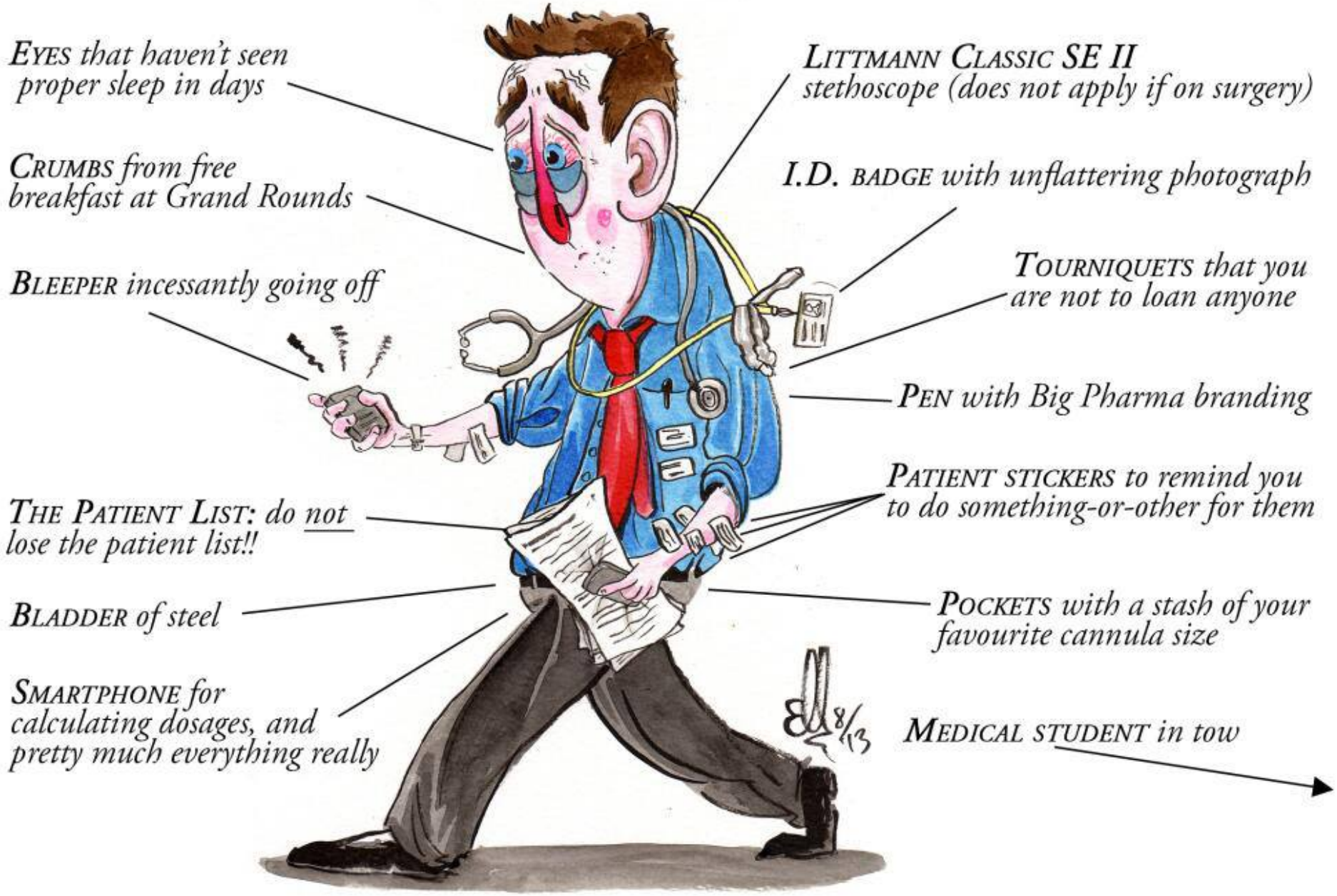
On-Call Scenarios

DUKE-SIP ZOOM

Dr Hong Rilong



Anatomy of a JUNIOR DOCTOR

General advice for night calls

- Challenging but good learning value – first time on your own
- Scope of duties: New cases (active) + CTSPs (passive)
  - Clerk fully, not ‘pre-clerk’, not copy ED notes.
  - Remember to check NEHR and order old meds
  - Think, not just do.
- Managing workload
  - Prioritization
  - Spend time where it counts
  - Work with your MO - but take ownership of the call

