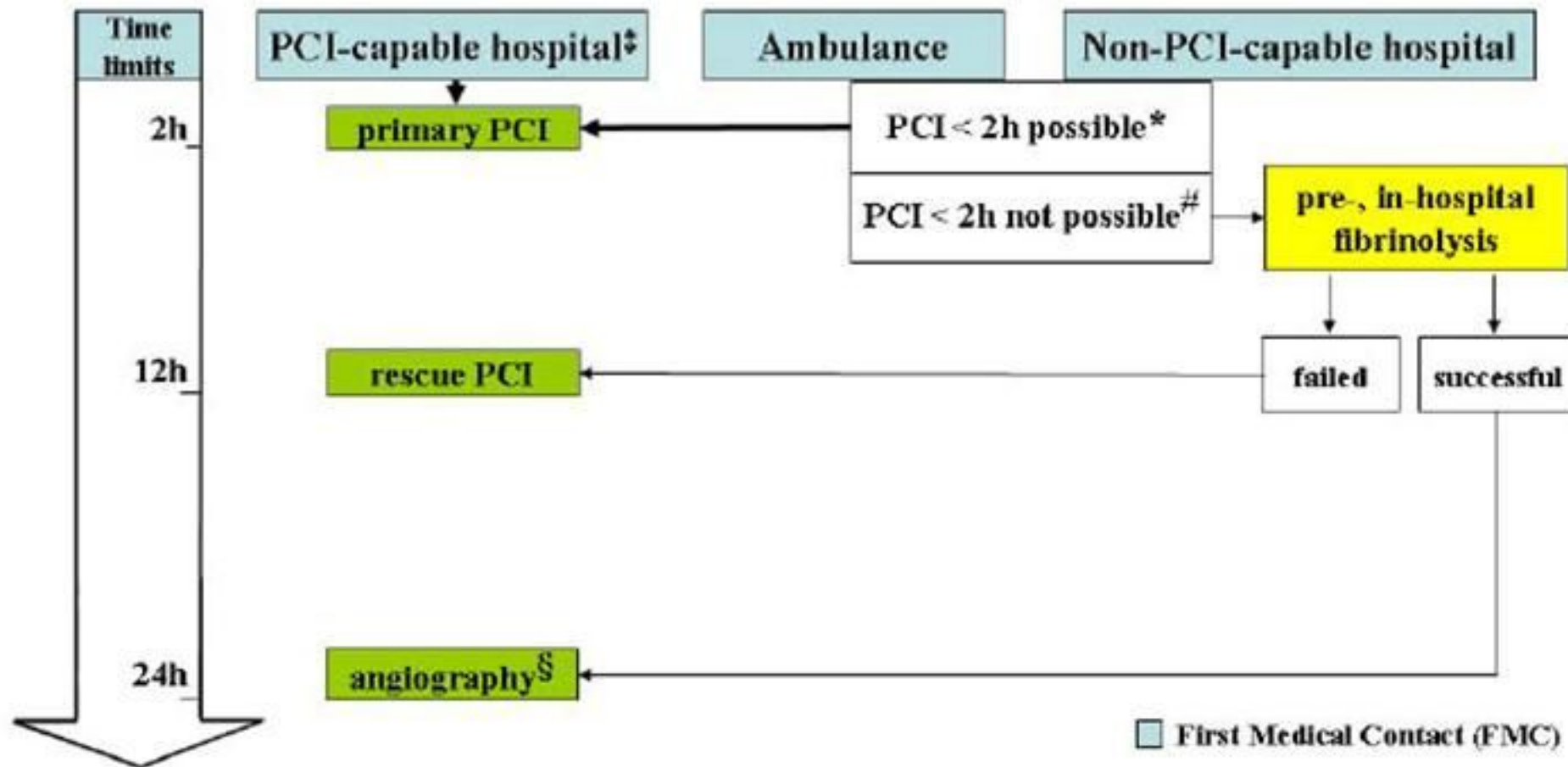
Reperfusion

Invasive      Non-invasive



**Terima Kasih**

# Reperfusion Strategies



\* Time FMC to first balloon inflation must be shorter than 90 min in patients presenting early (< 2 h after symptom onset), with large amount of viable myocardium and low risk of bleeding.

