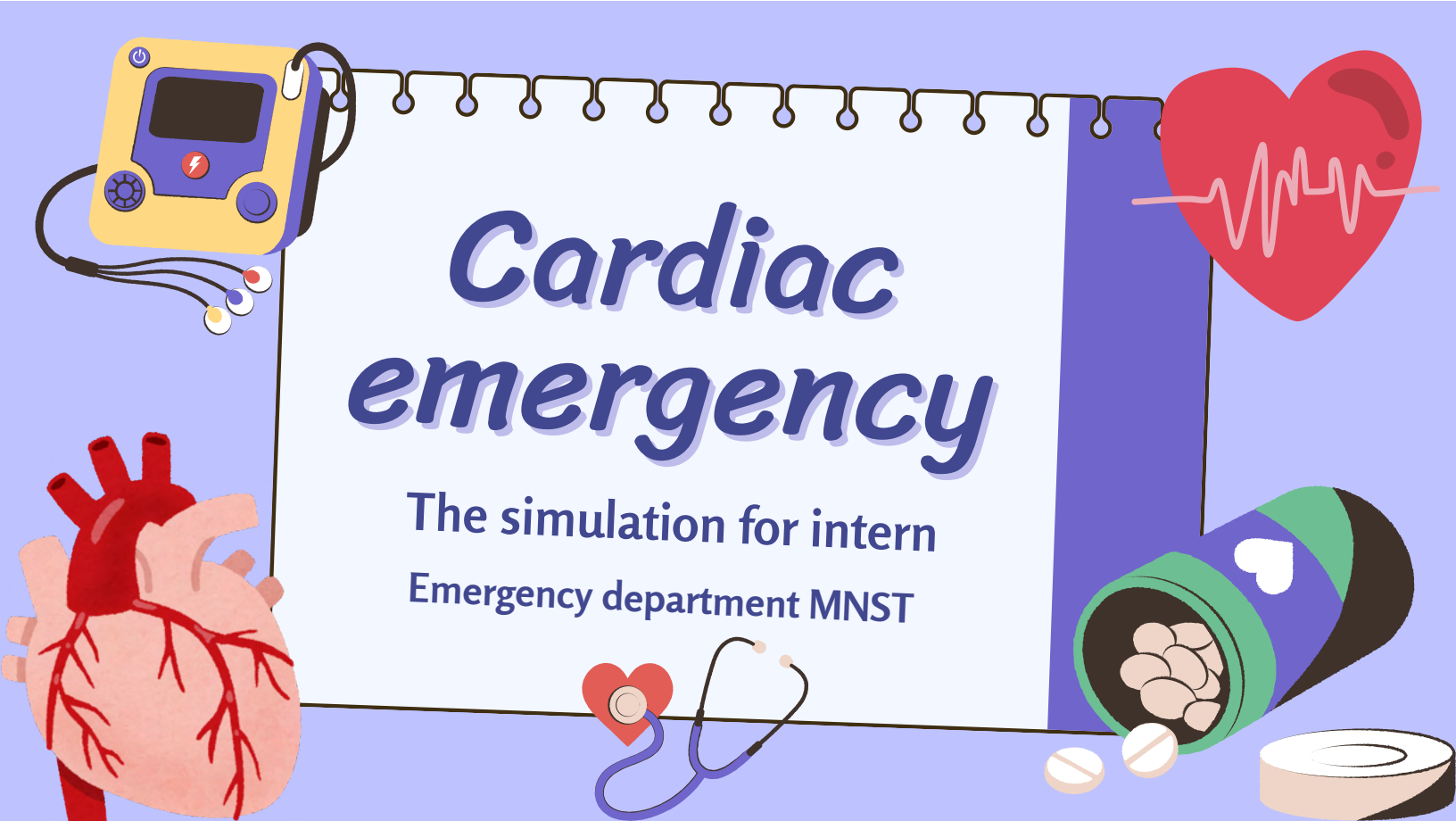


The background is a light blue gradient. At the top left is a yellow and blue defibrillator with black cables and three colored pads (red, white, yellow). At the top right is a red heart with a white ECG line passing through it. At the bottom left is a detailed anatomical illustration of a human heart. At the bottom center is a blue stethoscope with a red heart on its chest piece. At the bottom right is a blue and green pill bottle lying on its side, spilling several white, oval-shaped pills. Next to the pills is a roll of white medical tape.

Cardiac emergency

The simulation for intern
Emergency department MNST

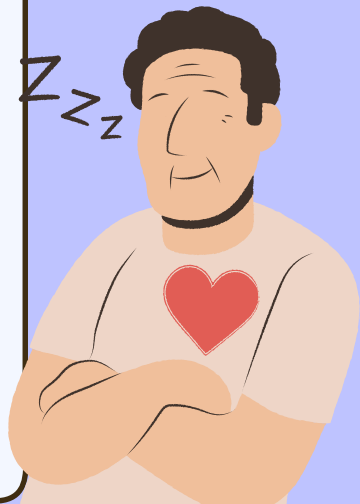
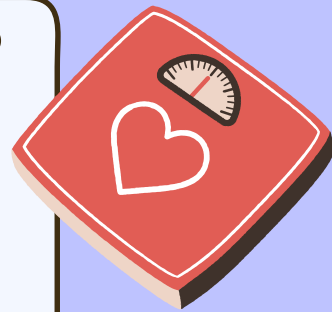
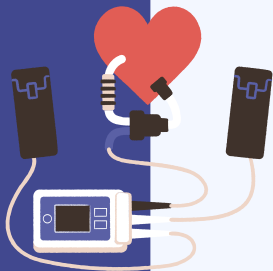


Case 1

ผู้ชาย 65 ปี

DM HT smoking 10 มวน/วัน 40 ปี
เจ็บแน่นหน้าอก เหงื่อแตกใจสั่น 1 ชั่วโมง

V/S : temp 36 BP 145/82 HR 40 RR 22
SpO2 97%





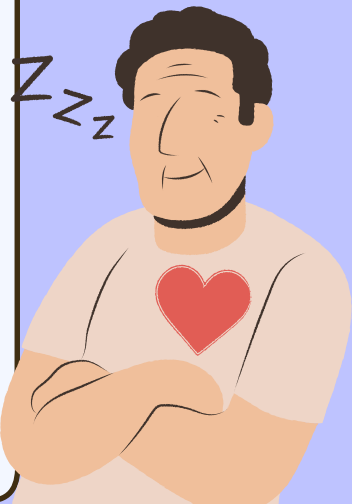
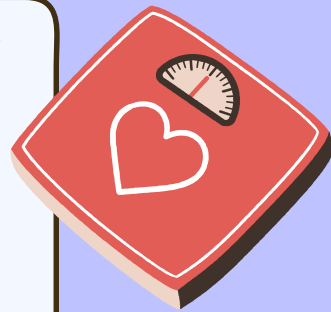
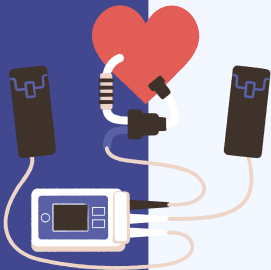
Case 2

ผู้หญิง 55 ปี

ESRD on HD จ พ ศ

ไม่ได้ไป HD มา 2 ครั้ง เพราะเพลีย
มาด้วยใจสั่น 2 ชั่วโมงก่อนมาโรงพยาบาล

V/S : temp 37.2 BP 168/90 HR 120 RR 24
SpO2 95%

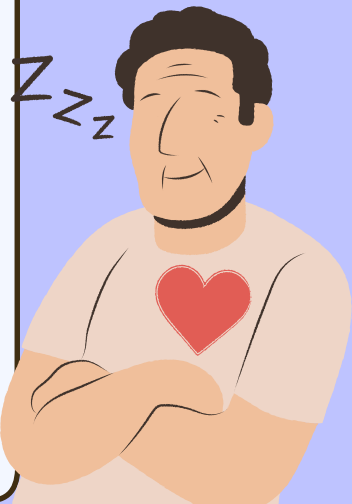
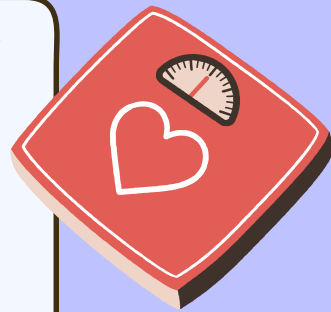
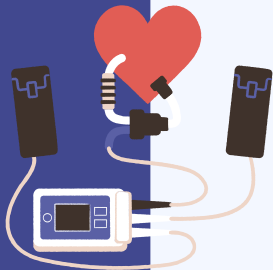




Case 3

ผู้ชาย 78 ปี
ไม่มีโรคประจำตัว
มาด้วยเจ็บหน้าอก เหนื่อยมาก
1 ชั่วโมงก่อนมาโรงพยาบาล

V/S : temp 37 BP 170/110 HR 100 RR 40
SpO2 80%



Case 4

ผู้ชาย 17 ปี

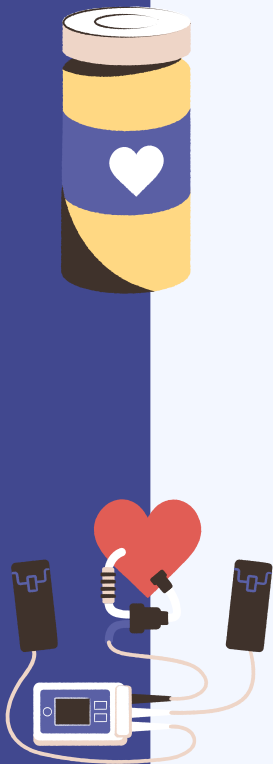
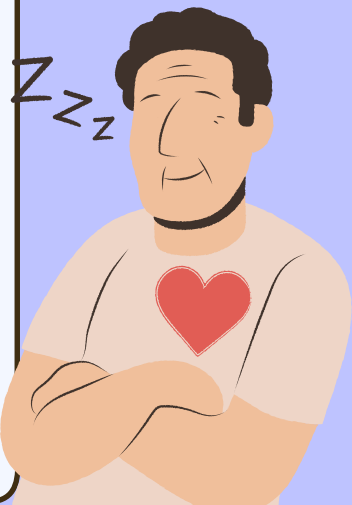
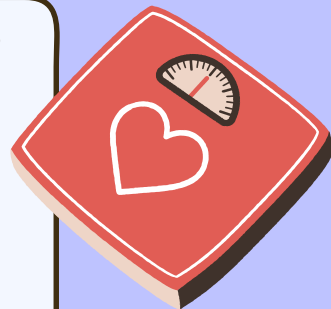
U/D MDD รักษาคลินิก