CTSP 3

Doctor, this is staff nurse Delores from ward 45A side, calling about room 9 bed 1. Patient is having chest discomfort. Can you please order Panadol for the patient?

- 55 yo Indian Male, smoker x 20 pack years, ADL independent, community ambulant.
- Day 2 of admission for for Community Acquired Pneumonia. No other significant past medical history.
- Vitals signs:
  - HR 101 BP 120/80 Afebrile. SpO2 99% RA
- Current meds: IV Augmentin and PO doxycycline

What are your next steps?

1. What are the red flags you must look out for?

2. What is the likely diagnosis?

3. How would you proceed to evaluate the patient?

Breakout Task: bearing in mind the above, write out a simple management plan for the patient (5min)

Now c/o:

Retrosternal chest pain, gets it on and off previously.

Worse after food and lying down. a/w bitter taste in back of mouth.

No orthopnoea/PND/decreased ET

Clinical examination unremarkable

Alert, comfortable, not in distress

JVP not raised

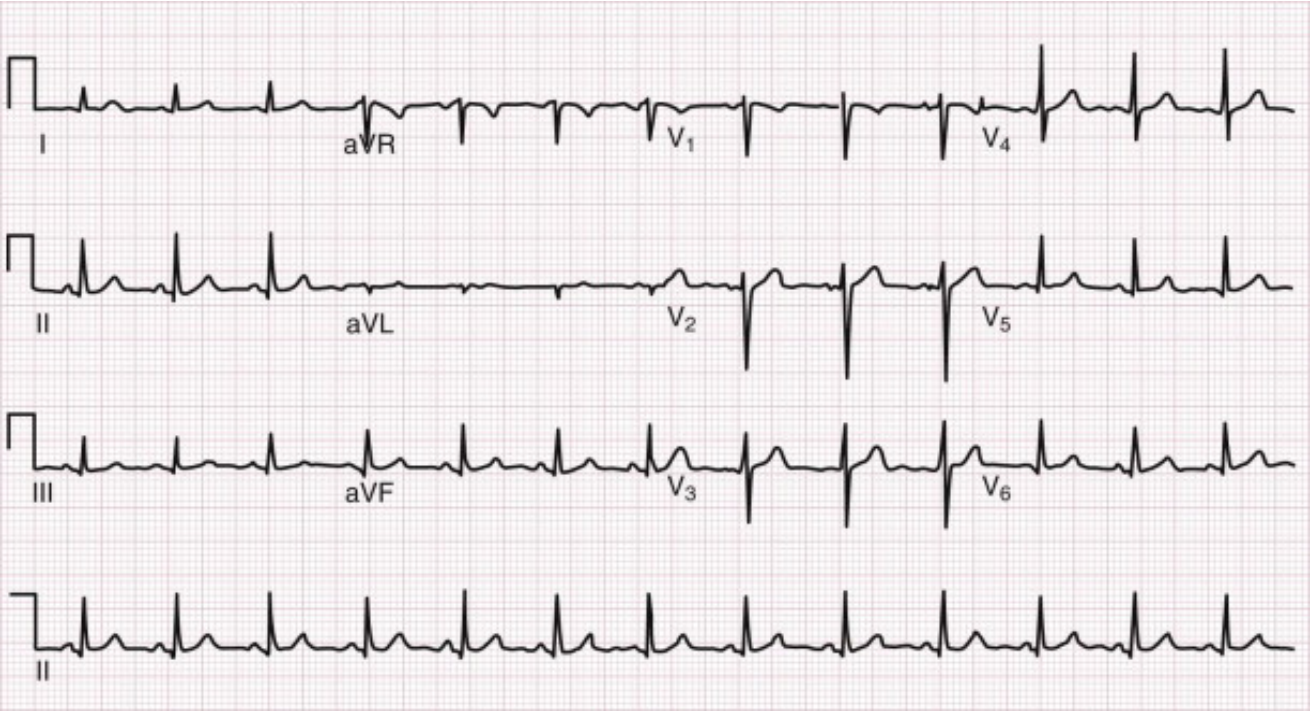
H S1 S2 no murmur

L left basal crepitations

A SNT

C supple nil oedema

No radio-radio delay, differential BP



Always Rule out Life threatening conditions!!

- Causes of chest pain that pose an immediate threat to life include:
  - Heart
    - Acute coronary syndrome (ECG)
    - Acute aortic dissection (RR-delay/RF-delay)
  - Lung
    - Pulmonary embolism (sinus tachycardia/desaturation)
    - Tension pneumothorax (Tracheal deviation/hyper-resonant)
    - Pericardial tamponade (Beck triad)

  - +/- Mediastinitis (eg, Esophageal rupture) - CXR

Likely Diagnosis

- Oesophagitis secondary to doxycycline therapy*
  - Omeprazole/MMT PRN/domperidone/administration advice
