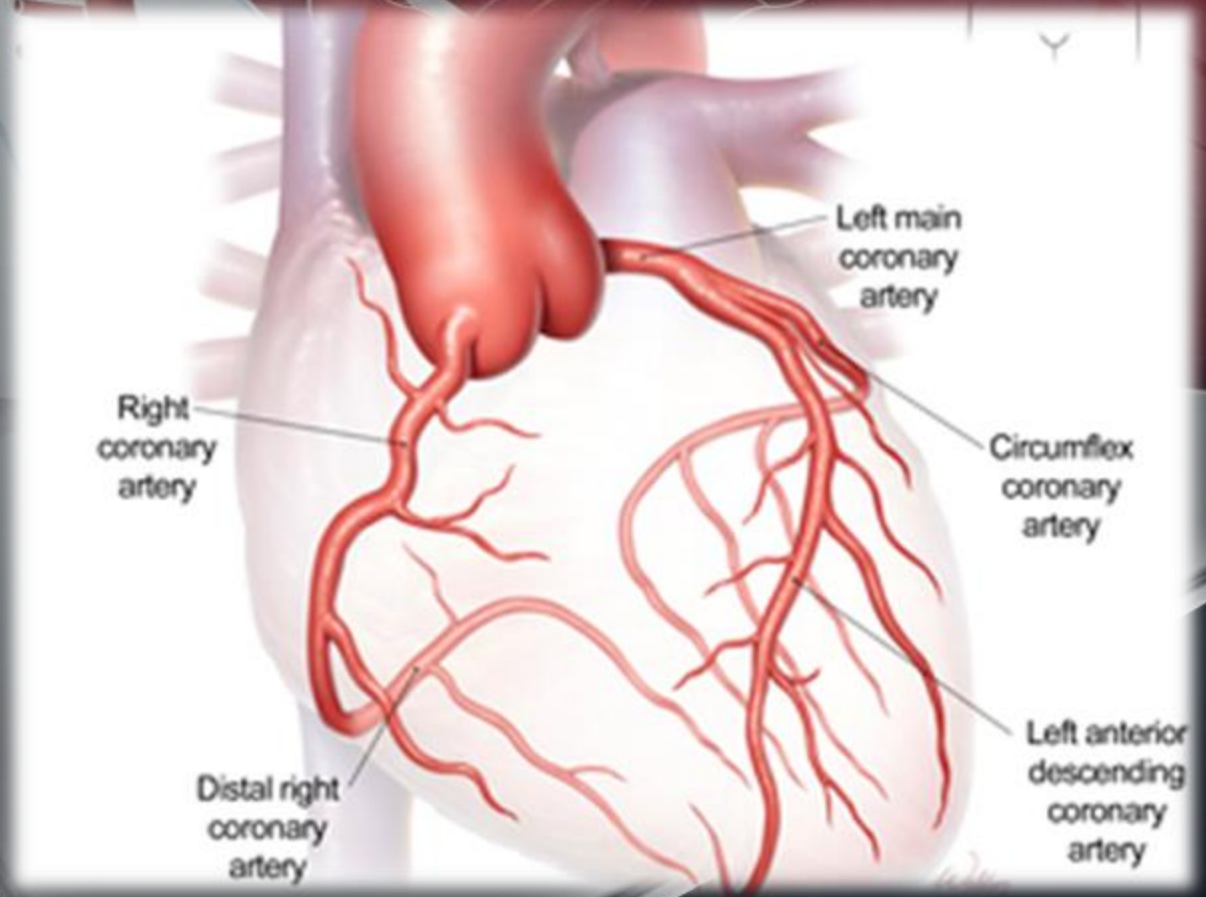
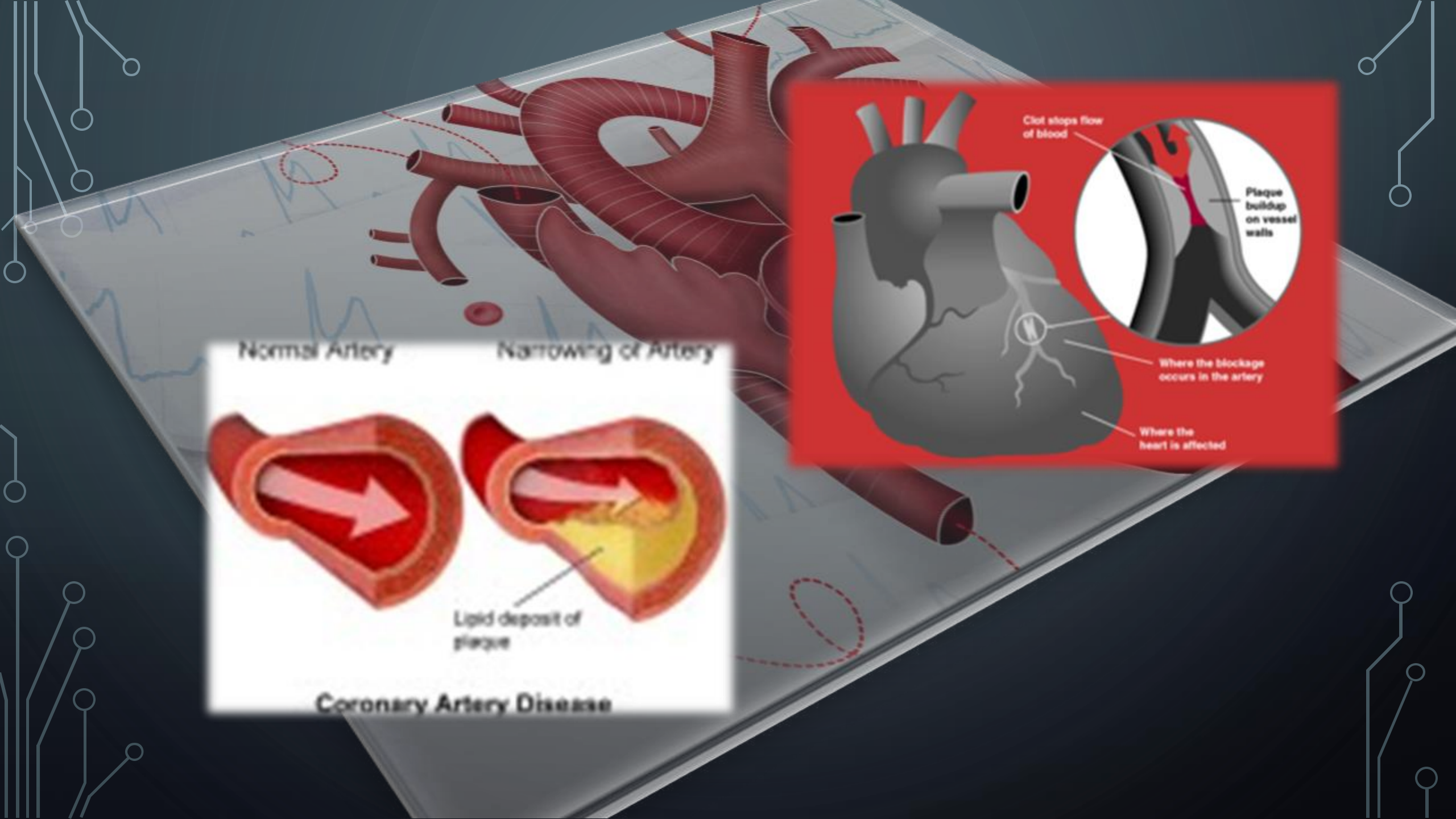
Acute coronary syndrome

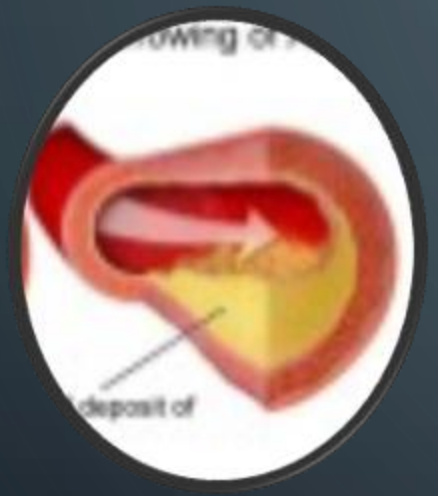
Dr.Dujrath
Somboonviboon

Acute coronary syndrome

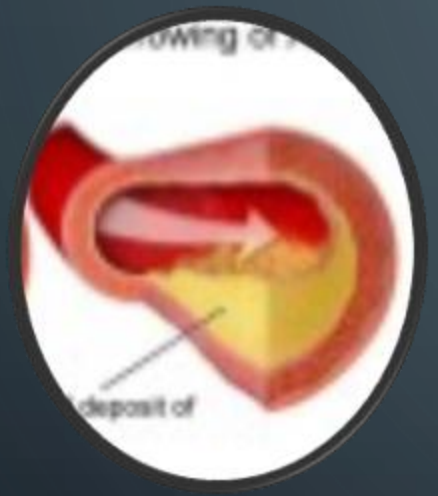



Clot stops flow of blood
Plaque buildup on vessel walls
Where the blockage occurs in the artery
Where the heart is affected
Normal Artery
Narrowing of Artery
Lipid deposit of plaque
Coronary Artery Disease