วันนี้ทะเลาะกับแฟน กินยาไม่ทราบชื่อ 40

เม็ด 30 นาทีก่อนมา sw

มีอาการใจสั่น

V/S : temp 37 BP 150/100 HR 130 RR 26
SpO2 98%



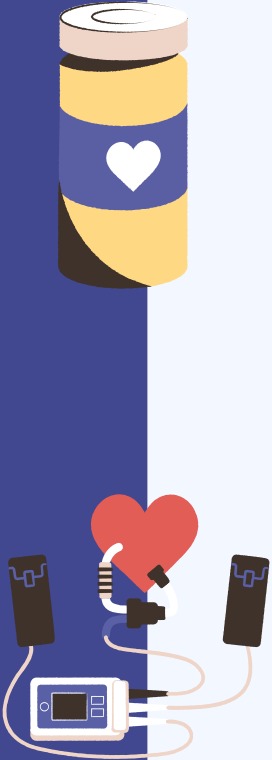
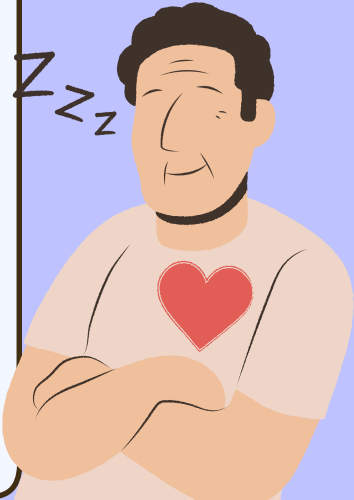
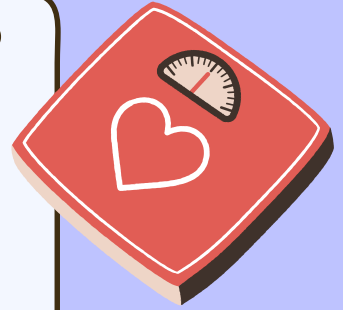
Case 1

How to read EKG STEMI

Inferior wall STEMI

Management STEMI

Bradycardia algorithm



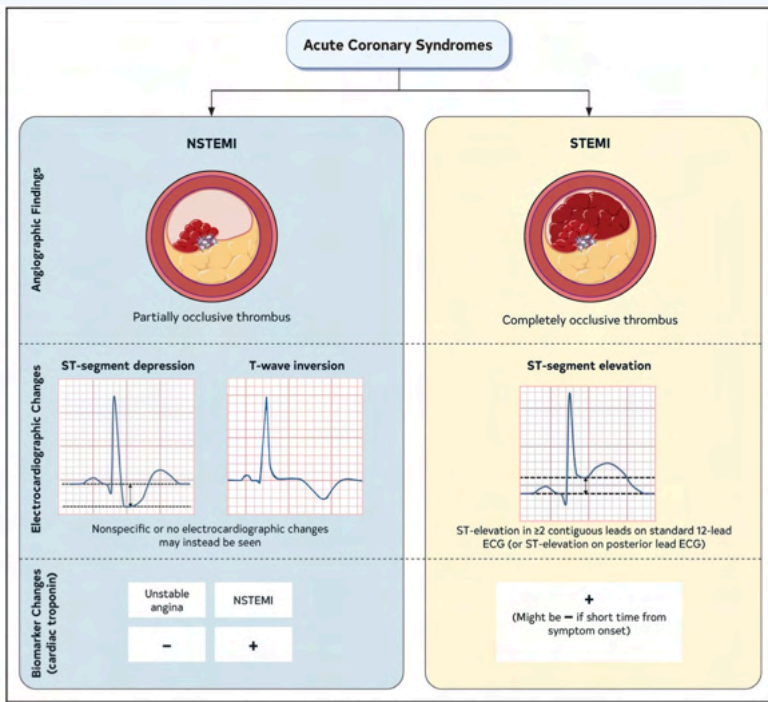
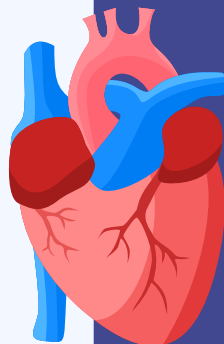


Figure 2. Types and Classification of Acute Coronary Syndromes.

NSTEMI indicates non-ST-segment elevation myocardial infarction; and STEMI, ST-segment elevation myocardial infarction.

Illustration by Patrick Lane, ScEYence Studios. Copyright 2025 American College of Cardiology Foundation, and the American Heart Association, Inc.



STEMI criteria

Table 3. Electrocardiographic Interpretation for Patients With Suspected Acute Coronary Syndromes

	NSTE-ACS	STEMI
Electrocardiographic evidence of ischemia	New or presumed new and usually dynamic horizontal or down-sloping ST-segment depression ≥ 0.5 mm in ≥ 2 contiguous leads and/or T-wave inversion >1 mm in ≥ 2 contiguous leads with prominent R wave or R/S ratio >1 or transient ST-segment elevation.	New or presumed new ST-elevation of ≥ 1 mm in ≥ 2 anatomically contiguous leads (measured at the J-point) in all leads other than V2-V3 and ≥ 2 mm in men ≥ 40 y, ≥ 2.5 mm in men <40 y, and ≥ 1.5 mm in women regardless of age in leads V2-V3*.
Other observed electrocardiographic changes	Many patients with NSTE-ACS have either nonspecific ST-segment or T-wave changes or a normal ECG. The absence of electrocardiographic evidence of ischemia does not exclude ACS.	Posterior leads (V7-V9) should be obtained in patients with suspected left circumflex occlusion particularly in the setting of isolated ST-segment depression ≥ 0.5 mm in leads V1-V3.

Adapted with permission from Thygesen et al.⁴ Copyright 2018 The European Society of Cardiology, American College of Cardiology Foundation, American Heart Association, Inc., and the World Heart Federation. Adapted from Kontos et al.¹¹ Copyright 2022 American College of Cardiology Foundation.

*ST-segment changes may be observed in other conditions including acute pericarditis, left ventricular hypertrophy, LBBB, Brugada syndrome, right ventricular pacing, Takotsubo syndrome, and early repolarization that may obscure the diagnosis of STEMI.¹² New or presumably new LBBB at presentation occurs infrequently and should not be considered diagnostic of AMI in isolation; clinical correlation is required.¹³ A new LBBB in an asymptomatic patient does not constitute a STEMI equivalent.¹¹

ACS indicates acute coronary syndromes; AMI, acute myocardial infarction; LBBB, left bundle branch block; NSTE-ACS, non-ST-segment elevation ACS; and STEMI, ST-segment elevation MI.

STEMI : ยก 1 ช่อง

ยกเว้น **V2-V3** ให้ดูเพศกับอายุ

หญิง : **1.5** ช่อง

ชายแก่ **> 40 : 2** ช่อง

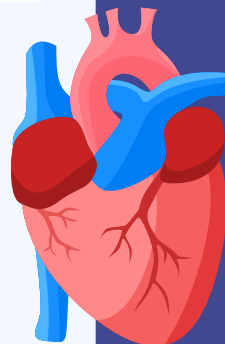
ชายเด็ก **< 40 : 2.5** ช่อง

Posterior wall **V7-9 : 0.5** ช่อง

NSTE-ACS :

STD **0.5** ช่อง

TWI **1** ช่อง



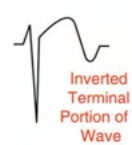
STEMI EKG

ECG Evolution

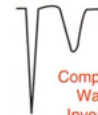
Hyperacute T Wave



ST Elevation

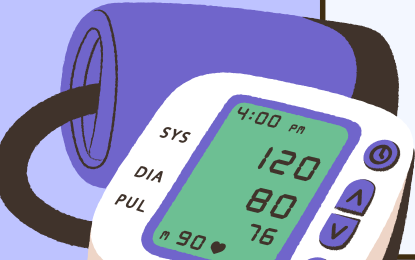
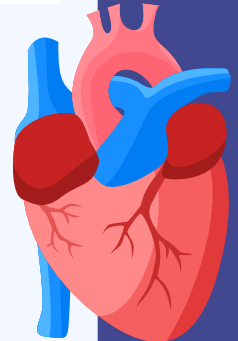


Q wave

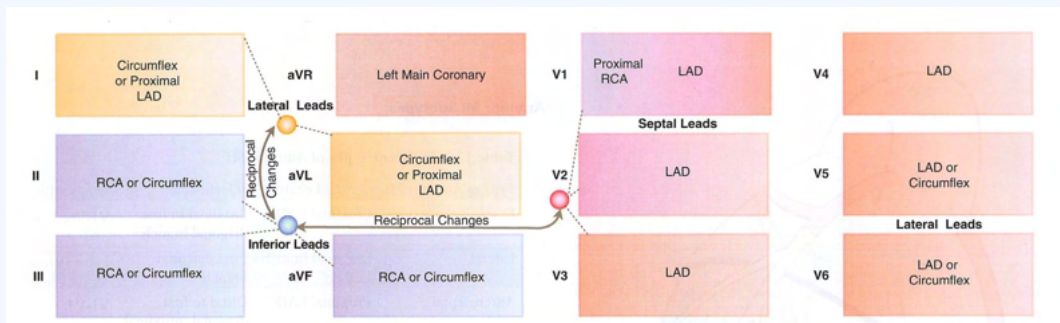


Complete T Wave Inversion

FIGURE 12.6 Progression of ECG changes in MI.



STEMI EKG



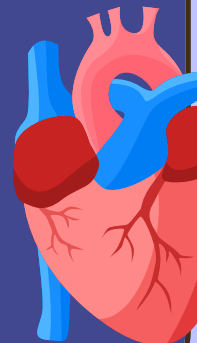
Reciprocal STD

Anterior → Inferior

Inferior → Lateral

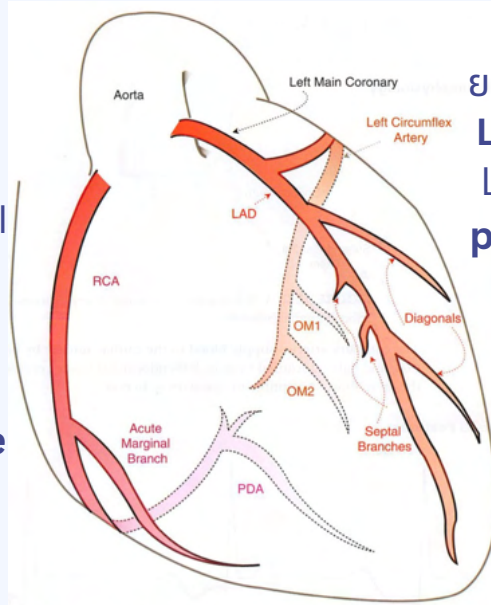
Lateral → Inferior

Posterior → STD V1-V3



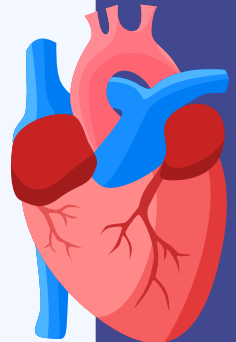
Inferior wall STEMI

ຍກ lead III > II
RCA
RCA ເລັ່ຍ
posterior,
RV, AV node



ຍກ lead II > III
LCx
LCx ເລັ່ຍ
posterior
wall

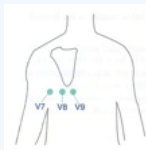
FIGURE 12.1 Simplified diagram of the coronary arteries and their branches depicted from an anterior view of a heart with right-dominant circulation.