    - advising patients to take doxycycline with food or a large glass of water, and to sit upright or stand for at least 30 minutes afterwards.
  - May want to consider endoscopic evaluation if persistent despite treatment or associated with systemic symptoms or >50 years old

Other possibilities

- Cardiac: Stable angina, Aortic stenosis/MVP
- Pulmonary: Pneumonia/pneumothorax
- Chest wall/MSK: Muscle strain/costochondritis
- Others: Anxiety, PUD

*https://www.medsafe.govt.nz/profs/PUarticles/DoxOesoph.htm

Ruling Out ACS

Select the significant troponin trend (<30NG/L)

1. 200 → 8 hours → 210 → 8 hours → 208
2. 35 → 3 hours → 45
3. 250 → 8 hours → 200 → 8 hours → 160
4. 20 → 3 hours → 25

Pollev: select options (can be multiple)

4th Universal Criteria

- Type 1 (atherothrombotic coronary artery disease)
  - Detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL and with at least one of the following:
    - Symptoms of acute myocardial ischaemia;
    - New ischemic ECG changes;
    - Development of pathological Q waves;
    - Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology;
    - Identification of a coronary thrombus by angiography including intracoronary imaging or by autopsy
- Type 2 (mismatch between supply and demand)
  - Detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL, and evidence of an imbalance between myocardial oxygen supply and demand unrelated to acute coronary athero-thrombosis, requiring at least one of the following:
    - Symptoms of acute myocardial ischaemia;
    - New ischaemic ECG changes;
    - Development of pathological Q waves;
    - Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology.