Supply
Demand

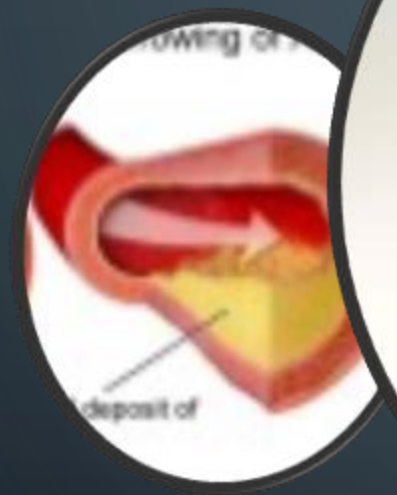



Supply
Demand

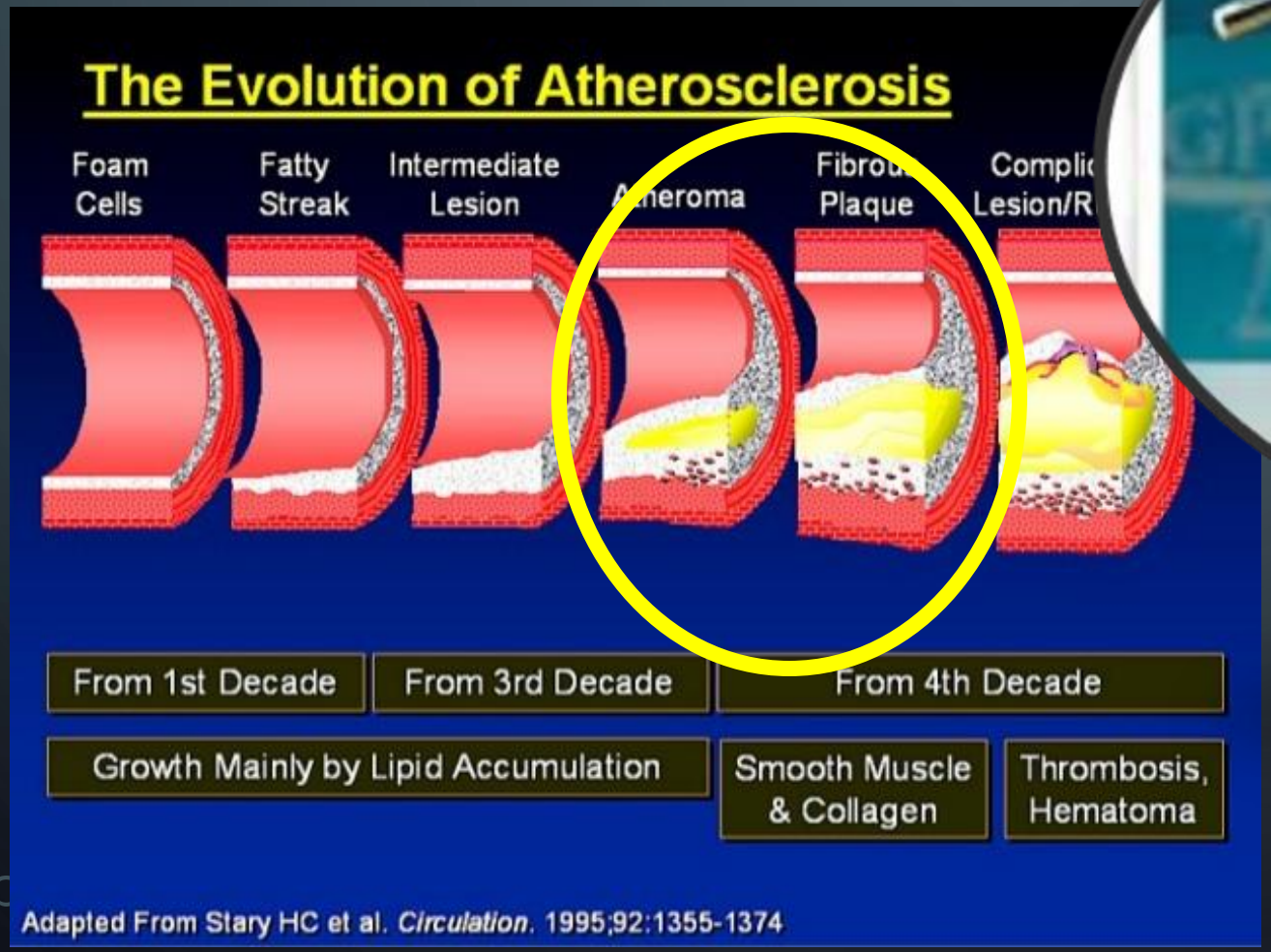


Supply

Demand

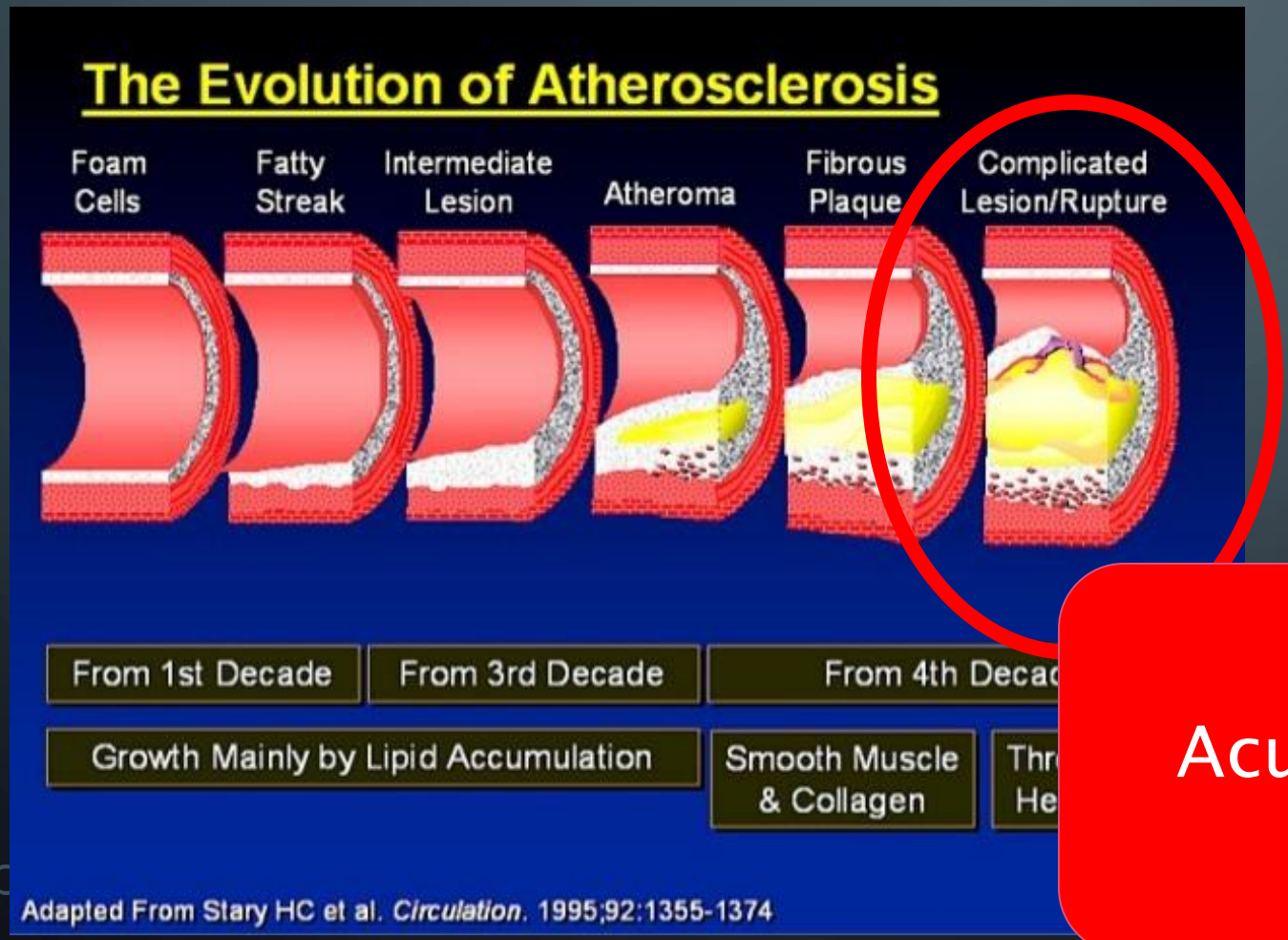

deposit of

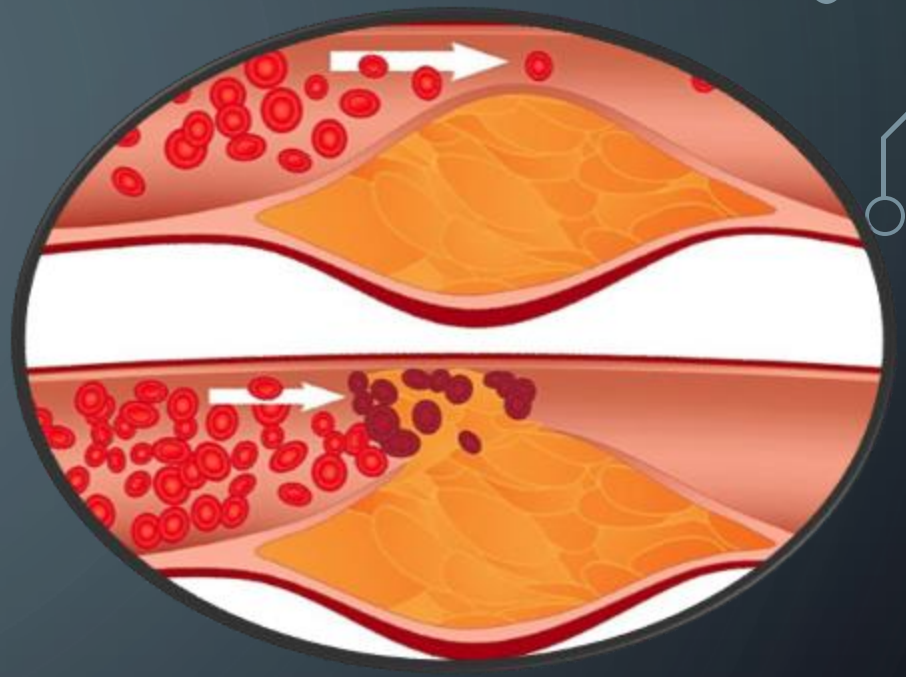
PATHOGENESIS



Chronic stable angina

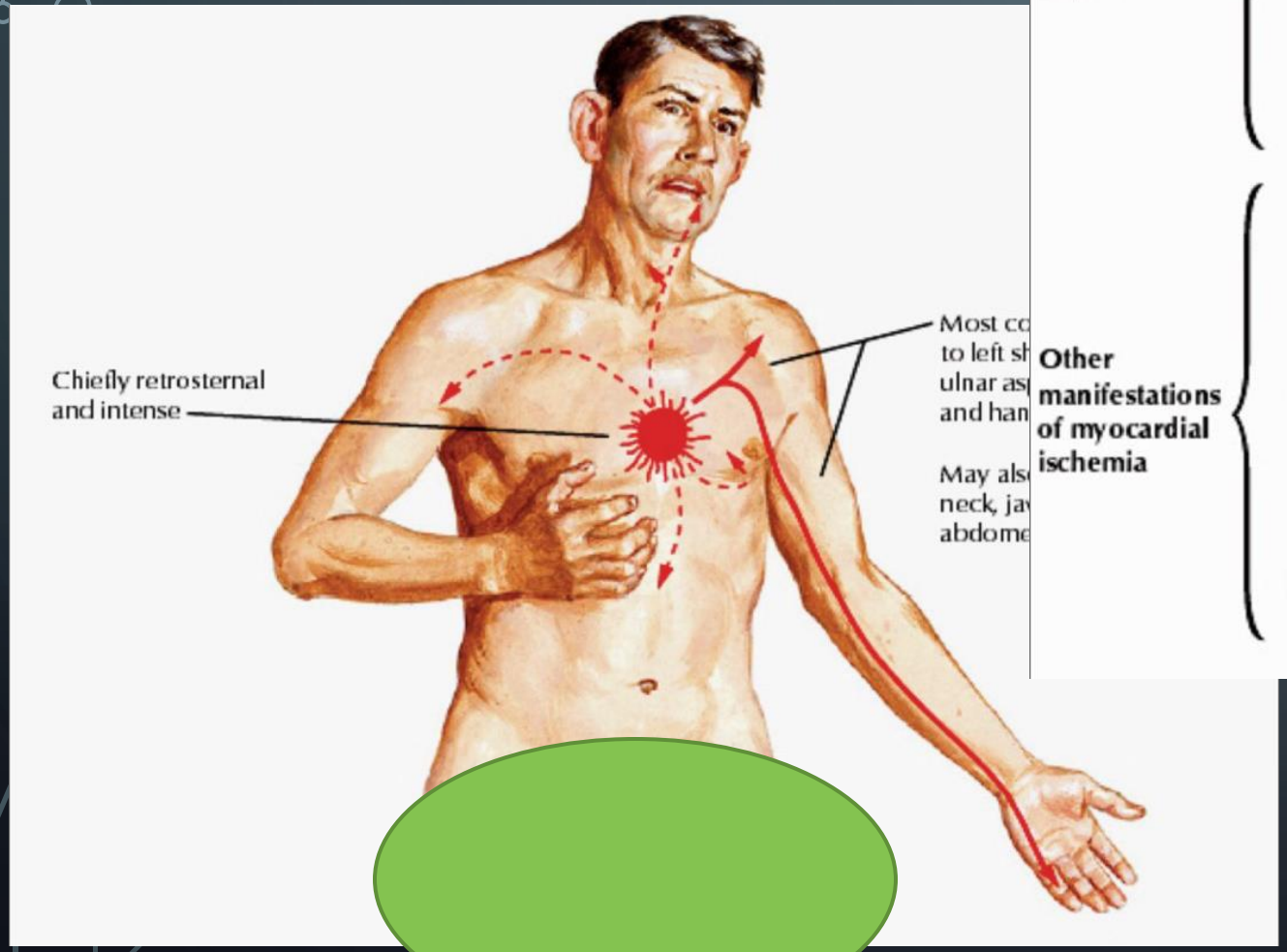
PATHOGENESIS

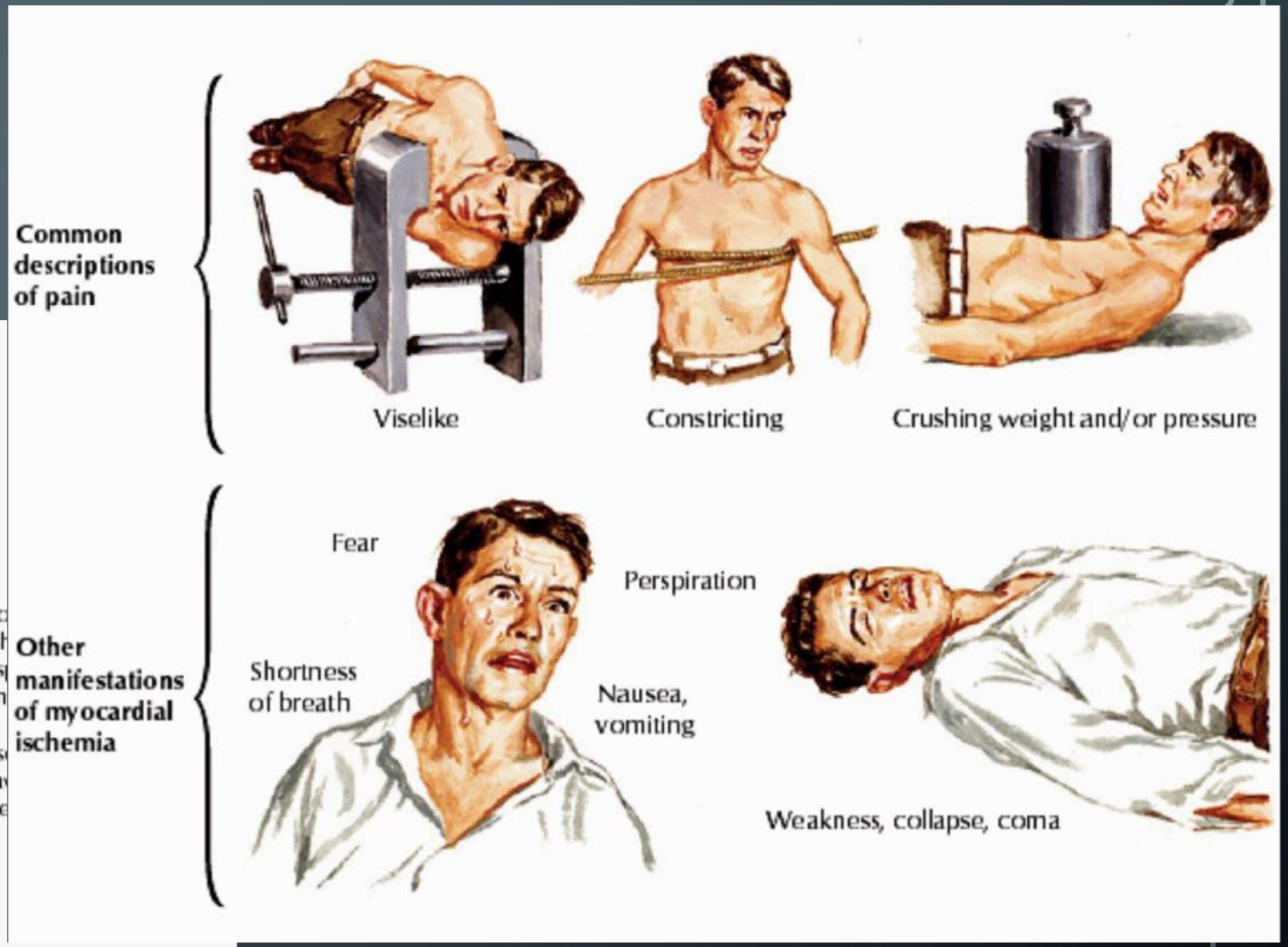




Acute coronary syndrome

SYMPTOMS


Chiefly retrosternal and intense
Most co
to left sh
ulnar asp
and han
May also
neck, jaw
abdome


Common descriptions of pain
Viselike