Inferior wall STEMI

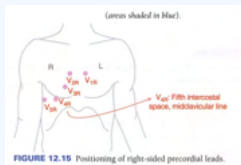
STE II, III, aVF
reciprocal STD I, aVL

STD V1-V3



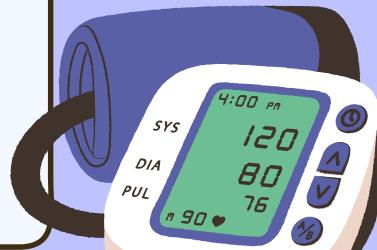
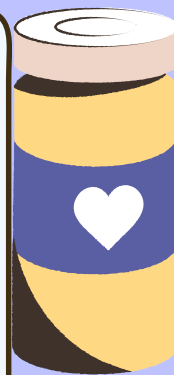
STE V7-V9
**Posterior
wall STEMI**

STE V1

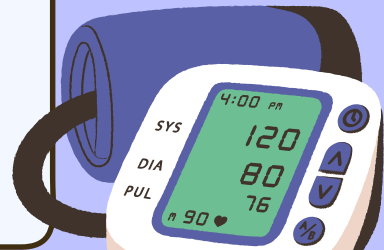
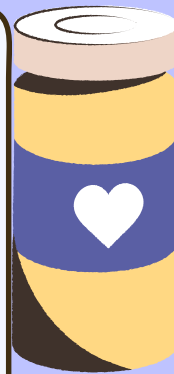
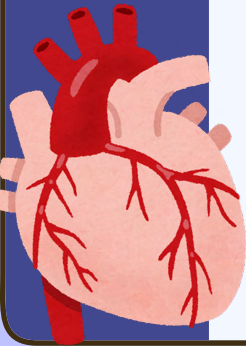
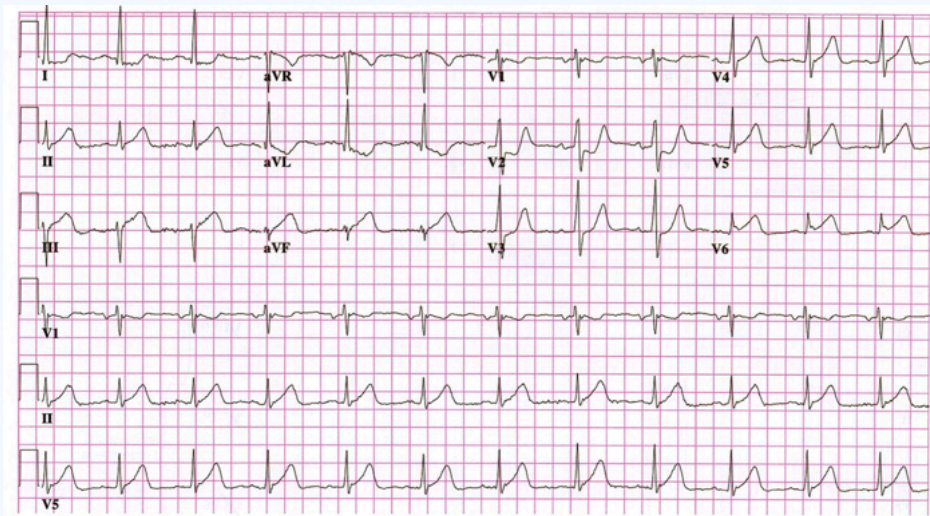


STE V3R, V4R
RV infarction

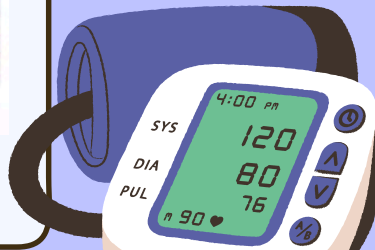
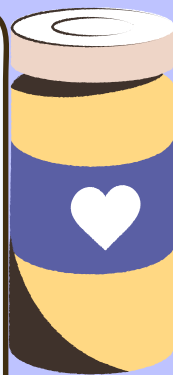
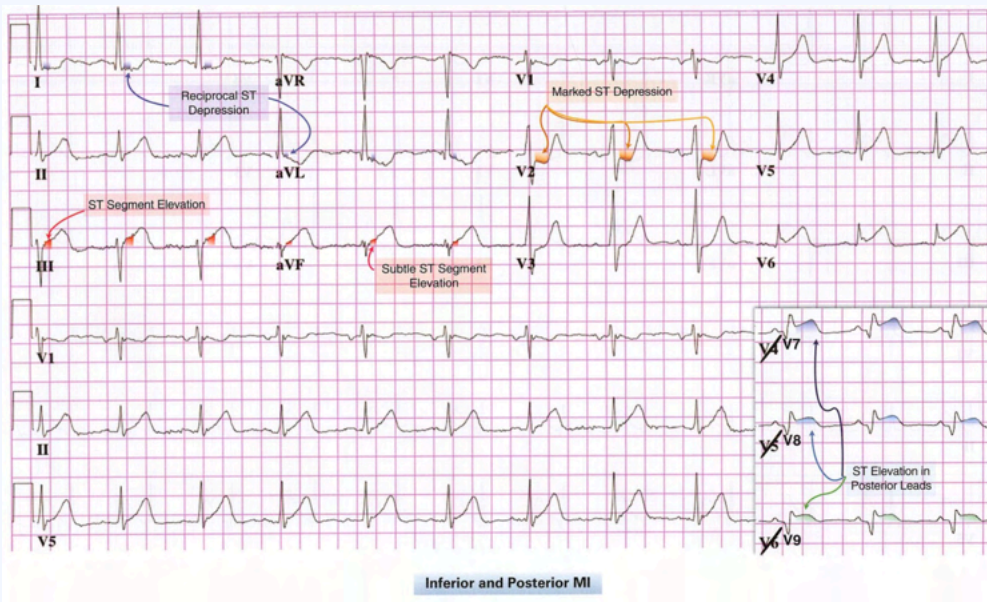
AV block

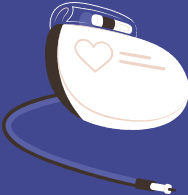


Inferior wall STEMI



Inferior wall STEMI





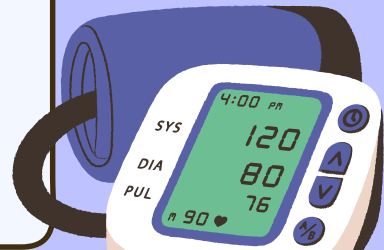
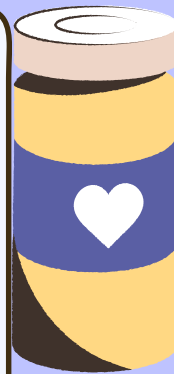
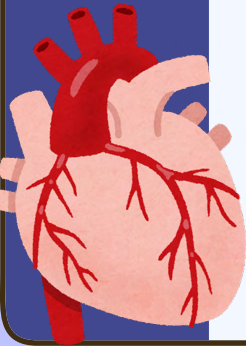
Management STEMI

Circulation

CLINICAL PRACTICE GUIDELINES

2025 ACC/AHA/ACEP/NAEMSP/SCAI
Guideline for the Management of Patients
With Acute Coronary Syndromes: A Report of
the American College of Cardiology/American
Heart Association Joint Committee on Clinical
Practice Guidelines

AHA 2025 ACS guidelines



Management STEMI

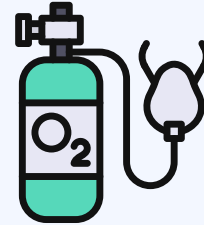
4. STANDARD MEDICAL THERAPIES FOR STEMI AND NSTEMI-ACS

4.1. Oxygen Therapy

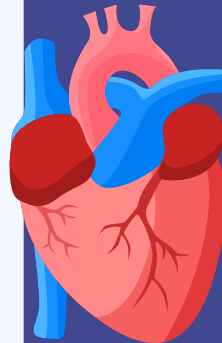
Recommendations for Oxygen Therapy

Referenced studies that support recommendations are summarized in the Evidence Table.

COR	LOE	Recommendations
1	C-LD	1. In patients with ACS and confirmed hypoxia (oxygen saturation <90%), supplemental oxygen to increase oxygen saturations to ≥90% is recommended to improve myocardial oxygen supply and decrease anginal symptoms. ¹
3: No Benefit	A	2. In patients with ACS and oxygen saturations ≥90%, routine administration of supplemental oxygen is not recommended because it does not improve cardiovascular outcomes. ²⁻⁴



90%



Management STEMI

Table 7. Dosing Considerations for Oral Antiplatelet Therapy in Patients With ACS

Agent	Setting	Dosing Considerations
Aspirin	NSTE-ACS or STEMI	Loading dose 162-325 mg orally. Aspirin (nonenteric coated) should be chewed, when possible, to achieve faster onset of antiplatelet action. Loading dose should be administered for patients already on aspirin therapy. Maintenance dose 75-100 mg orally daily (nonenteric coated)
Clopidogrel	NSTE-ACS or STEMI without fibrinolytic	Loading dose 300 or 600 mg orally Maintenance 75 mg orally daily
	STEMI with fibrinolytic	Loading dose 300 mg orally if age ≤ 75 y; Initial dose 75 mg orally if age > 75 y Maintenance 75 mg orally daily
Prasugrel	NSTE-ACS or STEMI without fibrinolytic, and undergoing PCI	Loading dose 60 mg orally Maintenance dose 10 mg orally daily if body weight ≥ 60 kg and age < 75 y Maintenance dose 5 mg orally daily if body weight < 60 kg or age ≥ 75 y (use caution)
Ticagrelor	NSTE-ACS or STEMI without fibrinolytic	Loading dose 180 mg orally Maintenance dose 90 mg orally twice daily

NSTE-ACS indicates non-ST-segment elevation acute coronary syndromes; PCI, percutaneous coronary intervention; and STEMI, ST-segment elevation myocardial infarction.

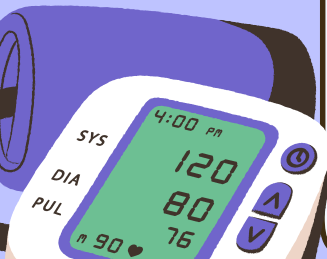
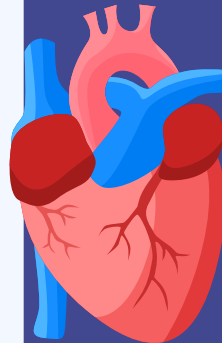
Clopidogrel **8** tab : STEMI with PCI

Clopidogrel **1** tab : STEMI with fibrinolytic with age > 75

Clopidogrel **4** tab : NSTE-ACS

STEMI with fibrinolytic with age < 75

P2Y₁₂
receptor
inhibitor

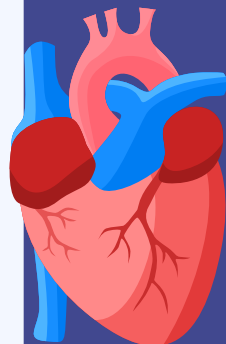


Management STEMI

Table 10. Dosing of Parenteral Anticoagulation in ACS

Drug	Dosing
UFH	Initial therapy: Loading dose 60 IU/kg (max 4000 IU), with initial infusion 12 IU/kg per h (max 1000 IU/h) adjusted to therapeutic aPTT range of 60-80 s. To support PCI: In patients who have received prior anticoagulant therapy, additional UFH as needed to achieve an ACT 250-300 s. In patients who have not received prior anticoagulant therapy, 70-100 U/kg initial bolus to achieve target ACT of 250-300 s. With fibrinolytic therapy: Loading dose 60 IU/kg (maximum 4000 IU) with initial infusion 12 IU/kg per h (maximum 1000 IU/h) adjusted to therapeutic aPTT range.
Bivalirudin	To support PCI: 0.75 mg/kg bolus, 1.75 mg/kg per h IV infusion during the PCI procedure. Post-PCI infusion for PPCI: 1.75 mg/kg per h for 2-4 h post-PCI. In patients with CrCl <30 mL/min, reduced infusion to 1 mg/kg per h.
Enoxaparin	Initial therapy: 1 mg/kg subcutaneous every 12 h. Reduce dose to 1 mg/kg per d subcutaneous if CrCl <30 mL/min. To support PCI: For previous treatment with enoxaparin, if the last subcutaneous dose was administered 8-12 h earlier or if only 1 subcutaneous dose of enoxaparin has been administered, an IV dose of 0.3 mg of enoxaparin should be given. If the last dose was administered within the previous 8 h, no additional enoxaparin should be given. For patients who have not received prior anticoagulant therapy, 0.5-0.75 mg/kg IV bolus. With fibrinolytic therapy: If age <75 y, 30 mg IV bolus, followed in 15 min by 1 mg/kg subcutaneous every 12 h (maximum 100 mg for the first 2 doses). If age ≥75 y: no bolus, 0.75 mg/kg subcutaneous every 12 h (maximum 75 mg for the first 2 doses). Regardless of age, if CrCl <30 mL/min: 1 mg/kg subcutaneous every 24 h.
Fondaparinux	Initial therapy: 2.5 mg subcutaneous daily. With fibrinolytic therapy: 2.5 mg IV, then 2.5 mg subcutaneous daily starting the following day. Contraindicated if CrCl <30 mL/min. Fondaparinux should not be used to support PCI because of the risk of catheter thrombosis.