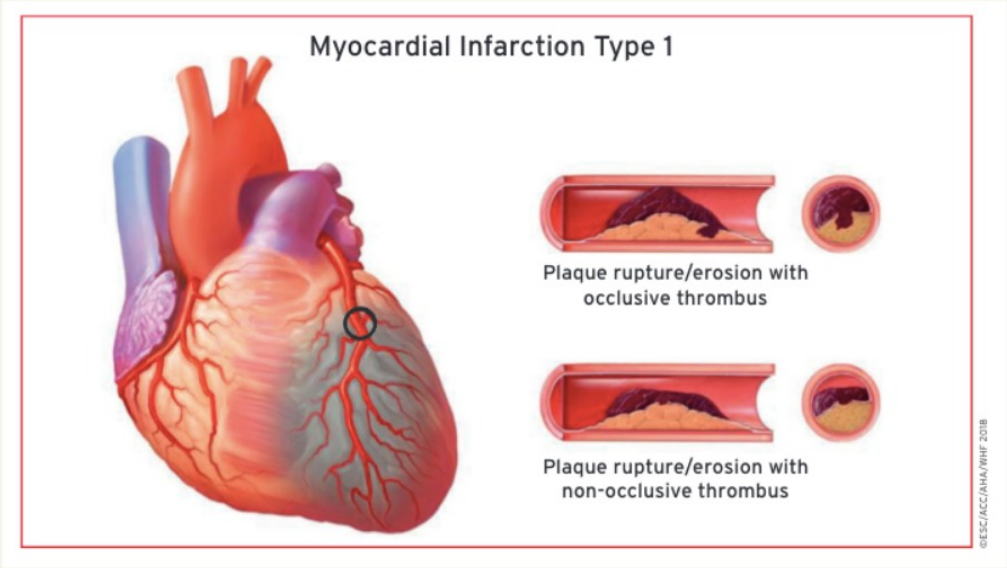


Figure 3 Myocardial infarction type 1.