Constricting
Crushing weight and/or pressure
Other manifestations of myocardial ischemia
Fear
Perspiration
Shortness of breath
Nausea, vomiting
Weakness, collapse, coma

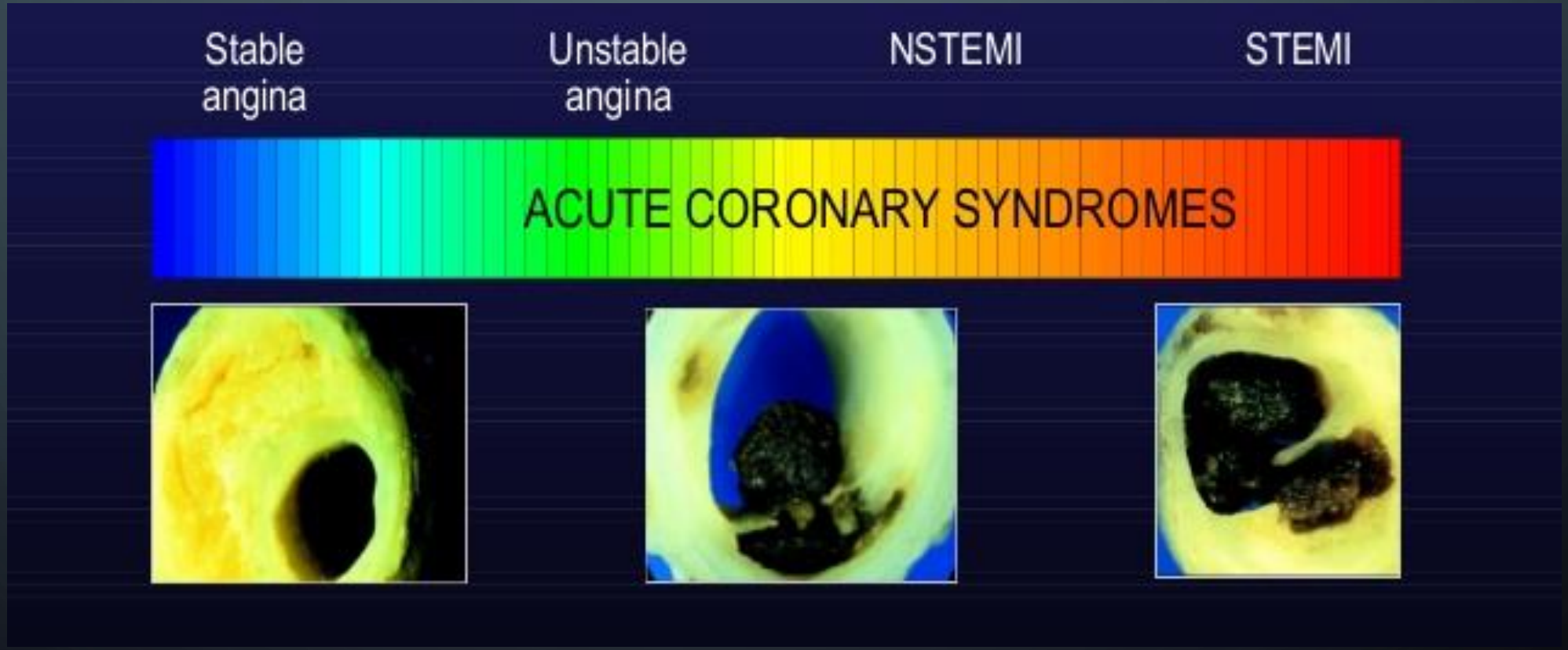
DEFINITION OF MYOCARDIAL INFARCTION

Acute cardiomyocyte necrosis

- Increase/decrease cardiac enz (Hs tropT)
- With one of following
  - Symptoms of ischemia
  - New ST-T wave changes or LBBB
  - Development of Q wave
  - Imaging evidence of new loss of viable myocardium
  - Intracoronary thrombus detected on angiography or autopsy