ACS indicates acute coronary syndromes; ACT, activated clotting time; aPTT, activated partial thromboplastin time; CrCl, creatinine clearance; PCI, percutaneous coronary intervention; PPCI, primary percutaneous coronary intervention; and UFH, unfractionated heparin.



Management STEMI

Table 6. Analgesic Treatment Options for Cardiac Chest Pain

Medication	Route	Suggested Dosing	Considerations
Nitroglycerin*	SL (tablets, spray)	0.3 or 0.4 mg every 5 min as needed up to a total of 3 doses	Use in hemodynamically stable patients with SBP ≥ 90 mm Hg.
Nitroglycerin*	IV	Start at 10 μ g/min and titrate to pain relief and hemodynamic tolerability.	Consider for persistent anginal pain after oral nitrate therapy, or if ACS is accompanied by hypertension or pulmonary edema. ²⁰⁻²² Avoid use in suspected RV infarction, SBP < 90 mm Hg or a change in SBP > 30 mm Hg below baseline. Tachyphylaxis may occur after approximately 24 h.
Morphine	IV	2-4 mg; may repeat if needed every 5-15 min. Doses up to 10 mg may be considered.	Use for relief of pain that is resistant to other maximally tolerated anti-ischemic medications. May delay the effects of oral P2Y12 therapy. ²⁹⁻³² Monitor closely for adverse effects.
Fentanyl	IV	25-50 μ g; may repeat if needed. Doses up to 100 μ g may be considered.	Use for relief of pain that is resistant to other maximally tolerated anti-ischemic medications. May delay the effects of oral P2Y12 therapy. ⁸ Monitor closely for adverse effects.

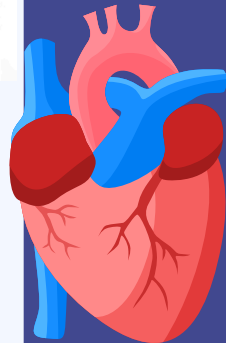
*Nitrates should not be administered after recent PDE5 inhibitor use. Avoid use of nitrates/nitroglycerin within 12 h of avanafil, 24 h of sildenafil/vardenafil, or 48 h of tadalafil.²⁹⁻³⁵

ACS indicates acute coronary syndromes; PDE5, phosphodiesterase-5 inhibitor; RV, right ventricular; SBP, systolic blood pressure; and SL, sublingual.

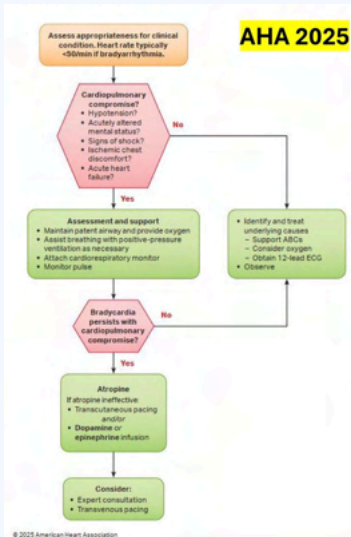
Isodil SL : if hypertension or heart failure

NTG IV : if hypertension or heart failure

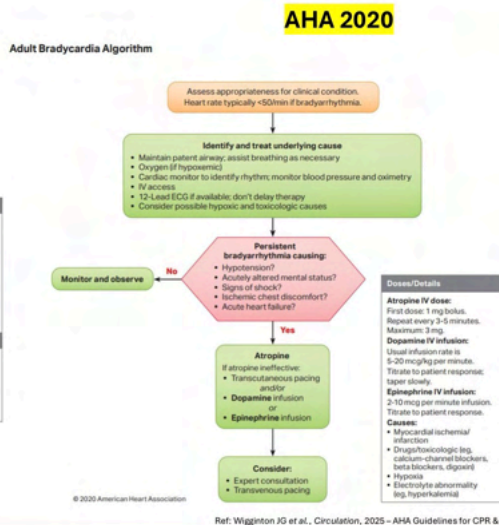
Isodil SL/NTG IV : caution !! Hypotension, RV infarction, PDE5 inhibitors (Sildenafil)



Bradycardia algorithm

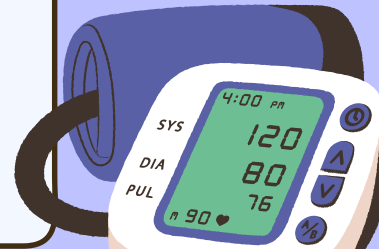
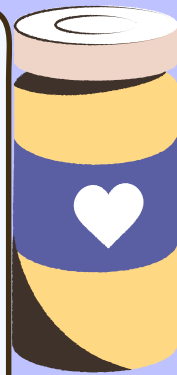
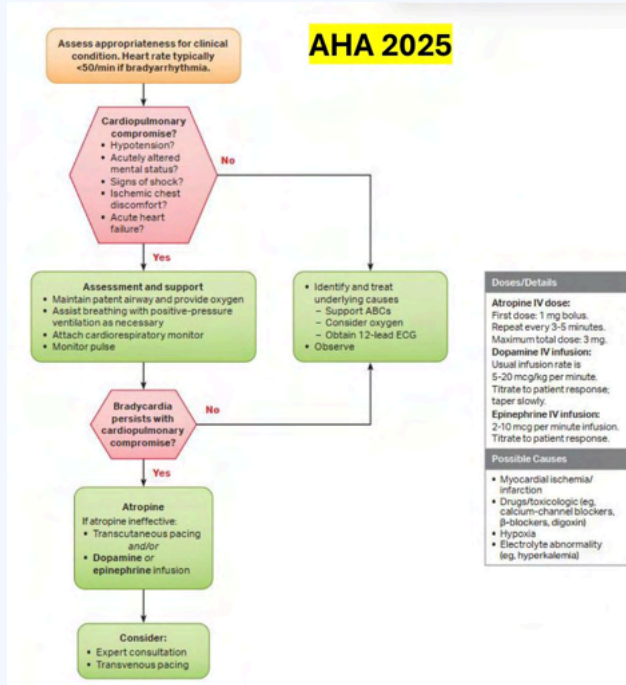


Doses/Details
Atropine IV dose: First dose: 1 mg bolus. Repeat every 3-5 minutes. Maximum total dose: 3 mg. Dopamine IV infusion: Usual infusion rate is 5-20 mcg/kg per minute. Titrate to patient response; taper slowly. Epinephrine IV infusion: 2-10 mcg per minute infusion. Titrate to patient response.
Possible Causes
- Myocardial ischemia/infarction - Drugs/toxicologic (eg, calcium-channel blockers, beta-blockers, digoxin) - Hypoxia - Electrolyte abnormality (eg, hyperkalemia)



Doses/Details
Atropine IV dose: First dose: 1 mg bolus. Repeat every 3-5 minutes. Maximum: 3 mg. Dopamine IV infusion: Usual infusion rate is 5-20 mcg/kg per minute. Titrate to patient response; taper slowly. Epinephrine IV infusion: 2-10 mcg per minute infusion. Titrate to patient response.
Causes: - Myocardial ischemia/infarction - Drugs/toxicologic (eg, calcium-channel blockers, beta-blockers, digoxin) - Hypoxia - Electrolyte abnormality (eg, hyperkalemia)

Bradycardia algorithm



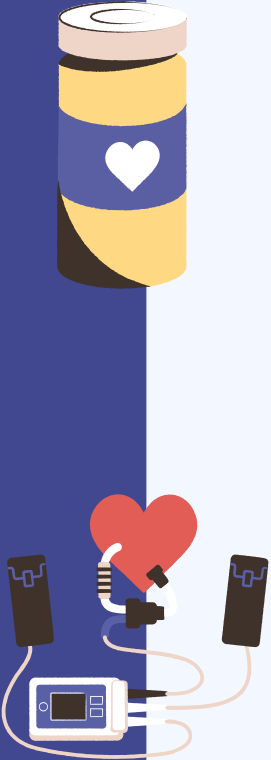
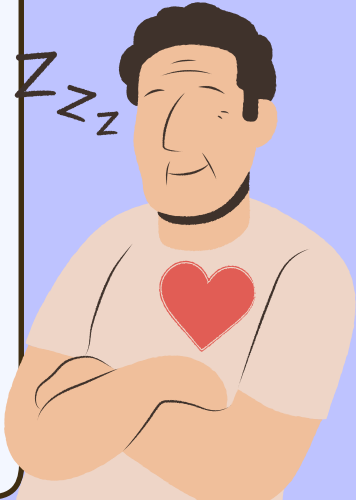
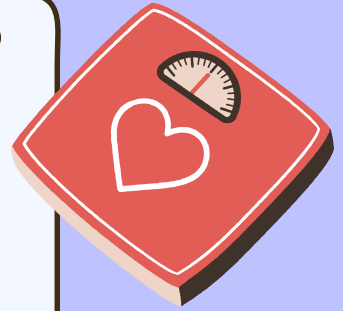
Case 2

EKG mimic STEMI

Tachycardia algorithm

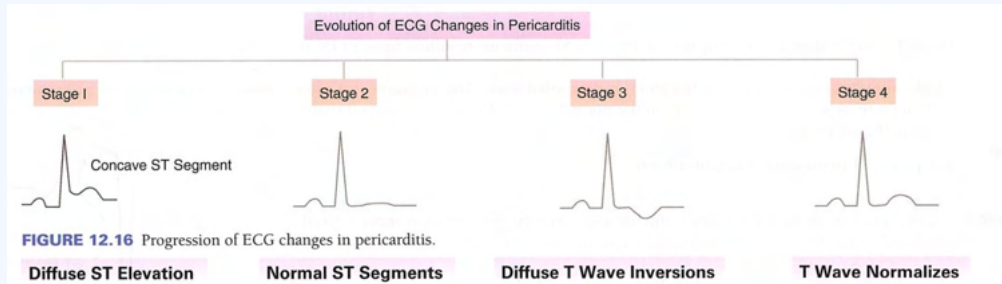
Synchronized cardioversion

Hyperkalemia treatment

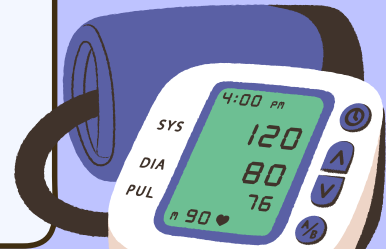
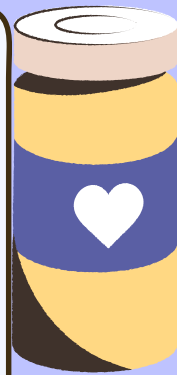
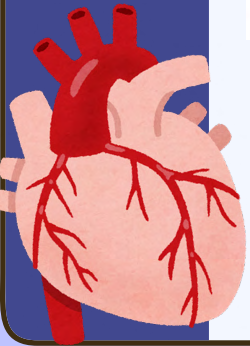