# If PCI is not possible < 2 h of FMC, start fibrinolytic therapy as soon as possible.

§ Not earlier than 3 h after start fibrinolysis

‡ 24/7 service

# Long-Term Medical Treatment

Recommendations	Class	LOE
<b><u>Anticoagulants</u></b>		
<ul style="list-style-type: none"> <li>■ Oral anticoagulant at INR 2-3 in patients who do not tolerate aspirin or clopidogrel</li> </ul>	IIa	B
<ul style="list-style-type: none"> <li>■ Oral anticoagulant at recommended INR when clinically indicated (e.g. atrial fibrillation, LV thrombus, mechanical valve)</li> </ul>	I	A
<ul style="list-style-type: none"> <li>■ Oral anticoagulant (at INR 2-3) in addition to low-dose aspirin (75-100 mg) in patients at high risk of thromboembolic events</li> </ul>	IIa	B
<ul style="list-style-type: none"> <li>■ Oral anticoagulant in addition to aspirin and clopidogrel (recent stent placement plus indication for oral anticoagulation)*</li> </ul>	IIb	C
<ul style="list-style-type: none"> <li>■ Oral anticoagulant in addition to clopidogrel or aspirin (recent stent placement plus indication for oral anticoagulation and increased risk of bleeding)</li> </ul>	IIb	C

\*If long-term oral anticoagulation is required use of a bare metal stent rather than a drug-eluting stent will expose the patient to a shorter duration of triple therapy and hence a lower bleeding risk

# Long-term Management of Specific Coronary Risk Factors

Recommendations	Class	LOE
<b>Smoking cessation</b>		
<ul style="list-style-type: none"> <li>Assess smoking status and advise to quit and to avoid passive smoking at each visit</li> </ul>	I	B
<ul style="list-style-type: none"> <li>Bupropione and nicotine treatment in patients who keep smoking at follow-up</li> </ul>	I	B
<ul style="list-style-type: none"> <li>Antidepressants</li> </ul>	IIa	C
<b>Physical activity</b>		
<ul style="list-style-type: none"> <li>Exercise test-guided moderate intensity aerobic exercise at least 5 times per week</li> </ul>	I	B
<ul style="list-style-type: none"> <li>Medically supervised rehabilitation programmes for high-risk patients</li> </ul>	I	B
<b>Diabetes management</b>		
<ul style="list-style-type: none"> <li>Lifestyle changes and pharmacotherapy to achieve HbA1C &lt; 6.5 %</li> </ul>	I	B
<ul style="list-style-type: none"> <li>Intensive modification of other risk factors (hypertension, obesity, dyslipidaemia)</li> </ul>	I	B
<ul style="list-style-type: none"> <li>Coordination with a physician specialized in diabetes</li> </ul>	I	B

## Long-term Management of Specific Coronary Risk Factors

Recommendations	Class	LOE
<b><u>Diet and weight reduction</u></b>		
<ul style="list-style-type: none"> <li>Weight reduction is recommended when BMI is <math>\geq 30</math> kg/m<sup>2</sup> or more, and when waist circumference is more than 102/88 cm (men/women)</li> <li>Diet based on low intake of salt and saturated fats and regular intake of fruit, vegetables and fish</li> <li>Increased consumption of omega-3 fatty acids (oily fish)</li> <li>Supplementation with 1 g of fish oil in patients with a low intake of oily fish</li> <li>Moderate alcohol consumption should not be discouraged</li> </ul>	I  I IIb IIa	B  B B
<b><u>Blood pressure control</u></b>		
<ul style="list-style-type: none"> <li>Lifestyle changes and pharmacotherapy to achieve BP &lt; 130/80 mmHg</li> </ul>	I	A

## Long-term Management of Specific Coronary Risk Factors

Recommendations	Class	LOE
<b><u>Lipid management</u></b>		
<ul style="list-style-type: none"> <li>■ <b>Statins in all patients, in the absence of contraindications, irrespective of cholesterol levels, initiated as soon as possible to achieve LDLc &lt; 100 mg/dl (2.5 mmol/L)</b></li> </ul>	I	A
<ul style="list-style-type: none"> <li>■ <b>Further reduction of LDLc &lt; 80 mg/dL (2 mmol/L) should be considered in high risk patients</b></li> </ul>	IIa	A
<ul style="list-style-type: none"> <li>■ <b>Lifestyle change emphasized if TG &gt; 150 mg/dL (1.7 mmol/L) and/or HDLc &lt; 40 mg/dL (1.0 mmol/L)</b></li> </ul>	I	B
<ul style="list-style-type: none"> <li>■ <b>Fibrates and omega-3 supplements should be considered in patients who do not tolerate statins, especially if TG &gt; 150 mg/dL (1.7 mmol/L) and/or HDLc &lt; 40 mg/dL (1.0 mmol/L)</b></li> </ul>	IIa	B