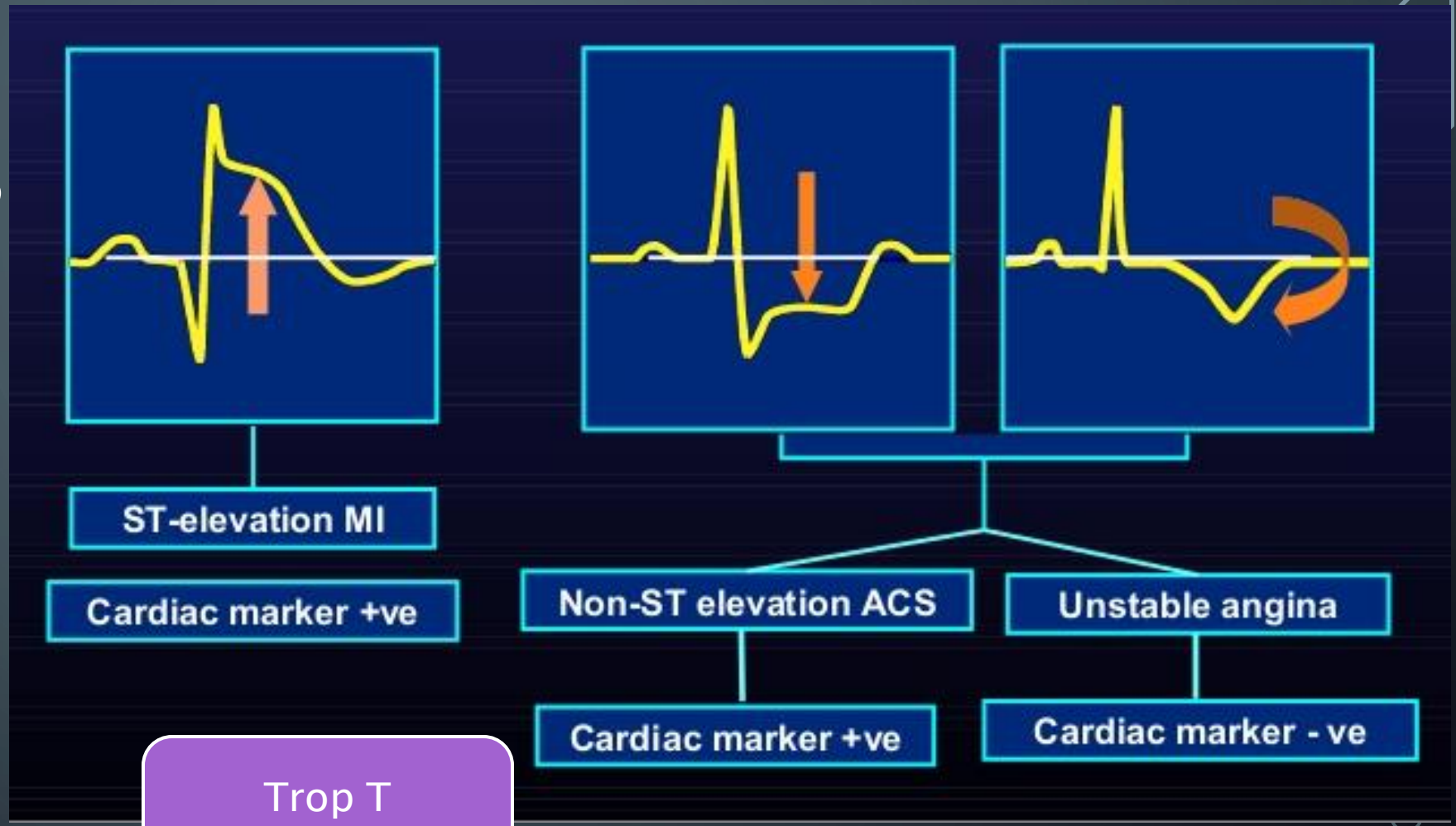
2015 ESC guideline

DIAGNOSIS


Stable angina
Unstable angina
NSTEMI
STEMI
ACUTE CORONARY SYNDROMES

DIAGNOSIS

EKG



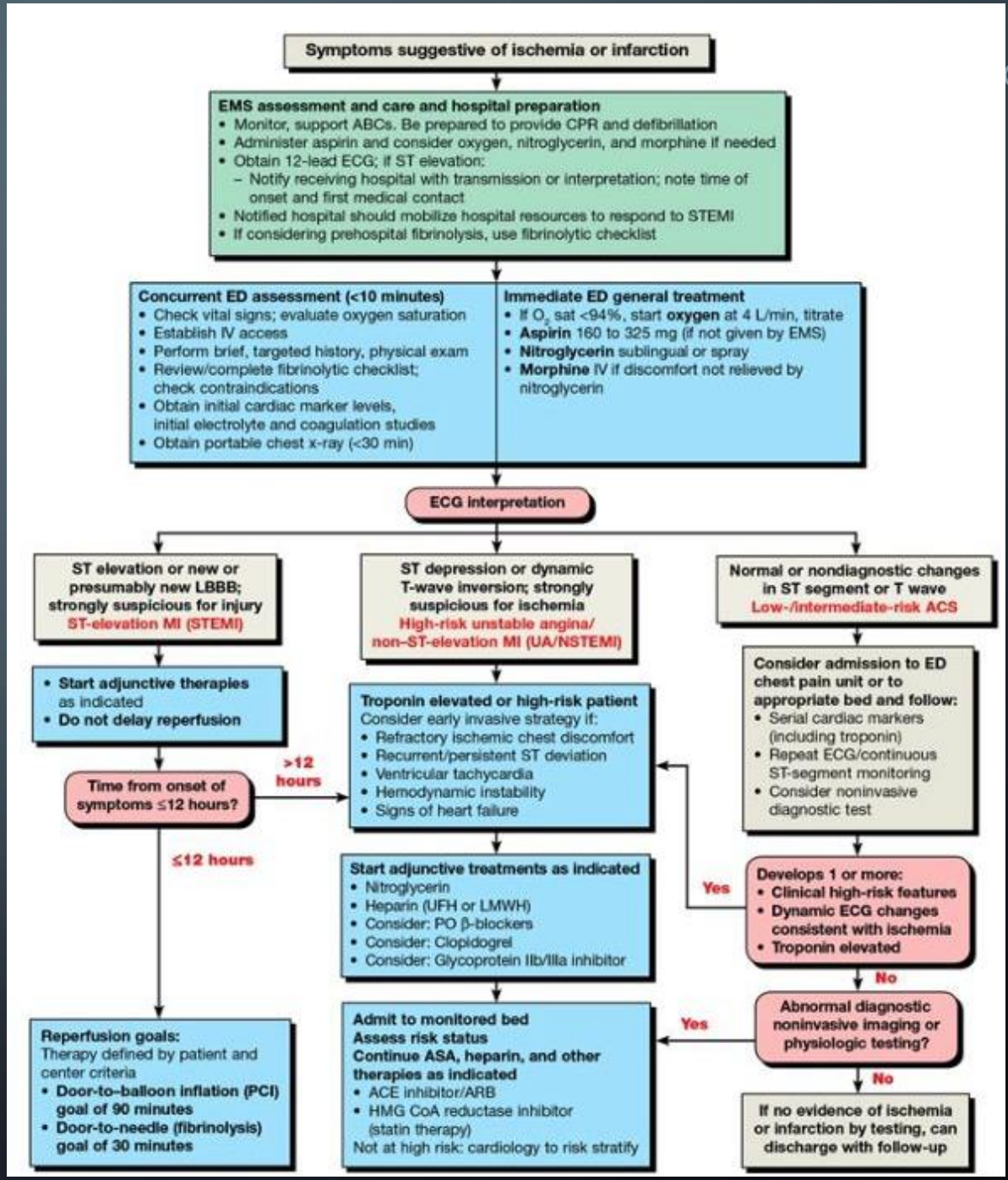
Trop T
CKMB

DIAGNOSIS

Time is LIFE

American Heart Association®

Learn and Live



โรงพยาบาลค่ายฟิชัยดาบหัก
อุบัติเหตุ-ฉุกเฉิน 24 ชม.
EMERGENCY ROOM
AMBULANCE
คุณภาพ ศักดิ์ศรี สามัคคี มีวินัย

At rest > 20 mins

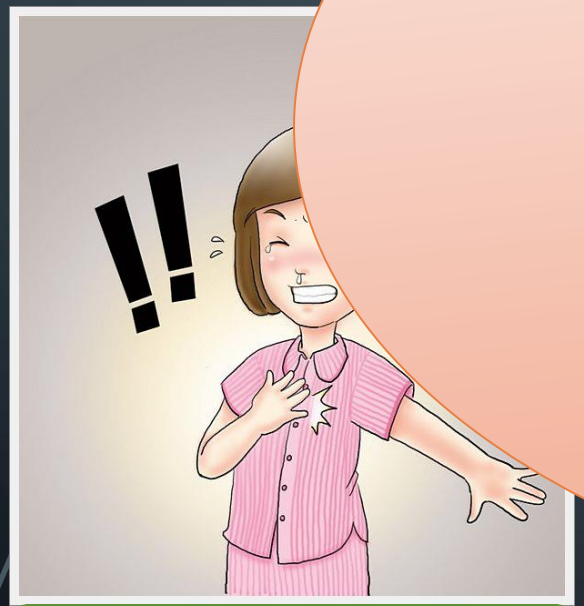
Crescendo angina

New onset

Post MI

Cardiac arrest

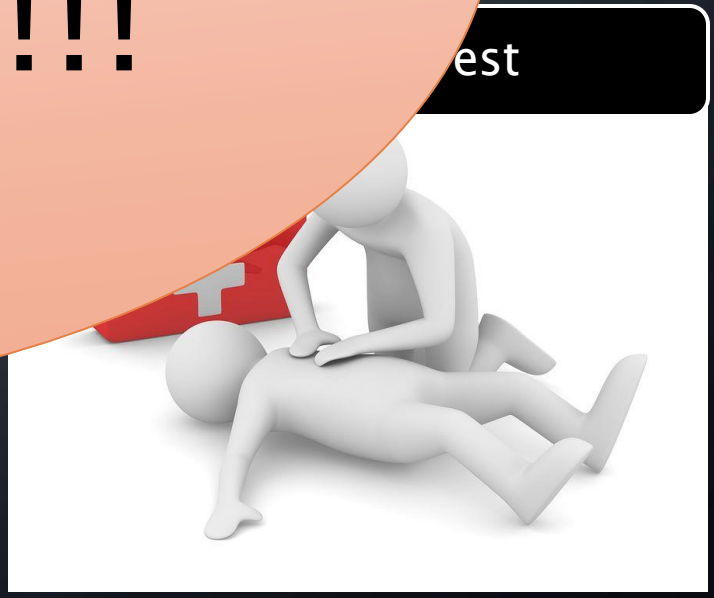
Suspected MI Alert Team !!!!



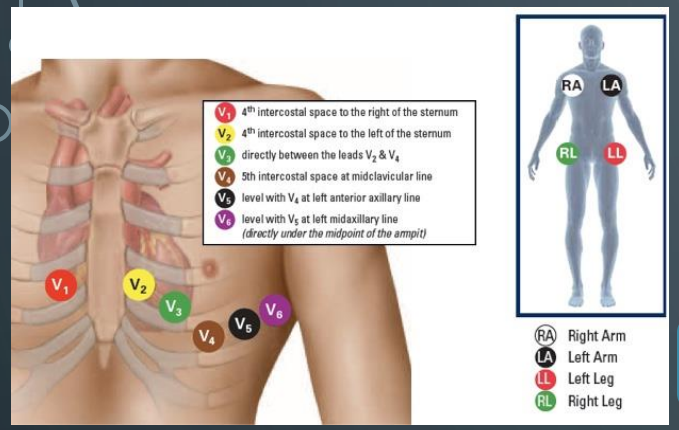
New onset

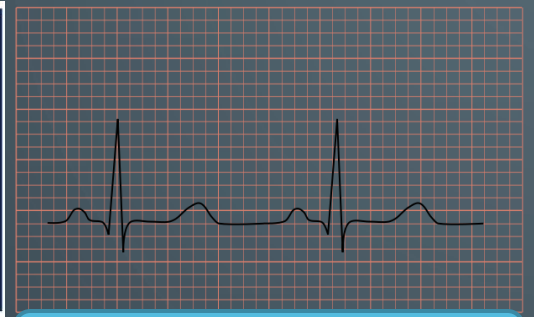
Post MI

est



INITIAL DIAGNOSIS





EKG 12 Leads

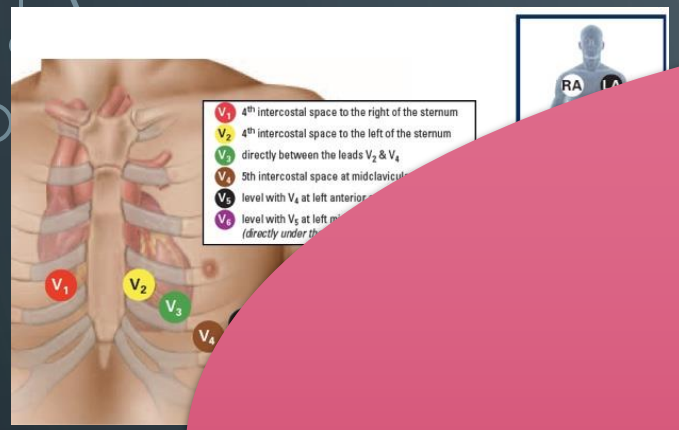
Record vital signs

IV access ,Blood sampling

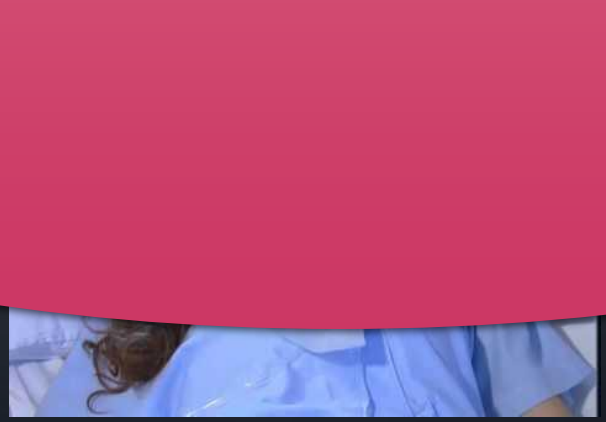
O2 support
(SpO2<95%)

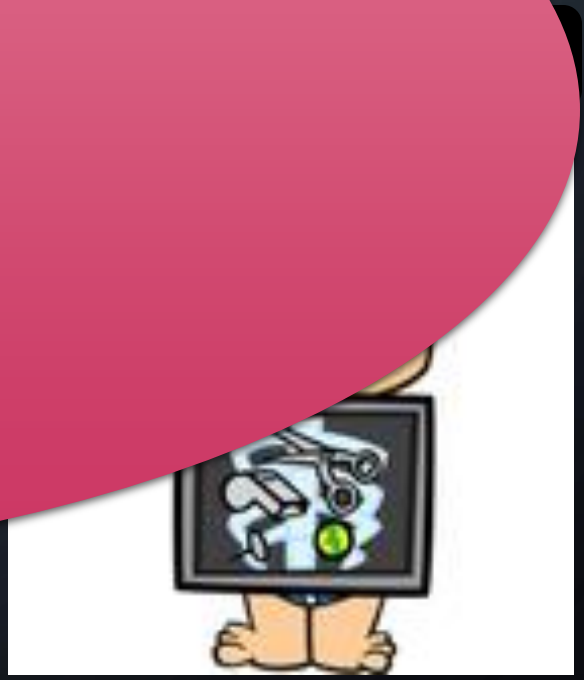
Chest x ray

INITIAL DIAGNOSIS



IV a





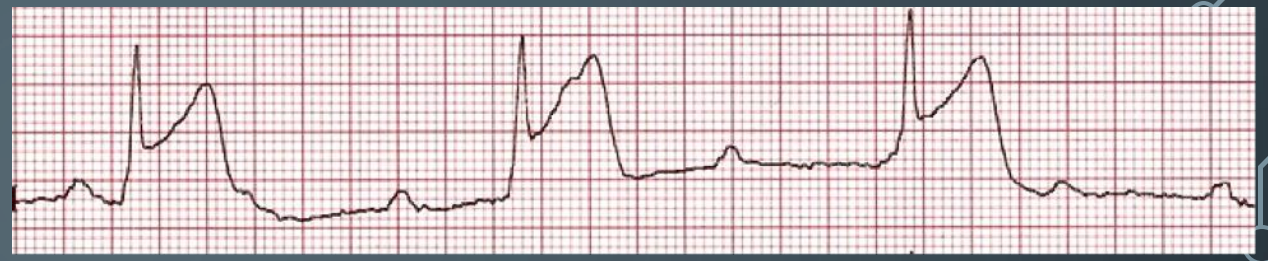
< 10 mins

DIFFERENTIAL DIAGNOSIS

Table 6 **Differential diagnoses of acute coronary syndromes in the setting of acute chest pain**