EKG mimic STEMI

Pericarditis



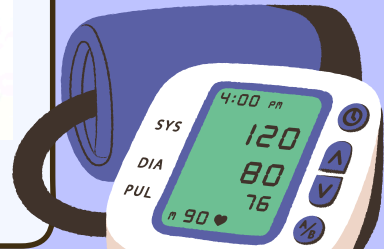
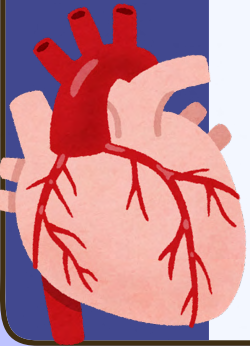
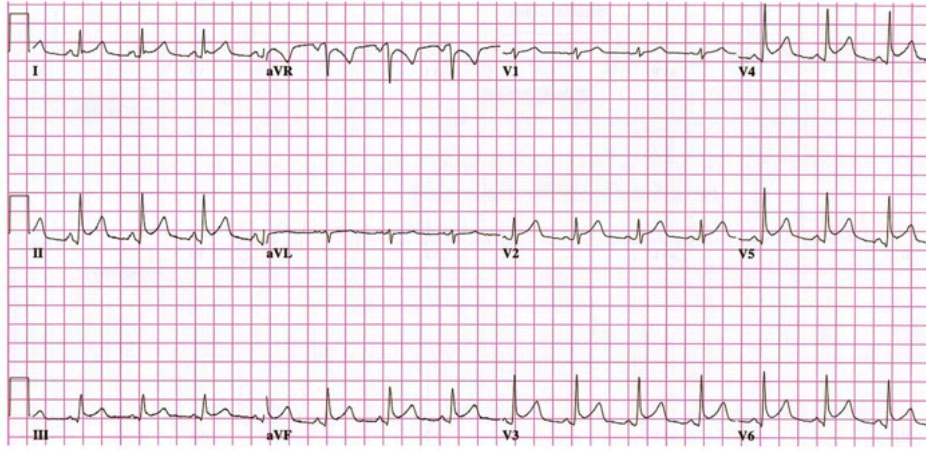
Diffuse STE except aVR and V1
Concave STE
PR depression



EKG mimic STEMI

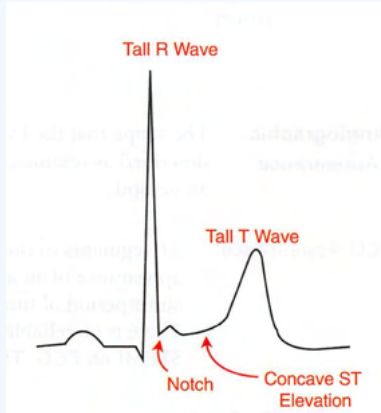
Pericarditis

ECG 12.7a A 60-year-old woman with mesothelioma complains of dyspnea 1 day after thoracotomy.



EKG mimic STEMI

Early repolarization



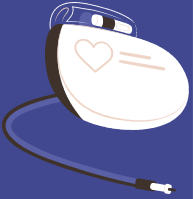
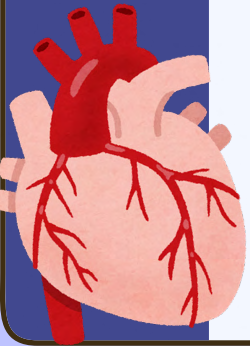
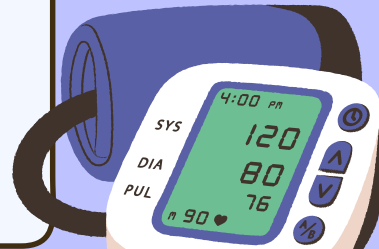
Concave J point STE
in precordial leads

Tall R wave

Tall T wave

Notch

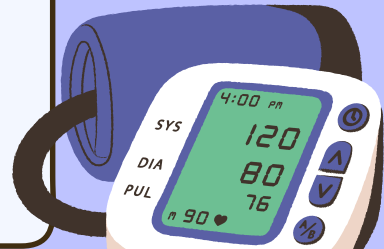
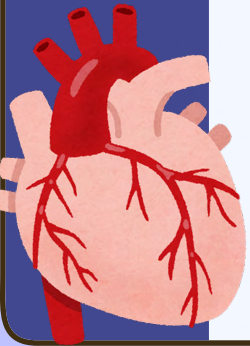
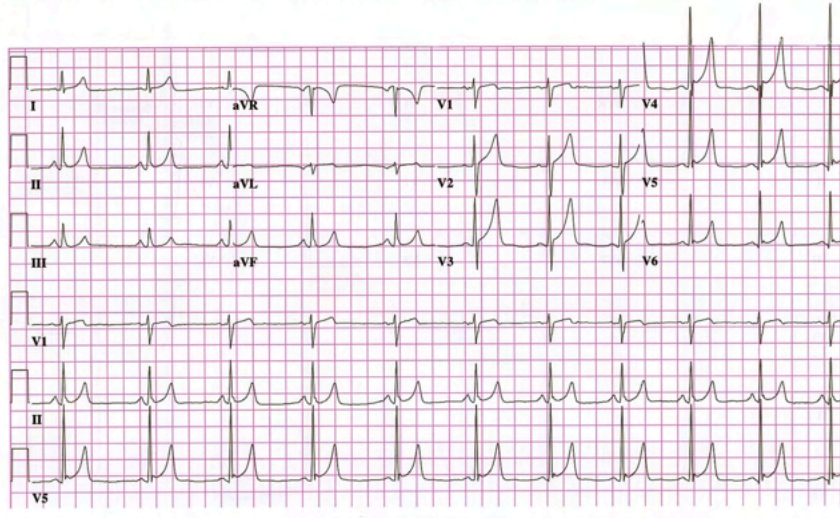
No reciprocal STD



EKG mimic STEMI

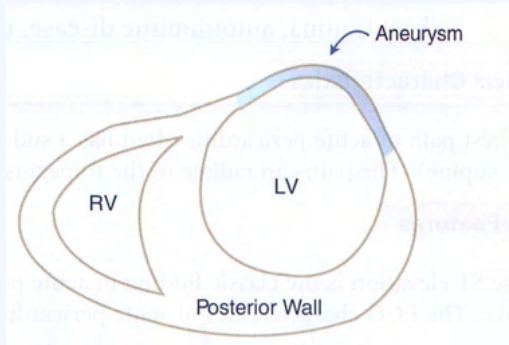
Early repolarization

ECG 12.3a A 36-year-old male complains of light-headedness for 4 months following a motor vehicle collision.



EKG mimic STEMI

LV aneurysm



Complication after
anterior wall STEMI

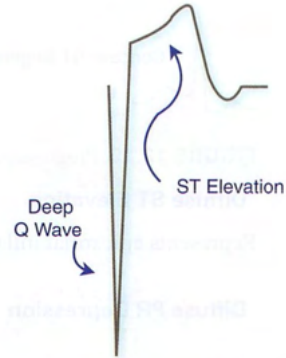
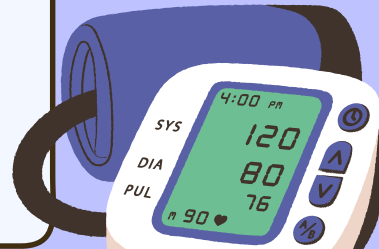


FIGURE 12.18 ECG appearance
of an anterior LV aneurysm.

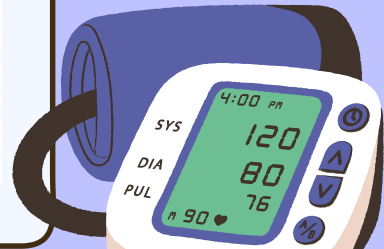
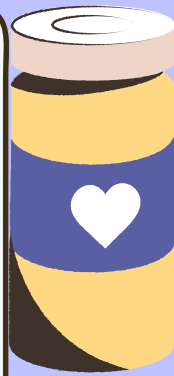
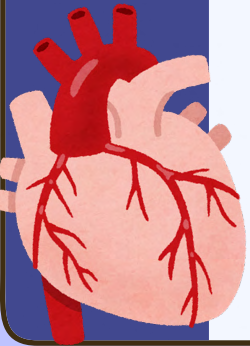
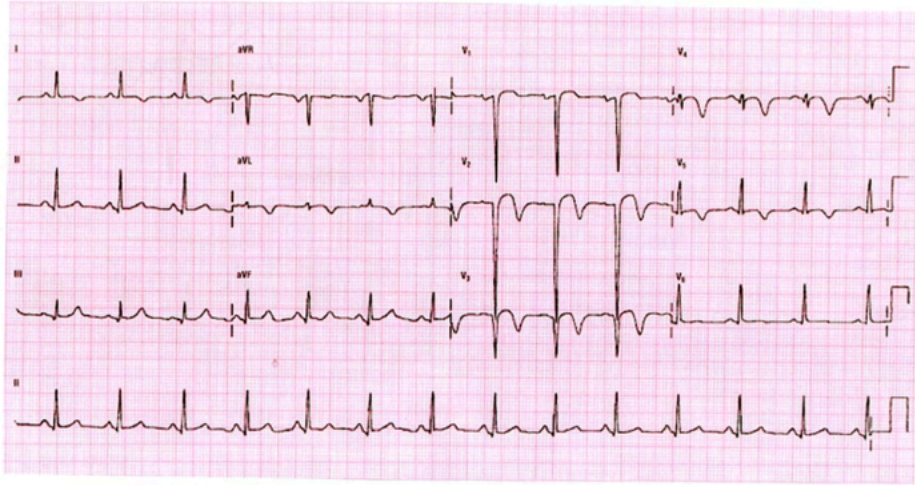
Deep Q
No reciprocal STD