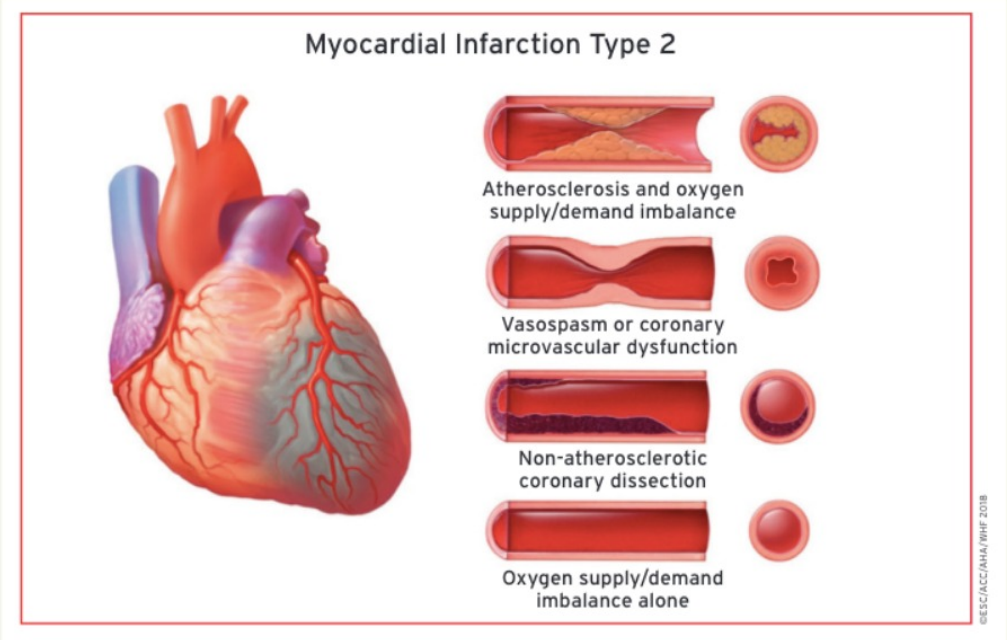
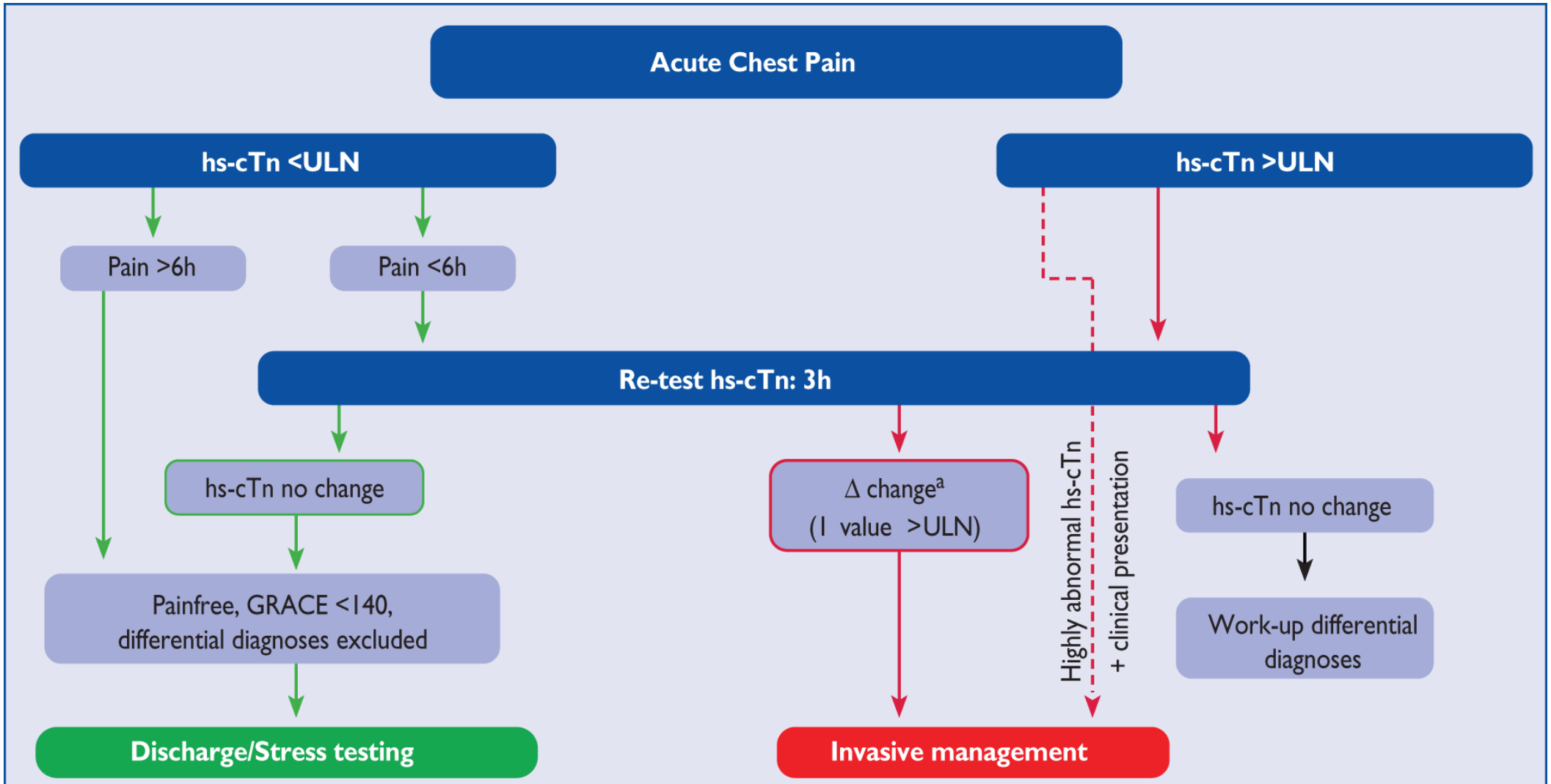


Figure 4 Myocardial infarction type 2.

Interval Between Cardiac Enzymes?