Cardiac	Pulmonary	Vascular	Gastro-intestinal	Orthopaedic	Other
Myopericarditis Cardiomyopathies[a]	**Pulmonary embolism**	**Aortic dissection**	**Oesophagitis, reflus or spasm**	**Musculoskeletal disorders**	**Anxiety disorders**
Tachyarrhythmias	**(Tension)-Pneumothorax**	Symptomatic aortic aneurysm	Peptic ulcer, gastritis	Chest trauma	Herpes zoster
Acute heart failure	Bronchitis, pneumonia	Stroke	Pancreatitis	Muscle injury/ inflammation	Anaemia
Hypertensive emergencies	Pleuritis		Cholecystitis	Costochondritis	
Aortic valve stenosis				Cervical spine pathologies	
Tako-Tsubo cardiomyopathy					
Coronary spasm					
Cardiac trauma					

ST ELEVATION

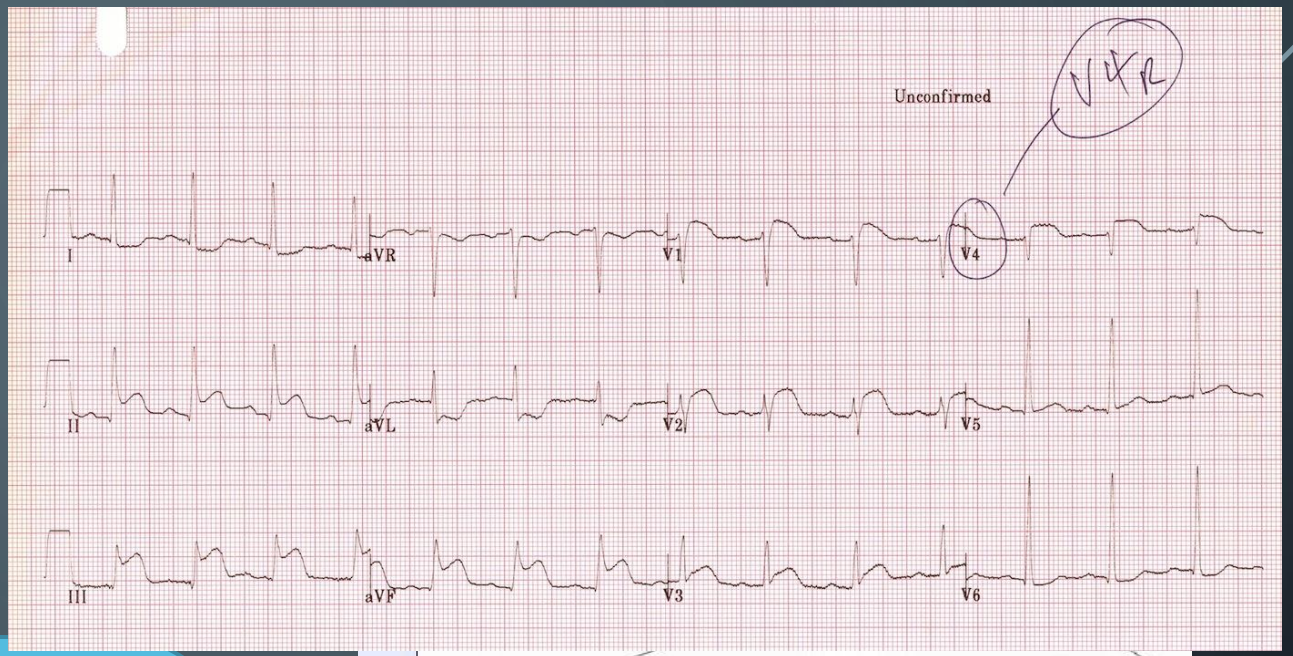


- New ST elevation at J point 2 contiguous leads
  - ≥ 0.1 mV in all leads other than leads V2-V3
- In V2 & V3
  - ≥ 0.15mV in woman
  - ≥ 0.20 mV in men ≥ 40 years
  - ≥ 0.25 mV in men < 40 years
- New LBBB

Contiguous leads

- Anterior leads (V1-V6)
-Inferior leads (II.III.aVF)
-Lateral leads (I,aVL)

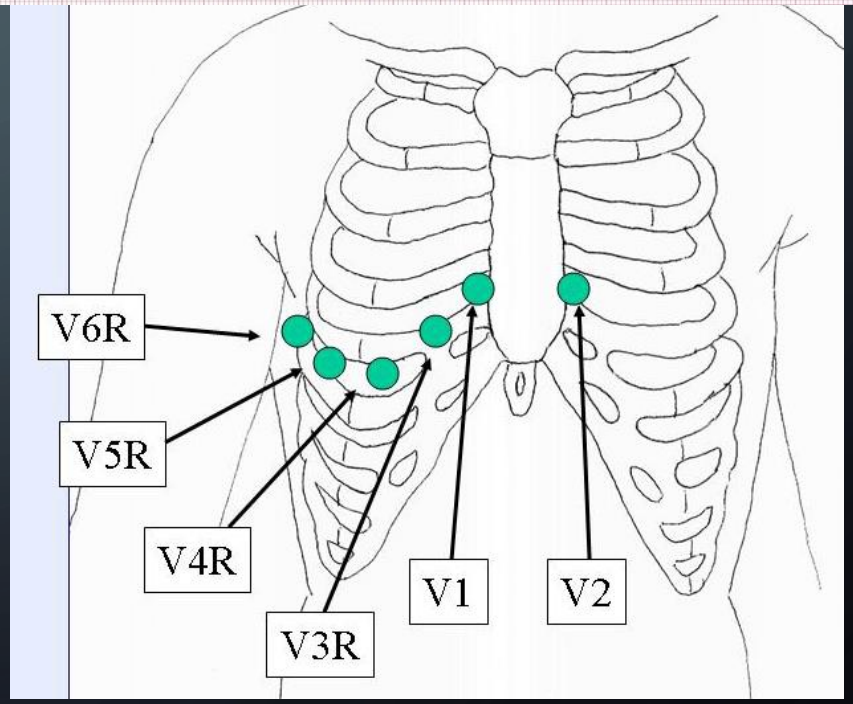
ST ELEVATION



Inferior wall STEMI

Advisable to seek

- RV infarction
- Posterior wall infarction
- AV block



NEW LBBB

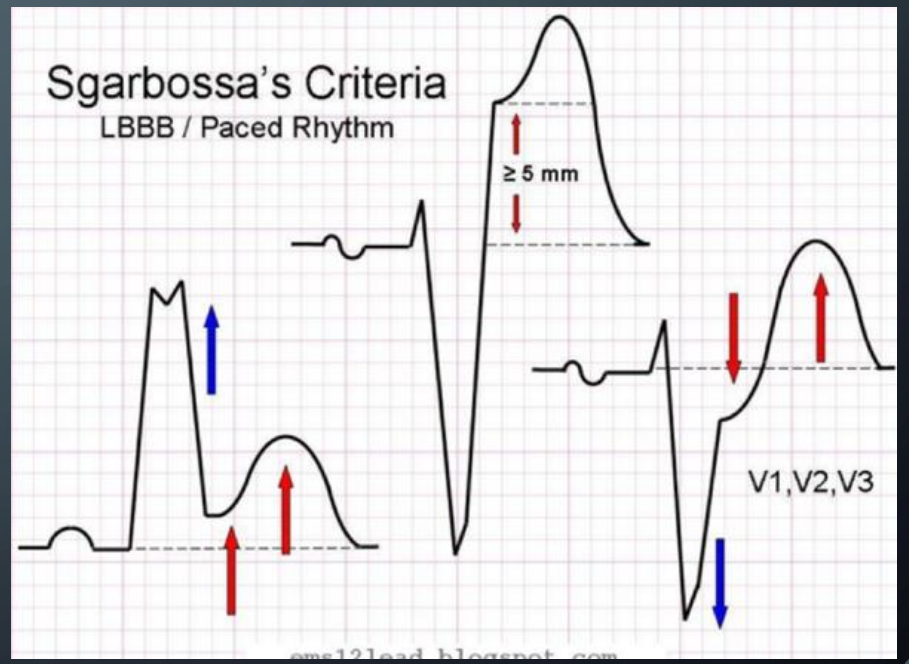
- Previous EKG
- Sgarbossa's Criteria

★ Concordant ST elevation > 1 mm in leads with a positive QRS complex (score 5)

★ Concordant ST depression > 1 mm in V1-V3 (score 3)

★ Excessively discordant ST elevation > 5 mm in leads with a negative QRS complex (score 2).

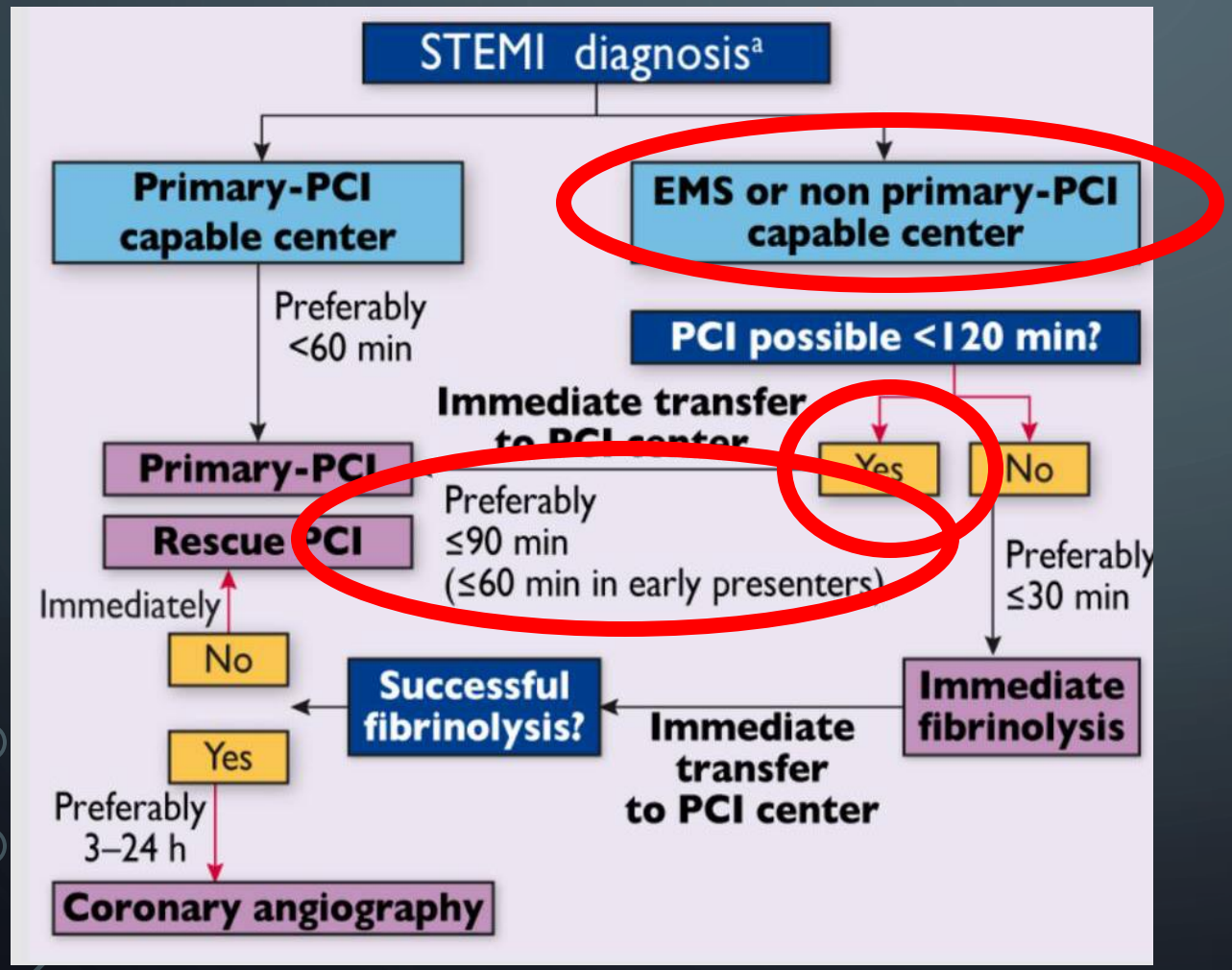
A total score of ≥ 3 has a specificity of 90% for diagnosing myocardial infarction. (sensitive, but not specific)