EKG mimic STEMI

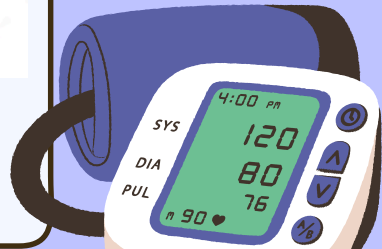
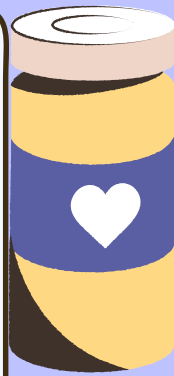
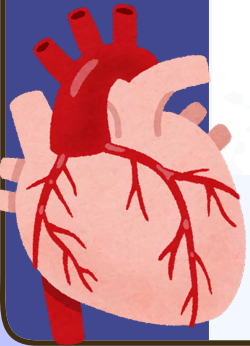
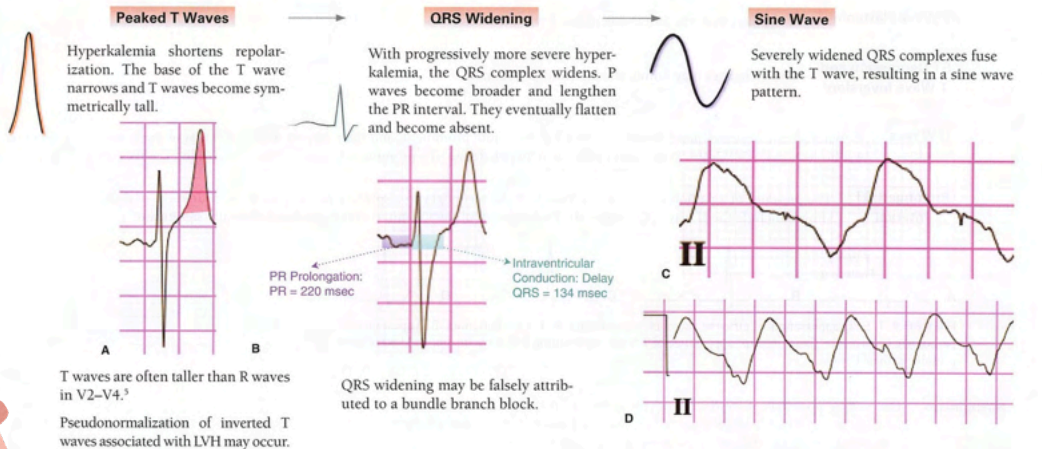
LV aneurysm

ECG 12.10a A 75-year-old woman complains of 2 days of dyspnea, 6 months after being hospitalized for a MI.



EKG mimic STEMI

Hyperkalemia



EKG mimic STEMI

Hyperkalemia

ECG 8.2a A 55-year-old man is found laying supine on a sidewalk.

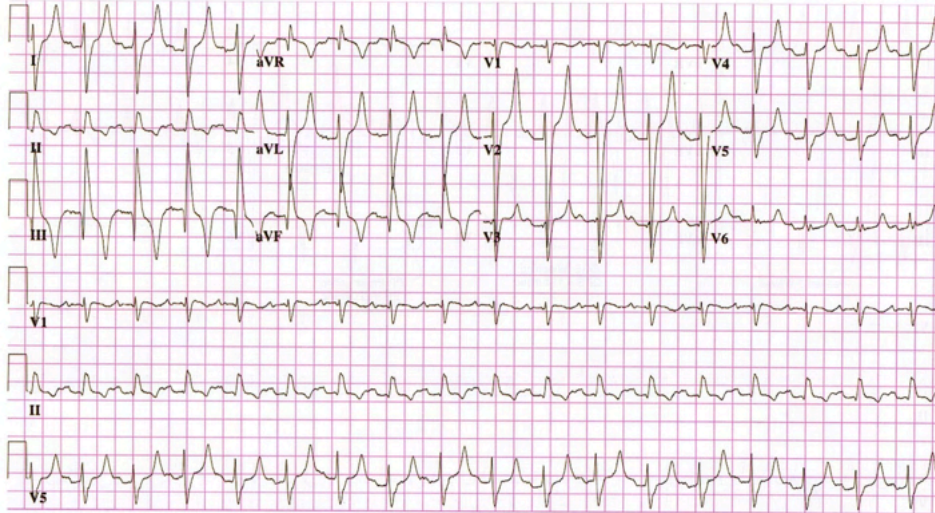
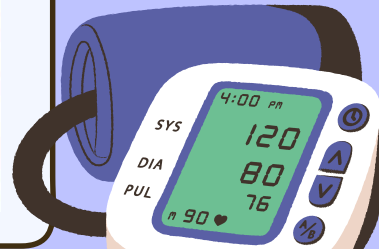
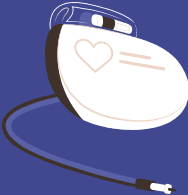


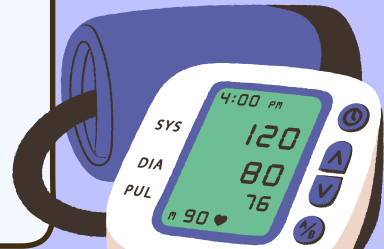
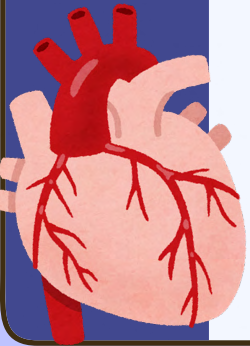
Image courtesy of Roberta Capp, MD.





Tachycardia algorithm

1. Assess Patient
2. Secure Airway (ABC), IV access, Monitoring
3. Identify Stability (Stable vs. Unstable)
4. Identify QRS width (narrow vs wide) and regularity
5. If unstable → synchronized cardioversion
6. If stable → consider vagal maneuvers, adenosine (SVT), or antiarrhythmics
7. Identify and Treat Reversible Causes (H's & T's).



Tachycardia algorithm

Adult Tachyarrhythmia With a Pulse Algorithm

Assess appropriateness of heart rate for clinical condition. Heart rate typically $\geq 150/\text{min}$ if tachyarrhythmia.

Initial assessment and support

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Continue cardiac monitoring to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-lead ECG, if available

Persistent tachyarrhythmia causing

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Yes

Synchronized cardioversion

- Sedate whenever feasible
- If regular narrow complex, consider adenosine

No

Wide QRS?

≥ 0.12 second

Yes

Consider

- Adenosine only if regular and monomorphic
- Antiarrhythmic infusion
- Expert consultation

No

- Vagal maneuvers (if regular)
- Adenosine (if regular)
- β -Blocker or calcium channel blocker
- Consider expert consultation

Doses/Details

Synchronized cardioversion:

Refer to your specific device's recommended energy level or to relevant 2025 Guidelines sections to maximize first shock success. If not known, use the maximum energy setting.

Adenosine IV dose:

First dose: 6 mg rapid IV push; follow with NS flush.
Second dose: 12 mg if required.

Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

Procainamide IV dose:

20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases $>50\%$, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

Amiodarone IV dose:

First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

If refractory, consider

- Underlying cause
- Need to increase energy level for next cardioversion
- Addition of antiarrhythmic drug
- Expert consultation

Vagal maneuver

Carotid massage

Valsalva maneuver : use 10 ml syringe (40 mmHg)

Modified Valsalva Maneuver

for Treatment of Supraventricular Tachycardia (SVT)

(43% cardioversion vs 17% standard Valsalva - REVERT Trial - Lancet 2015)



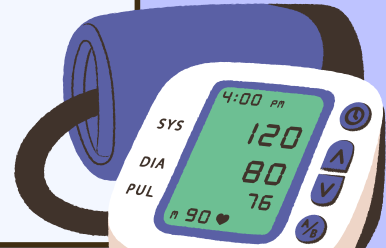
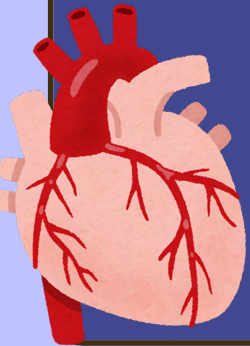
1) In a semi-recumbent position, blow into a 10cc syringe for 15 seconds, generating ~40 mmHg pressure (Standard Valsalva Maneuver)



2) Move patient to a supine position and perform a 15 second passive leg raise to an elevation of 45°



3) Return to semi-recumbent position for 30 seconds. Can repeat if no success in cardioversion.



Synchronized cardioversion

100 J 200 J

Electrical Cardioversion Algorithm



Notes

*Effective regimens have included a sedative (eg, diazepam) with or without an analgesic agent (eg, fentanyl). Many experts recommend anesthesia if service is readily available.

†Note possible need to resynchronize after each cardioversion.

††If delays in synchronization occur and clinical condition is critical, go immediately to unsynchronized shocks.

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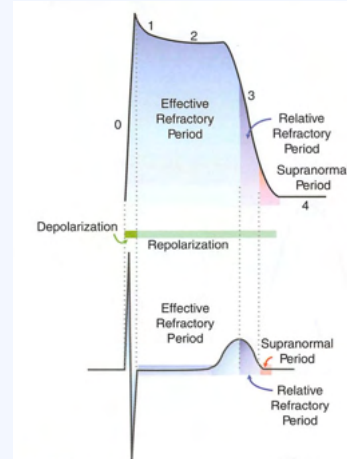
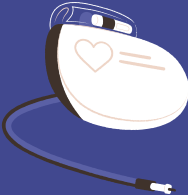


FIGURE 1.4 Refractory periods during different phases of the action potential and cardiac cycle on ECG.

Wait until it shocks!!



Hyperkalemia treatment

Antagonize cardiac effect

10% Ca gluconate 10 ml in 10 min

EKG change
or $K > 6$

Redistribution K

RI 10 U + 50% glucose 50 ml

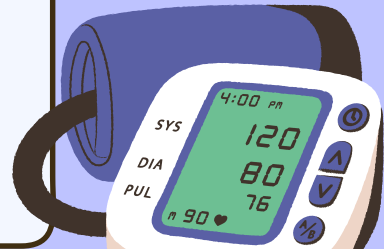
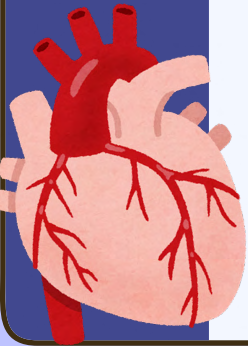
NaHCO₃ if acidosis

Salbutamol 10 mg NB

K removal

Kidney : Diuretic, HD

GI : Kalimate 30 gm PO/PR + laxative



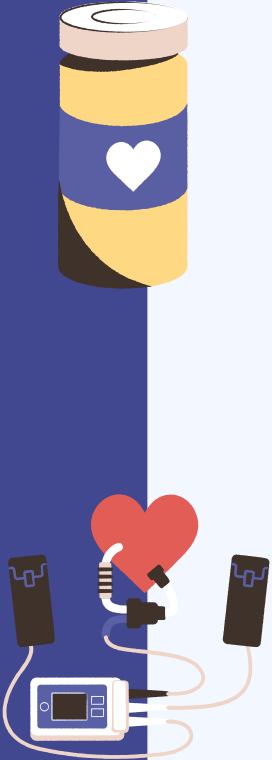
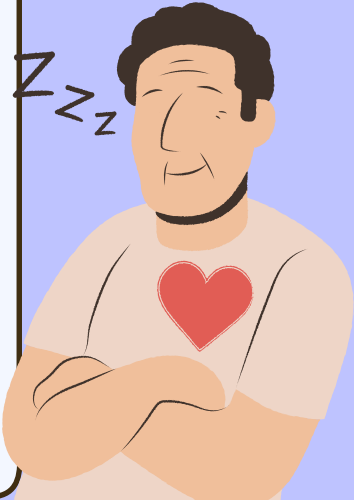
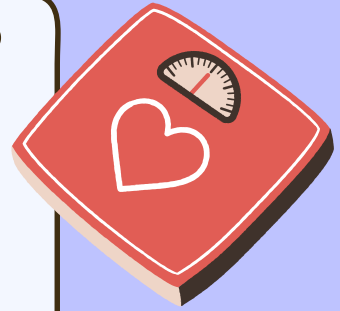
Case 3