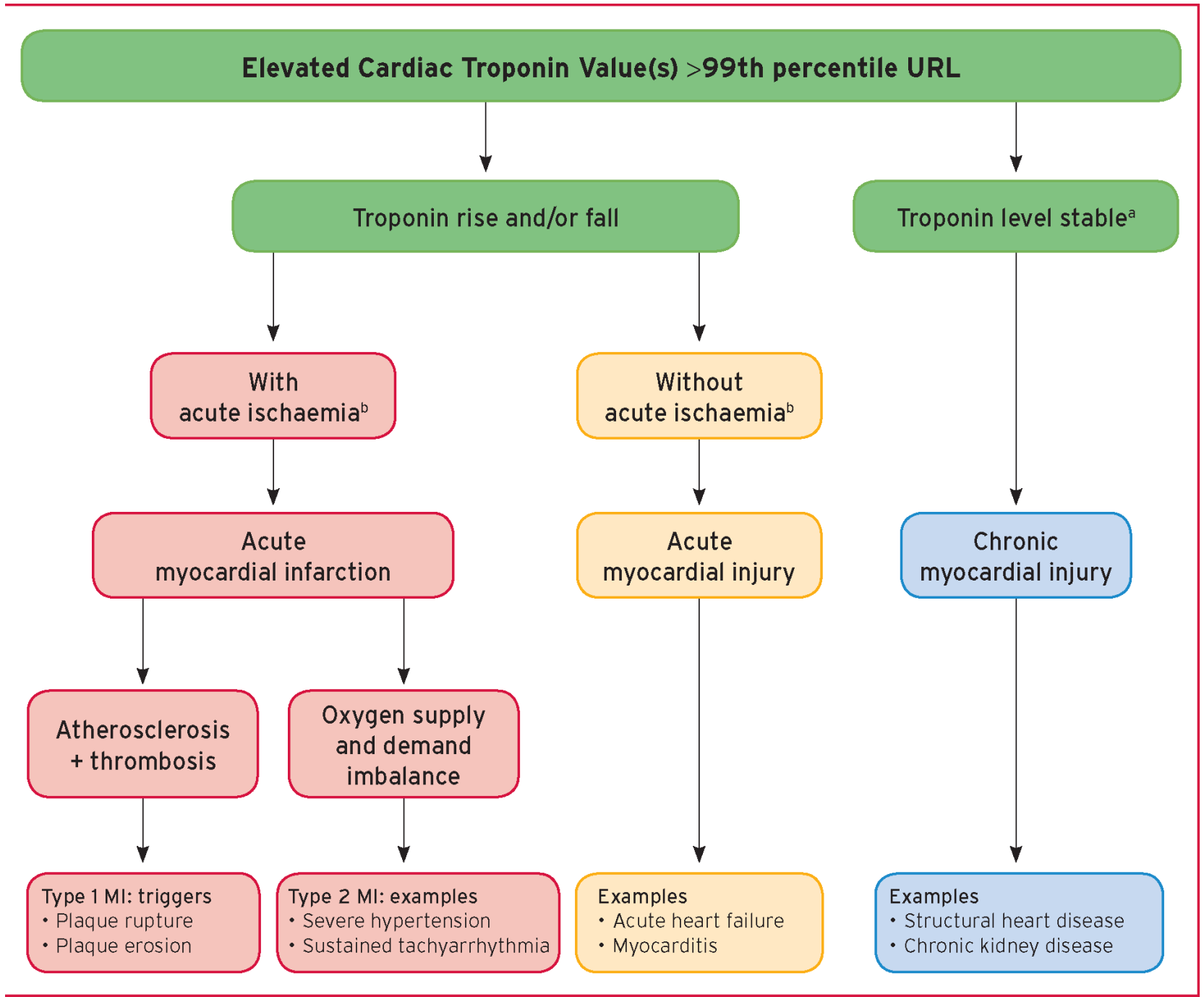


GRACE = Global Registry of Acute Coronary Events score; hs-cTn = high sensitivity cardiac troponin; ULN = upper limit of normal, 99th percentile of healthy controls.
[a]Δ change, dependent on assay. Highly abnormal hsTn defines values beyond 5-fold the upper limit of normal.