MANAGEMENT

- Aspirin 325 mg
- Clopidogrel (75mg)
  - Age< 75 years old 600 mg for PCI , 300 mg for fribinolytic
  - Age > 75 years old no loading dose
- Nitrate sublingual
- Morphine

ST ELEVATION



Contact line :

รพ.อุตรดิตถ์

เจ็บแน่นหน้าอกสงสัยเกิดจากโรคหัวใจขาดเลือดฉับพลัน

- เจ็บแน่นหน้าอกติดกัน ≥ 20 นาที หรืออมยาใต้ลิ้นแล้วไม่ได้ผล
- เจ็บหน้าอกรุนแรงขึ้นกว่าที่เคยเป็นมาก่อน

ประเมินเร่งด่วนโดยแพทย์ที่ ER < 10 นาที

- วัด vital signs
- เตรียมเปิด IV
- ตรวจ EKG 12 leads
- ซักประวัติและตรวจร่างกายที่สำคัญ (onset ,duration,medications),(BP ซ้าย /ขวา , Lungs , murmur)
- เจาะเลือด TropT,CKMB,electrolyte,BUN,Cr,CBC.Coagulogram,LFT
- CXR

ดูลักษณะ EKG

ST elevtion
New LBBB

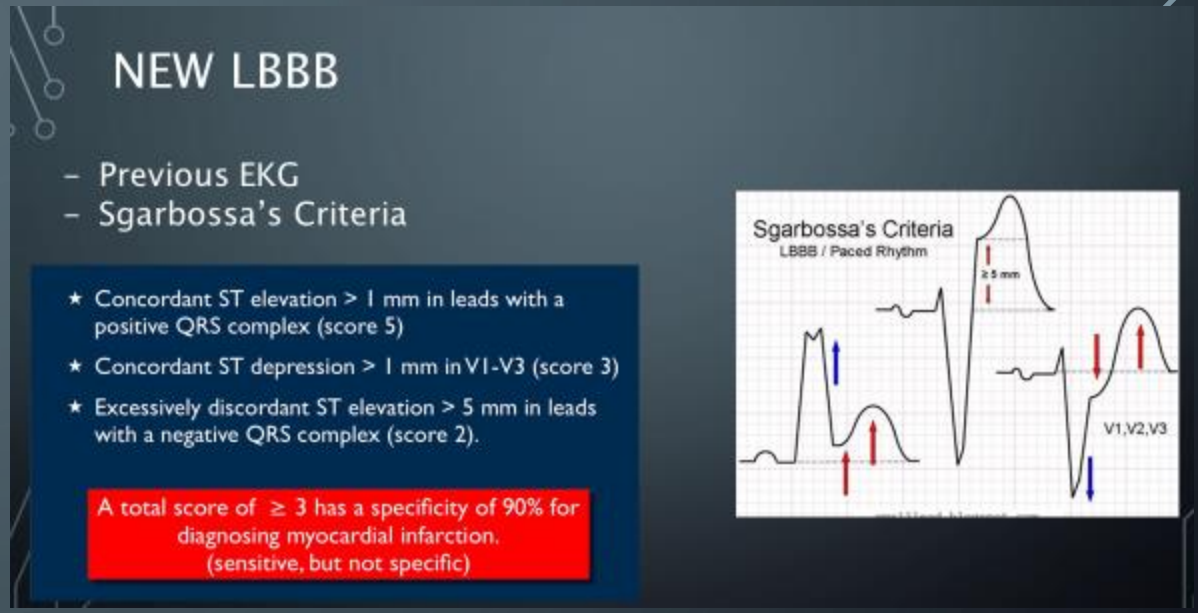
Non ST elevation

ST elevation

ST elevtion
New LBBB

- New ST elevation at J point 2 contiguous leads
  - ≥ 0.1 mV in all leads other than leads V2–V3
- In V2 & V3
  - ≥ 0.15mV in woman
  - ≥ 0.20 mV in men ≥ 40 years
  - ≥ 0.25 mV in men < 40 years

or



- Activate STEMI fast tract รพ.อุตรดิตถ์
- ASA(325) 1 tab เคี้ยว
- Clopidogrel (75) …….. Tab Oral stat
- O2 support keep O2sat >95%
- Morphine ….. Mg IV
- ทำ Right chest lead กรณี inferior wall MI
- Isordil(5) 1 tab SL (ซักประวัติ ไม่ได้ใช้ยา Viagra มาในช่วง 24 ชม.)

Clopidogrel
- อายุ < 75 ปี
  - 4tabs stat
    8 tabs หากมี

plan PCI
- อายุ > 75 ปี ไม่ต้อง Load

	Time recorder for STEMI รพ.ค่ายพิชัยดาบหัก วันที่ ..... สิทธิการรักษา.....	ชื่อ..... HN..... อายุ.....	
ลำดับ	รายการ	บันทึกเวลา	ผู้บันทึก
1	เวลาที่ผู้ป่วยเริ่มเจ็บหน้าอก		
2	เวลาที่ผู้ป่วยมาถึงโรงพยาบาล(ยื่นบัตรตรวจ)		
3	เวลาที่ผู้ป่วยมาถึงห้องฉุกเฉิน(จุดคัดกรอง)		
4	เวลาที่ผู้ป่วยได้ทำ EKG		
5	เวลาที่แพทย์เวรมาตรวจและอ่าน EKG		
6	เวลาที่แพทย์เวรสั่งการรักษาเบื้องต้น		
7	เวลาที่แพทย์เวรส่ง consult รพ.อุตรดิตถ์		
8	เวลาที่แพทย์รพ.อุตรดิตถ์สั่งการรักษา		
9	เวลาที่ refer case จากรพ.ค่ายพิชัยดาบหัก		

เป้าหมาย

อ่านผลและแปลผล EKG ภายใน 10 นาที

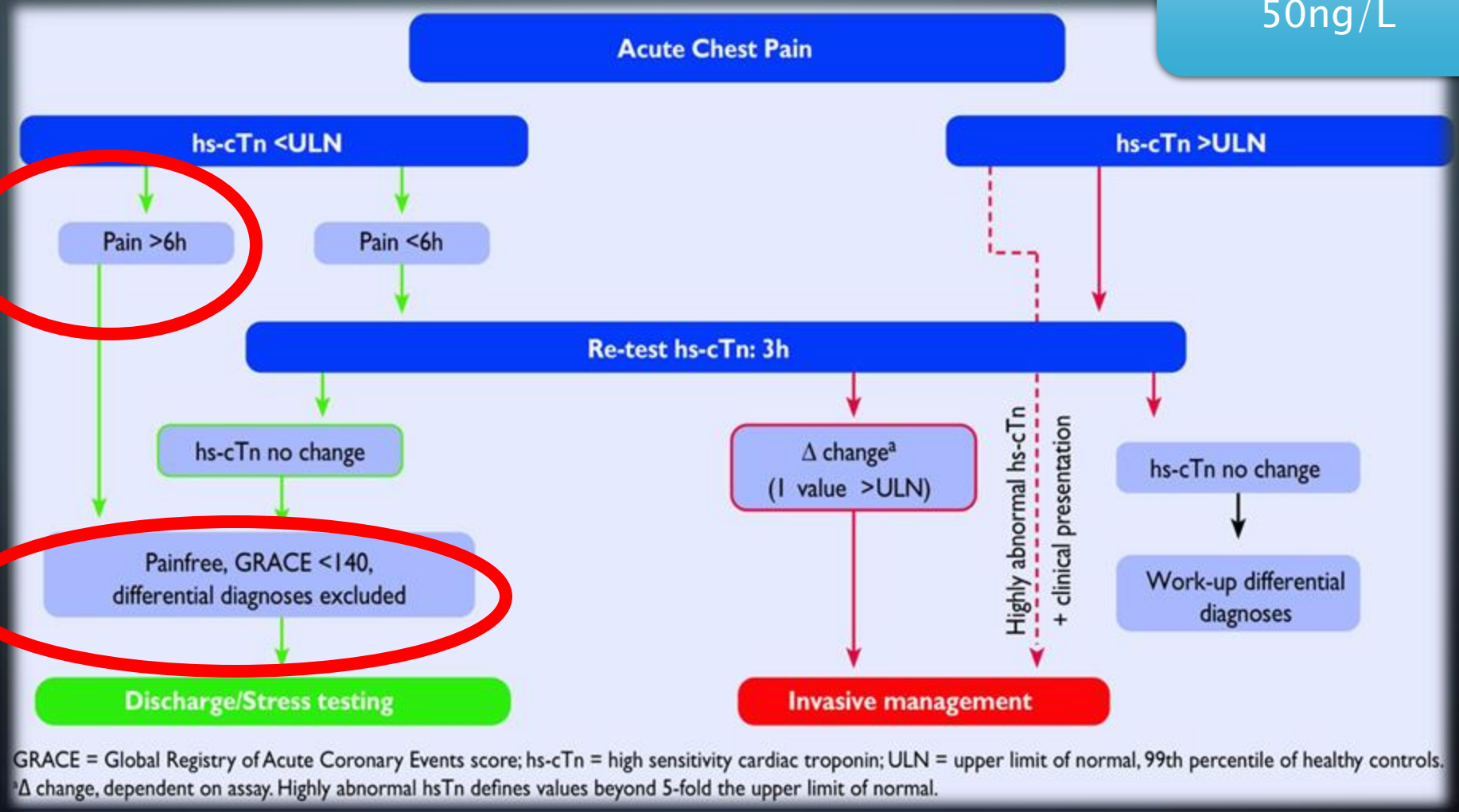
เวลาที่มาถึงรพ.ค่ายพิชัยดาบหักจนถึง refer เคส ภายใน 30 นาที

เวลาที่มาถึง ER รพ.ค่ายพิชัยดาบหักจนถึงเวลาได้รับการรักษาด้วยการสวนหัวใจภายใน 90 นาที (ภายใน 60นาที กรณี early presenter)