STEMI equivalent

Airway management

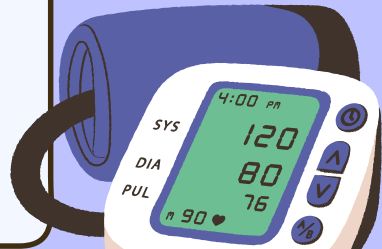
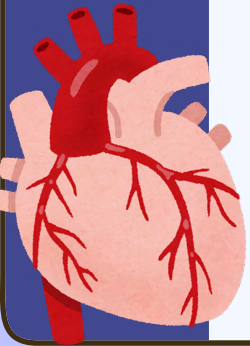
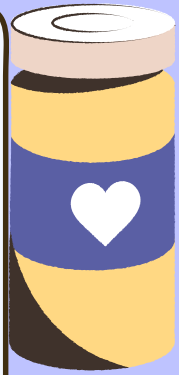
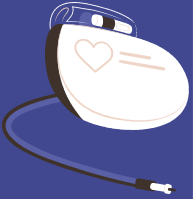
RSI

DOPE evaluation



STEMI equivalent

STEMI that doesn't look like STEMI

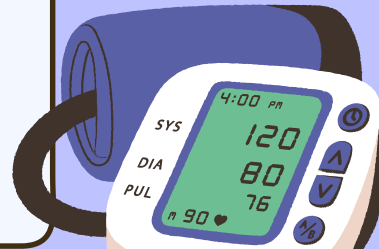


De winter

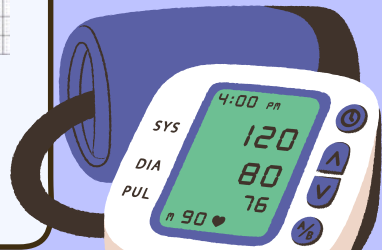
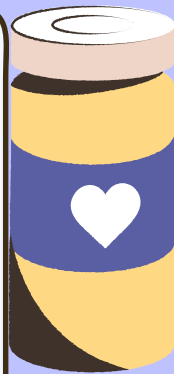
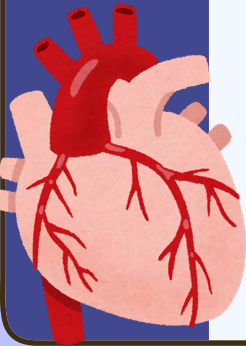
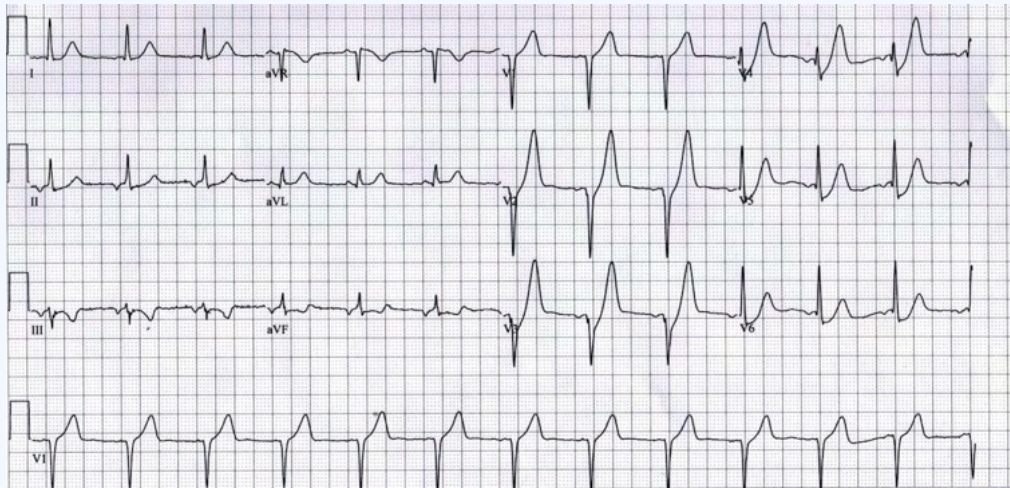
- Symmetrical, **tall T waves** (*precordial leads*)
- Upsloping **ST segment depression** $> 1\text{mm}$ at the J-point (*precordial leads*)
- Subtle **ST segment elevation** (0.5-1mm) in **aVR**
- **Absence** of **ST elevation** (*precordial leads*)
- "Normal" STEMI morphology may precede or follow the De Winter pattern



de Winter wave



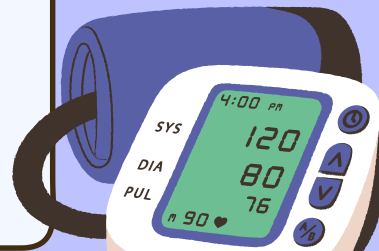
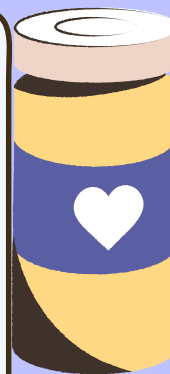
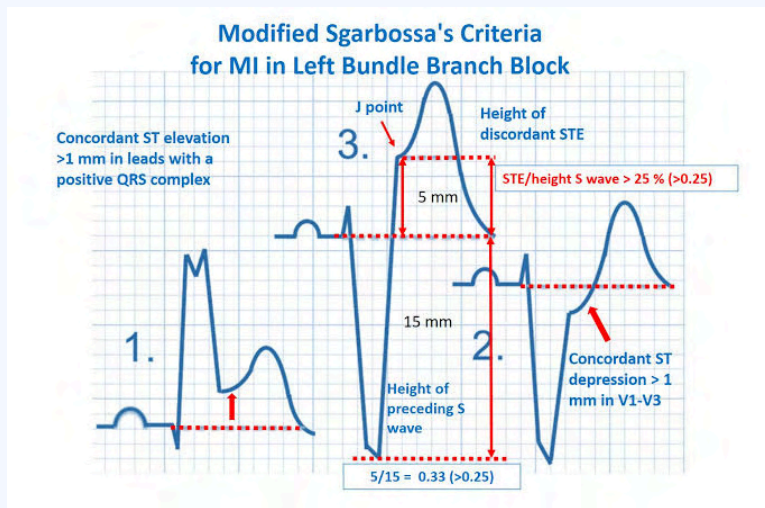
De winter

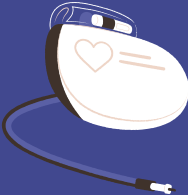


LBBB

New LBBB = STEMI

New LBBB ? : Sgarbossa, Barcelona



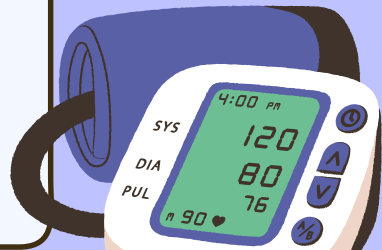
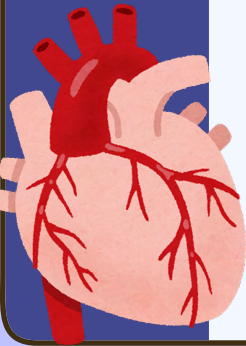
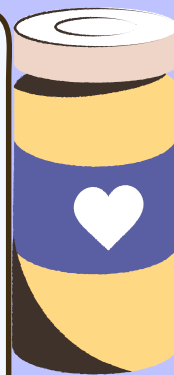


LBBB

New LBBB = STEMI

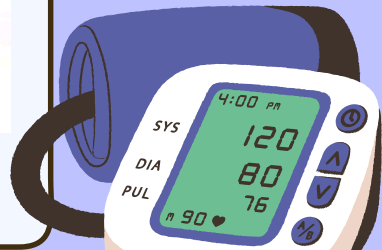
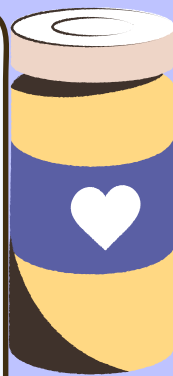
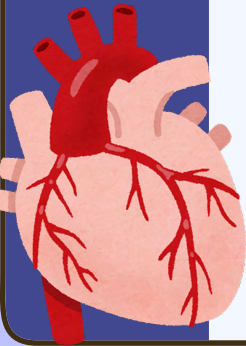
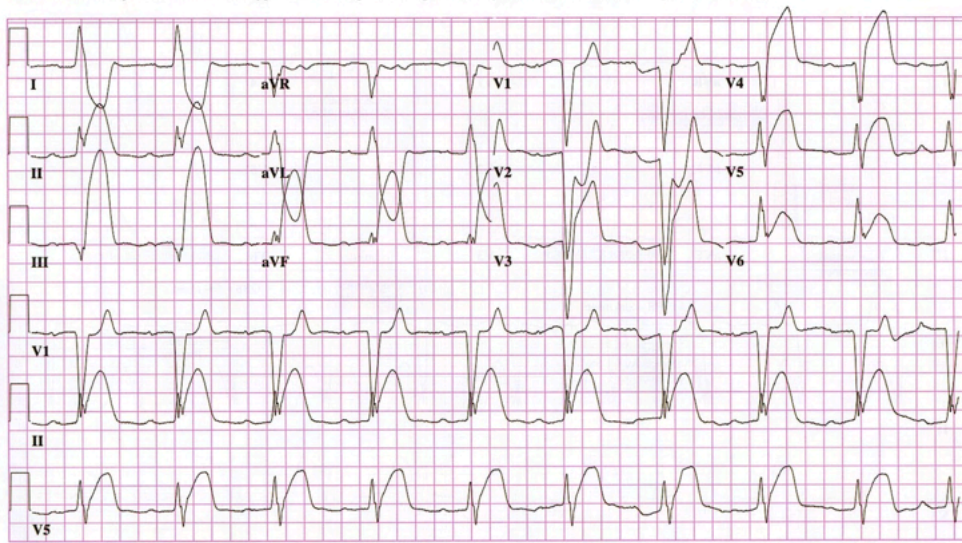
New LBBB ? : Sgarbossa, Barcelona

1. Barcelona criteria มีเกณฑ์ดังต่อไปนี้
 - Concordant ST deviation (elevation หรือ depression ก็ได้) มากกว่าหรือเท่ากับ 1 mm
 - Discordant ST deviation มากกว่าหรือเท่ากับ 1 mm ใน lead ที่ R/S wave สูงไม่เกิน 6 mm
2. Barcelona criteria มี sensitivity ในการวินิจฉัย AMI มากกว่า Sgarbossa criteria และ Modified Sgarbossa criteria โดยมี specificity ใกล้เคียงกัน (ยกเว้น Sgarbossa score ≥ 3 จะมี specificity มากกว่า Barcelona criteria)
3. Sensitivity ของ Barcelona criteria = 93-95%, specificity ของ Barcelona criteria = 89-94%



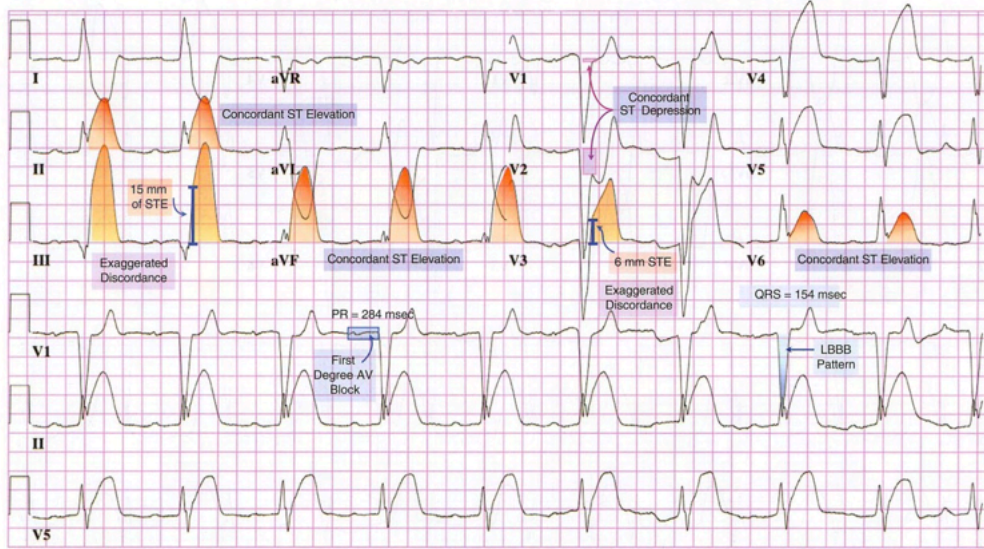
LBBB

ECG 12.15a A 83-year-old female with hypertension complained of general body aches and intermittent diaphoresis for 2 days.

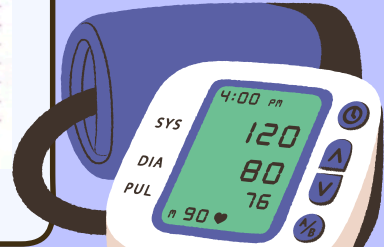
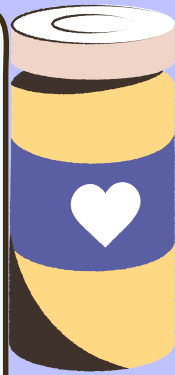
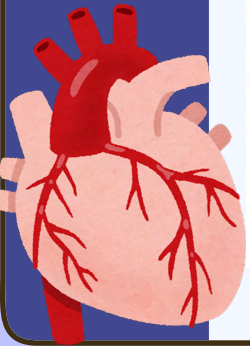


LBBB

ECG 12.15b A 83-year-old female with hypertension complained of general body aches and intermittent diaphoresis for 2 days.



Inferoposterior MI and LBBB



(isolated) posterior wall STEMI

Posterior STEMI

Turn the ECG upside down:

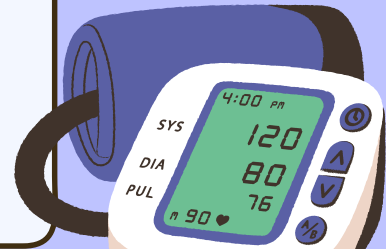
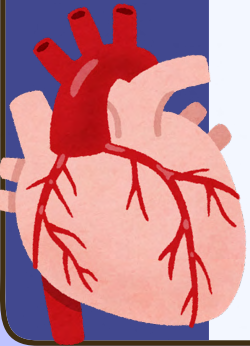


- ST depression → ST elevation
- R wave → Q wave
- Upright T wave → inverted terminal T wave

Emergent coronary reperfusion indicated!!

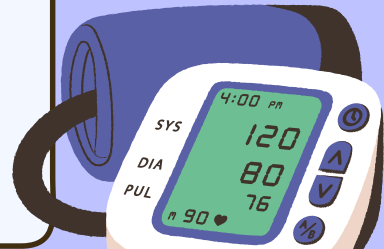
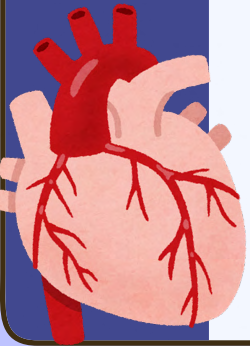
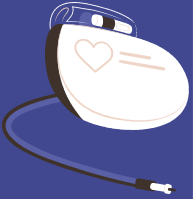
- It is confirmed by the presence of ST elevation **> 0.5 mm** in leads **V7 to V9**
- **Reciprocal changes in the anterior leads**
(STD → STE if ECG turned upside down)

Posterior wall STEMI : often accompanies
inferior or lateral wall STEMI



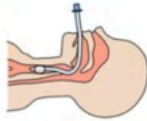
RSI

- P Preparation
- P Preoxygenation
- P Pretreatment
- P Paralysis with induction
- P Positioning
- P Placement of tube
- P Postintubation management

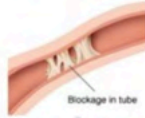


DOPE evaluation

Intubated patient that's deteriorating?
Remember **DOPE**!



Displacement



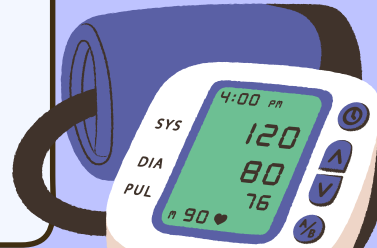
Obstruction



Pneumothorax



Equipment Failure

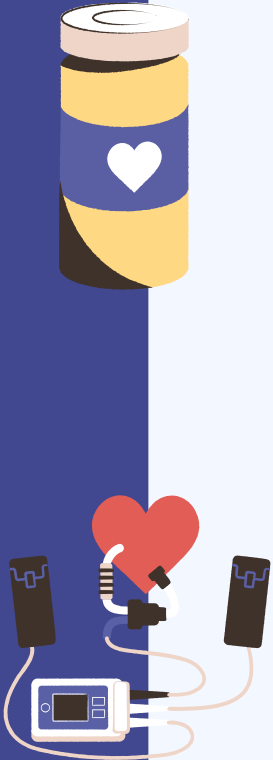
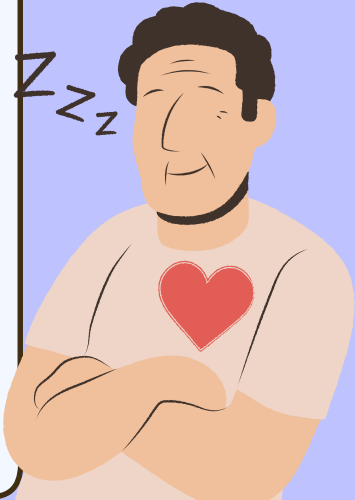
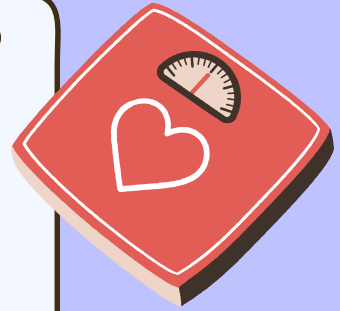


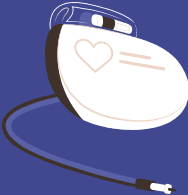
Case 4

Basic toxicology

Cardiac arrest algorithm

TCA management





Basic toxicology

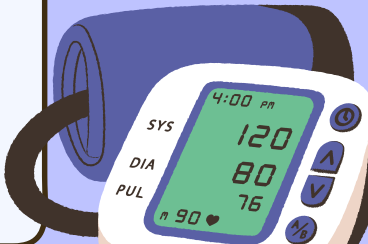
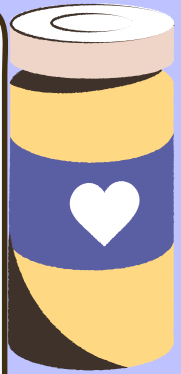
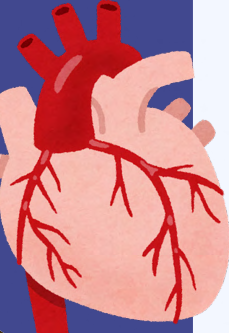
ABCD first

Toxico management

Decontaminate : Lavage, charcoal, WBI

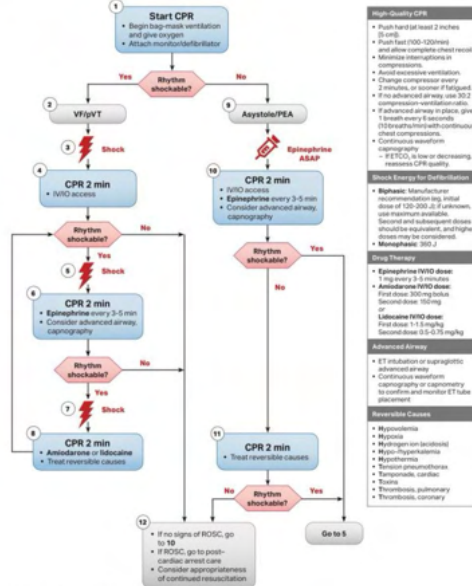
Increased elimination : MDAC, urine alkalinization, HD

Specific antidote

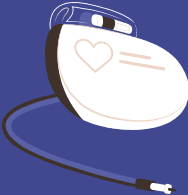


Cardiac arrest algorithm

Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)



© 2025 American Heart Association

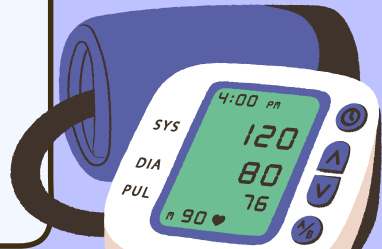
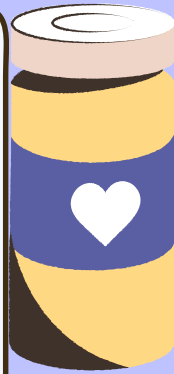
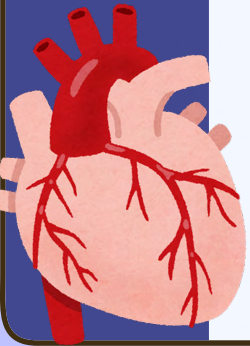


Cardiac arrest algorithm

If Aystole : check flat line protocol

Check lead
change lead
increase amplitude

Asystole = fine VF ??



TCA overdose

EKG of TCA overdose

sinus tachycardia

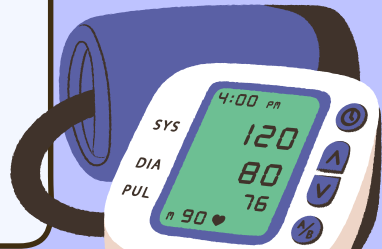
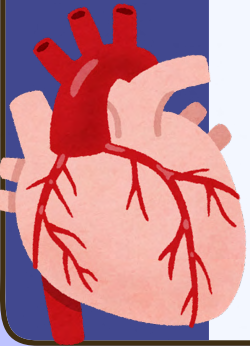
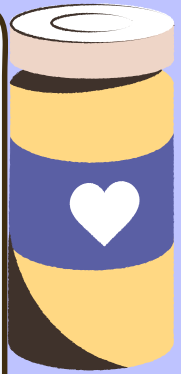
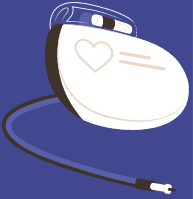
wide QRS > 100 msec

prolonged QTc

prolonged PR interval

tall R in aVR

R/S wave > 0.7



TCA overdose

Treatment

- **7.5% NaHCO₃ 50-100 ml**
if QRS complex > 100 msec
- If seizure avoid Phenytoin
(Diazepam, Phenobarbital)