Non ST elevation

NON ST ELEVATION

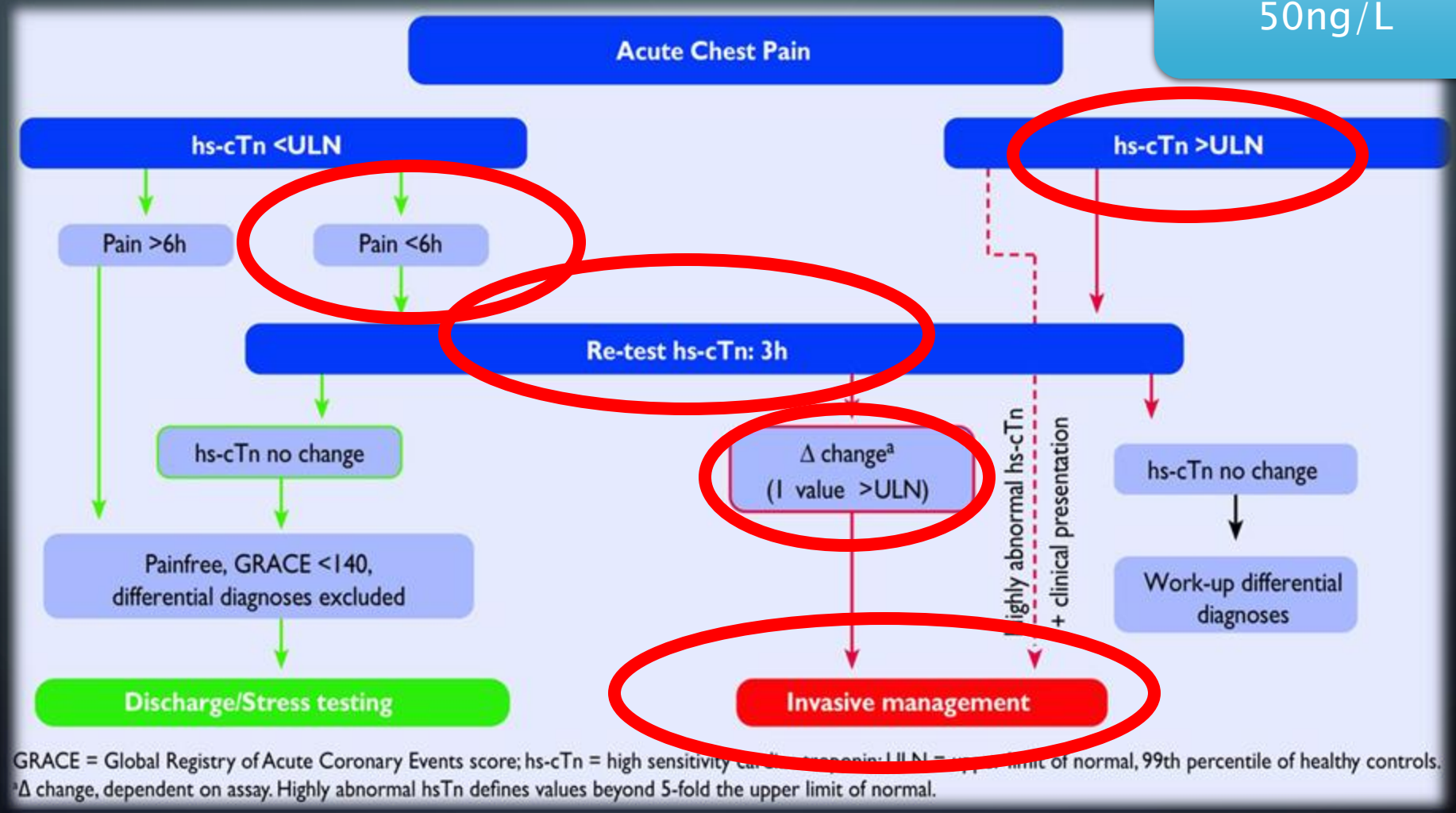
TropT > 50ng/L



GRACE = Global Registry of Acute Coronary Events score; hs-cTn = high sensitivity cardiac troponin; ULN = upper limit of normal, 99th percentile of healthy controls.
[a]Δ change, dependent on assay. Highly abnormal hsTn defines values beyond 5-fold the upper limit of normal.

NON ST ELEVATION

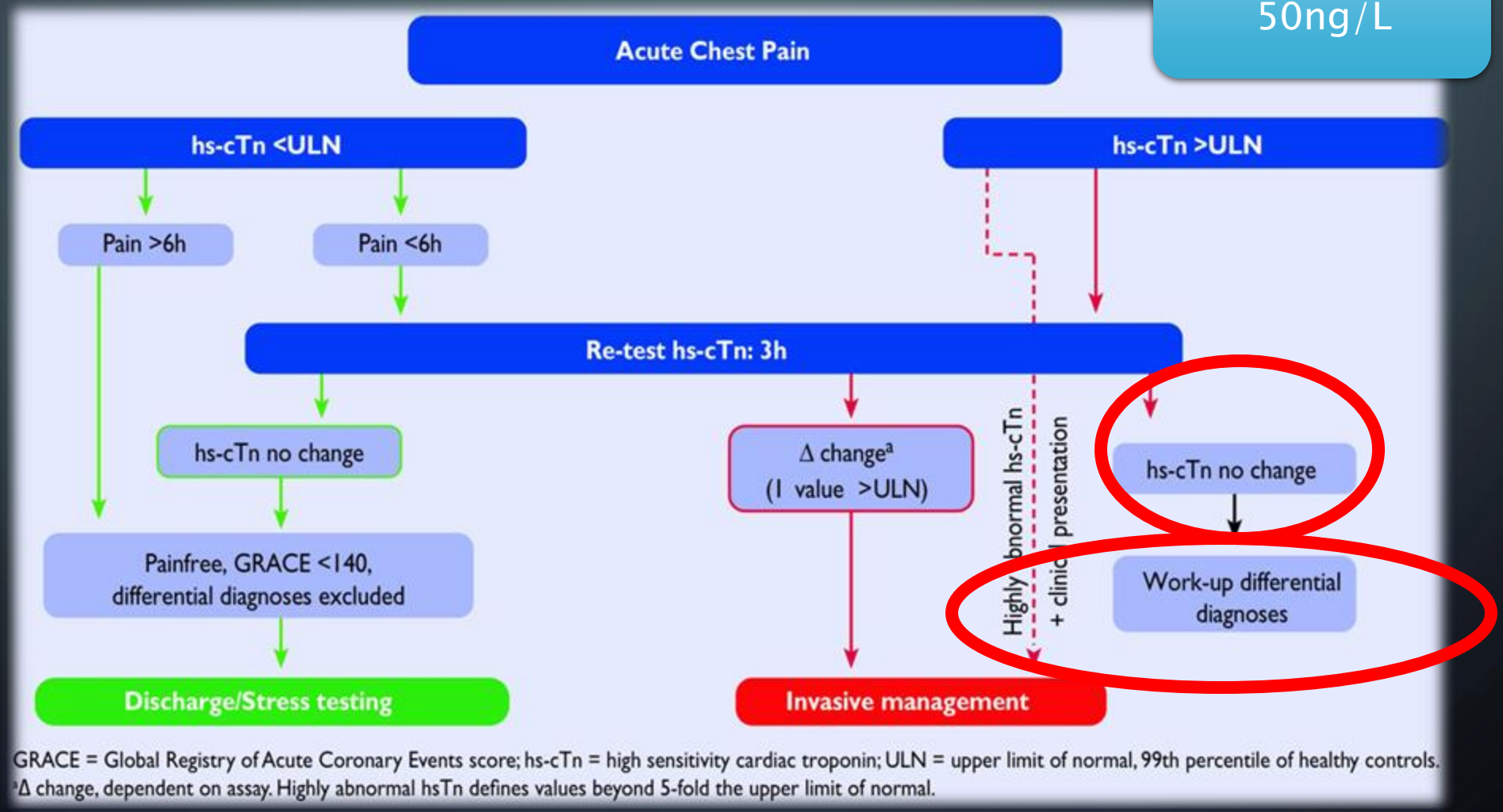
TropT > 50ng/L



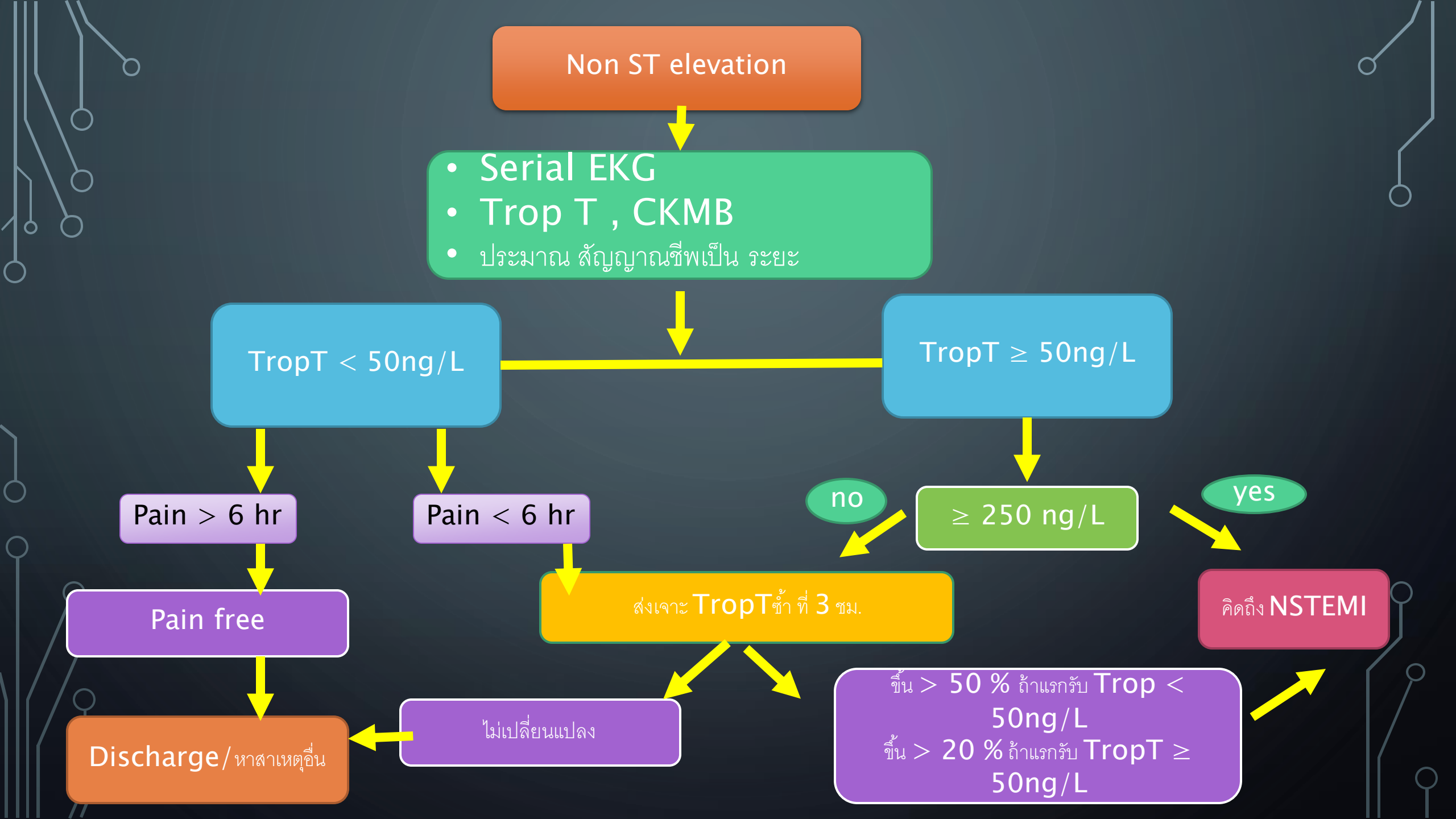
GRACE = Global Registry of Acute Coronary Events score; hs-cTn = high sensitivity [illegible] normal, 99th percentile of healthy controls.
[a]Δ change, dependent on assay. Highly abnormal hsTn defines values beyond 5-fold the upper limit of normal.

NON ST ELEVATION

TropT > 50ng/L



GRACE = Global Registry of Acute Coronary Events score; hs-cTn = high sensitivity cardiac troponin; ULN = upper limit of normal, 99th percentile of healthy controls.
[a]Δ change, dependent on assay. Highly abnormal hsTn defines values beyond 5-fold the upper limit of normal.


Non ST elevation
Serial EKG
Trop T , CKMB
ประมาณ สัญญาณชีพเป็น ระยะ
TropT < 50ng/L
TropT ≥ 50ng/L
Pain > 6 hr
Pain < 6 hr
no
≥ 250 ng/L
yes
Pain free
ส่งเจาะ TropTซ้ำ ที่ 3 ชม.
คิดถึง NSTEMI
ขึ้น > 50 % ถ้าแรกรับ Trop < 50ng/L
ขึ้น > 20 % ถ้าแรกรับ TropT ≥ 50ng/L
ไม่เปลี่ยนแปลง
Discharge/หาสาเหตุอื่น

OTHER EKGS MUST KNOWN

- **De winter EKG** (2% of anterior wall MI) Proximal LAD
  - Upslope ST depression >1mm at the J point in precordial lead
  - Tall, positive ,symmetric T wave in precordial lead
  - ST segment elevation 0.5-1mm in aVR
  - Absence of ST elevation in precordial leads

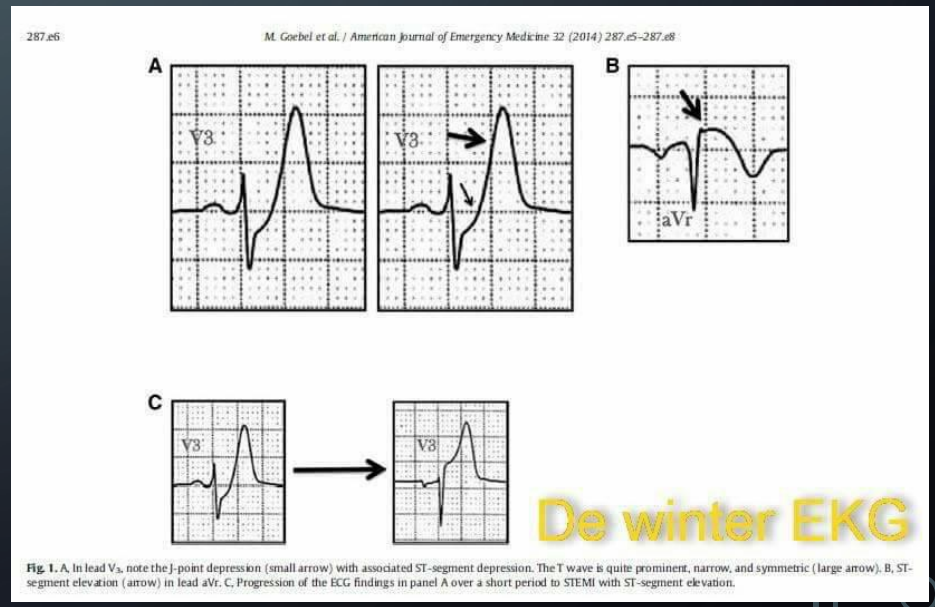


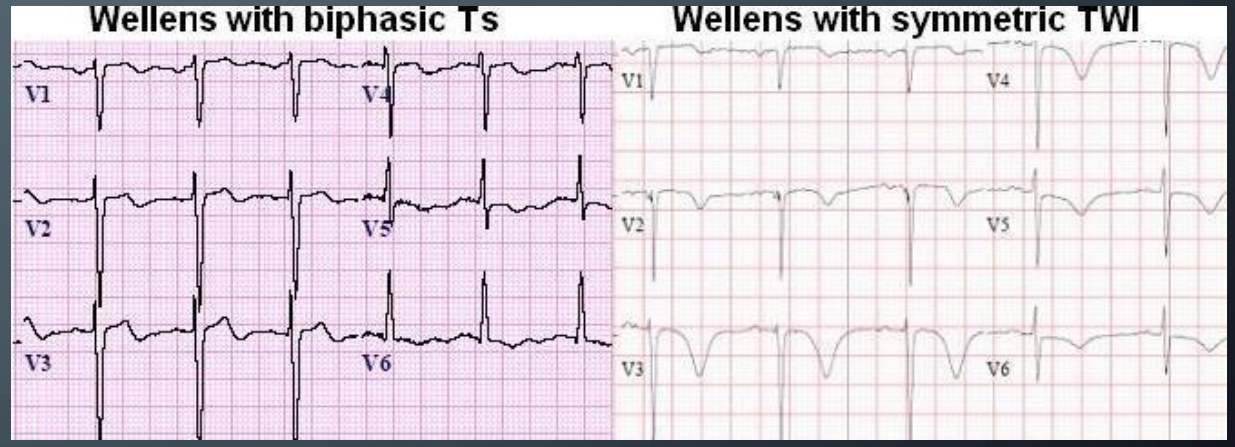
Fig. 1. A, In lead V_3, note the J-point depression (small arrow) with associated ST-segment depression. The T wave is quite prominent, narrow, and symmetric (large arrow). B, ST-segment elevation (arrow) in lead aVr. C, Progression of the ECG findings in panel A over a short period to STEMI with ST-segment elevation.

OTHER EKGS MUST KNOWN

- Wellens' syndrome : proximal LAD
- Type I
  - Biphasic T wave in Precordial lead (25%)
- Type II
  - Inverted T wave in Precordial lead (75%)

criteria

  - Deeply inverted or biphasic T wave in V2-V3
  - Isoelectric or minimally elevated ST segment
  - No precordial Q waves
  - Preserved precordial R wave progression
  - Recent history of angina
  - ECG pattern present in pain free state
  - Normal or slightly elevated serum cardiac markers

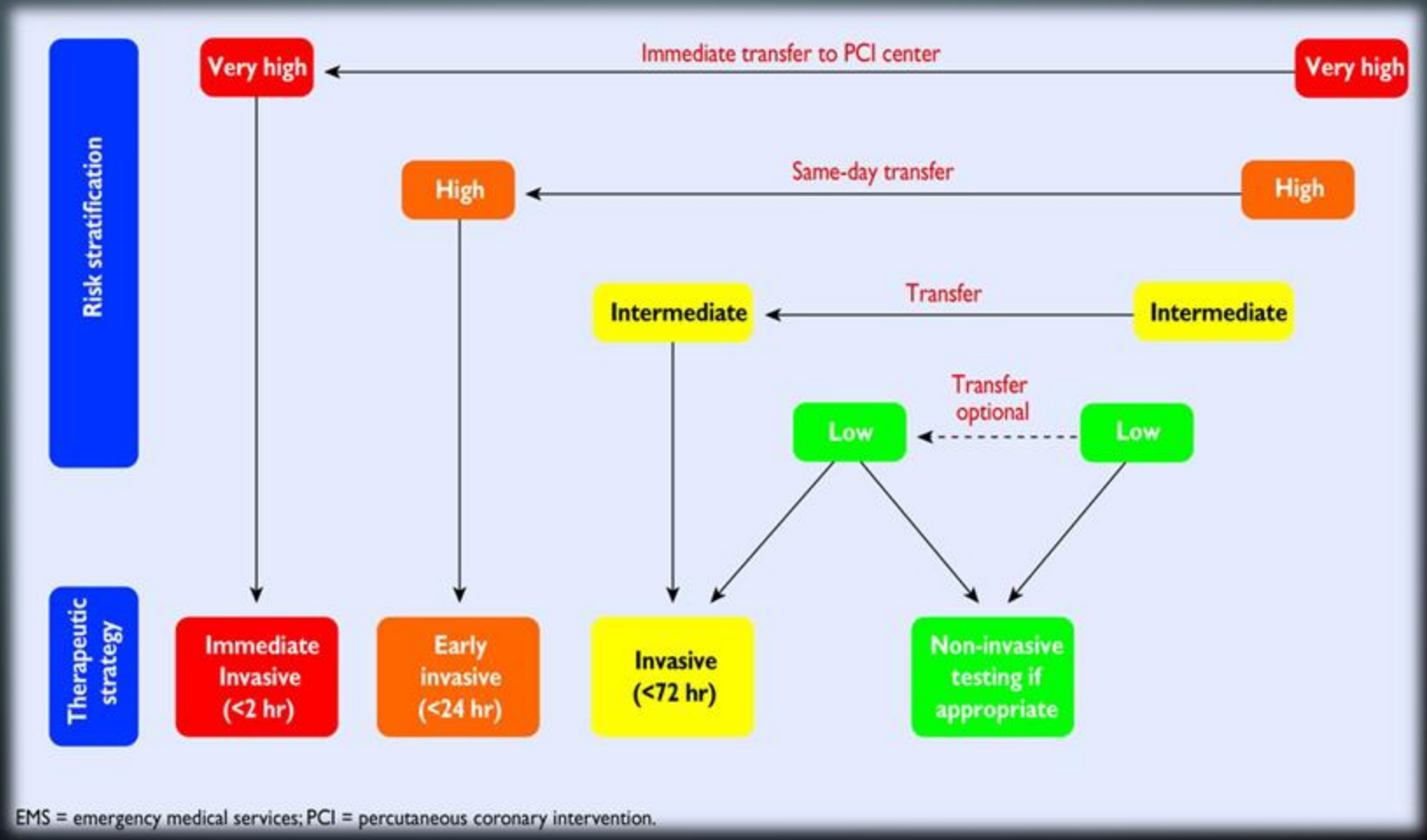


NON ST ELEVATION

- ASA (325) 1 tab oral stat
- Clopidogrel (75) 4 tab oral stat
- O2 support keep O2sat >90 %
- Isordil (5) 1 tab SL
- Monitor EKG

Very-high-risk criteria
• Haemodynamic instability or cardiogenic shock
• Recurrent or ongoing chest pain refractory to medical treatment
• Life-threatening arrhythmias or cardiac arrest
• Mechanical complications of MI
• Acute heart failure
• Recurrent dynamic ST-T wave changes, particularly with intermittent ST-elevation
High-risk criteria
• Rise or fall in cardiac troponin compatible with MI
• Dynamic ST- or T-wave changes (symptomatic or silent)
• GRACE score >140
Intermediate-risk criteria
• Diabetes mellitus
• Renal insufficiency (eGFR <60 mL/min/1.73 m^2)
• LVEF <40% or congestive heart failure
• Early post-infarction angina
• Prior PCI
• Prior CABG
• GRACE risk score >109 and <140
Low-risk criteria
• Any characteristics not mentioned above

NON ST ELEVATION



MANAGEMENT

- Aspirin 150–300 mg loading
  - Then 75–100mg /day
- Clopidogrel (75mg) 4 tabs
  - Then 75mg/day (DAPT for 12 mo)
- Anticoagulant
  - Enoxaparin
  - UFH
- Nitrate
- Beta-blocker (unless Killip ≥ III)

Drug	Recommendations		
	Normal renal function or stage 1–3 CKD (eGFR ≥30 mL/min/1.73m²)	Stage 4 CKD (eGFR 15–29 mL/min/1.73m²)	Stage 5 CKD (eGFR <15 mL/min/1.73m²)
Unfractionated heparin	• Prior to coronary angiography: 60–70 IU/kg i.v. (max 5000 IU) and infusion (12–15 IU/kg/h) (max 1000 IU/h), target aPTT 1.5–2.5x control • During PCI: 70-100 IU/kg i.v. (50–70 IU/kg if concomitant with GPIIb/IIIa inhibitors)	No dose adjustment	No dose adjustment
Enoxaparin	1 mg/kg s.c. twice a day	1 mg/kg s.c. once a day	Not recommended

4000 U
800 U/ht

MANAGEMENT (LONG TERM)

- Advise all patients on life style change
- Start high intensity statin
- ACEI/ARB is recommended in patient LVEF <40%,HT,DM
- Mineralocorticoid antagonist in LVEF<35% + HF/DM
- DBP < 90
- SBP < 140
- Cardiac rehab program

WARINING!!

Table 6 Differential diagnoses of acute coronary syndromes in the setting of acute chest pain

Cardiac	Pulmonary	Vascular	Gastro-intestinal	Orthopaedic	Other
Myopericarditis Cardiomyopathies[a]	**Pulmonary embolism**	**Aortic dissection**	**Oesophagitis, reflus or spasm**	**Musculoskeletal disorders**	**Anxiety disorders**
Tachyarrhythmias	**(Tension)-Pneumothorax**	Symptomatic aortic aneurysm	Peptic ulcer, gastritis	Chest trauma	Herpes zoster
Acute heart failure	Bronchitis, pneumonia	Stroke	Pancreatitis	Muscle injury/ inflammation	Anaemia
Hypertensive emergencies	Pleuritis		Cholecystitis	Costochondritis	
Aortic valve stenosis				Cervical spine pathologies	
Tako-Tsubo cardiomyopathy					
Coronary spasm					
Cardiac trauma					

WARINING!!

- Differential diagnosis must be done!!!
- Nitrate : symptom control
  - Blood pressure monitoring
  - Right chest leads EKG in case presented with Inferior
  - History taking!!


THANK
YOU