Troponin must be interpreted in the appropriate clinical context

Select the significant troponin trend (<30NG/L)

1. 200 → 8 hours → 210 → 8 hours → 208 (CKD patient – nil chest pain)
2. 35 → 3 hours → 45 (with new ECG changes – deep symmetrical T wave inversion)
3. 250 → 8 hours → 200 → 8 hours → 160 (with chest pain 5 days ago)
4. 20 → 3 hours → 25 (25 yo with nil risk factors – "routine screen" on admission for Gastroenteritis)



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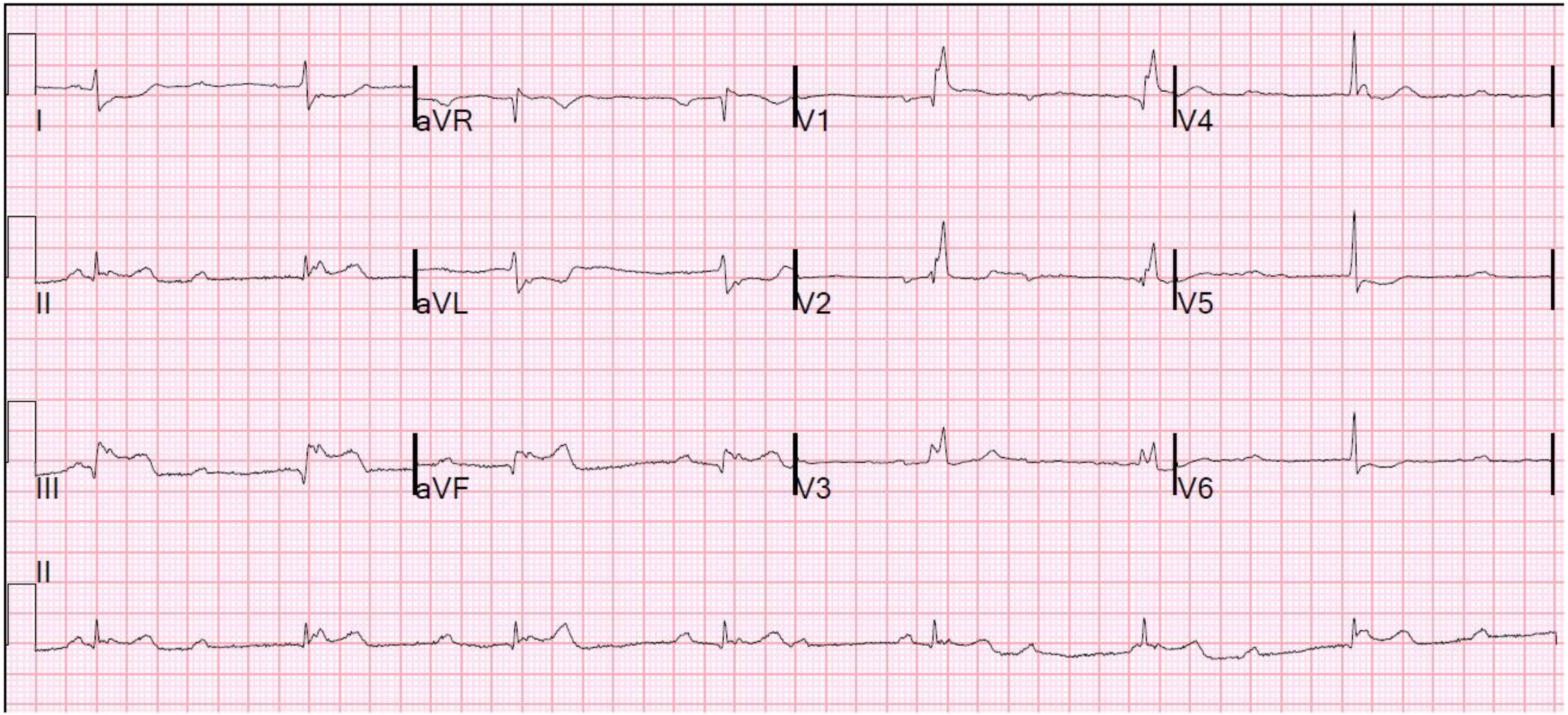
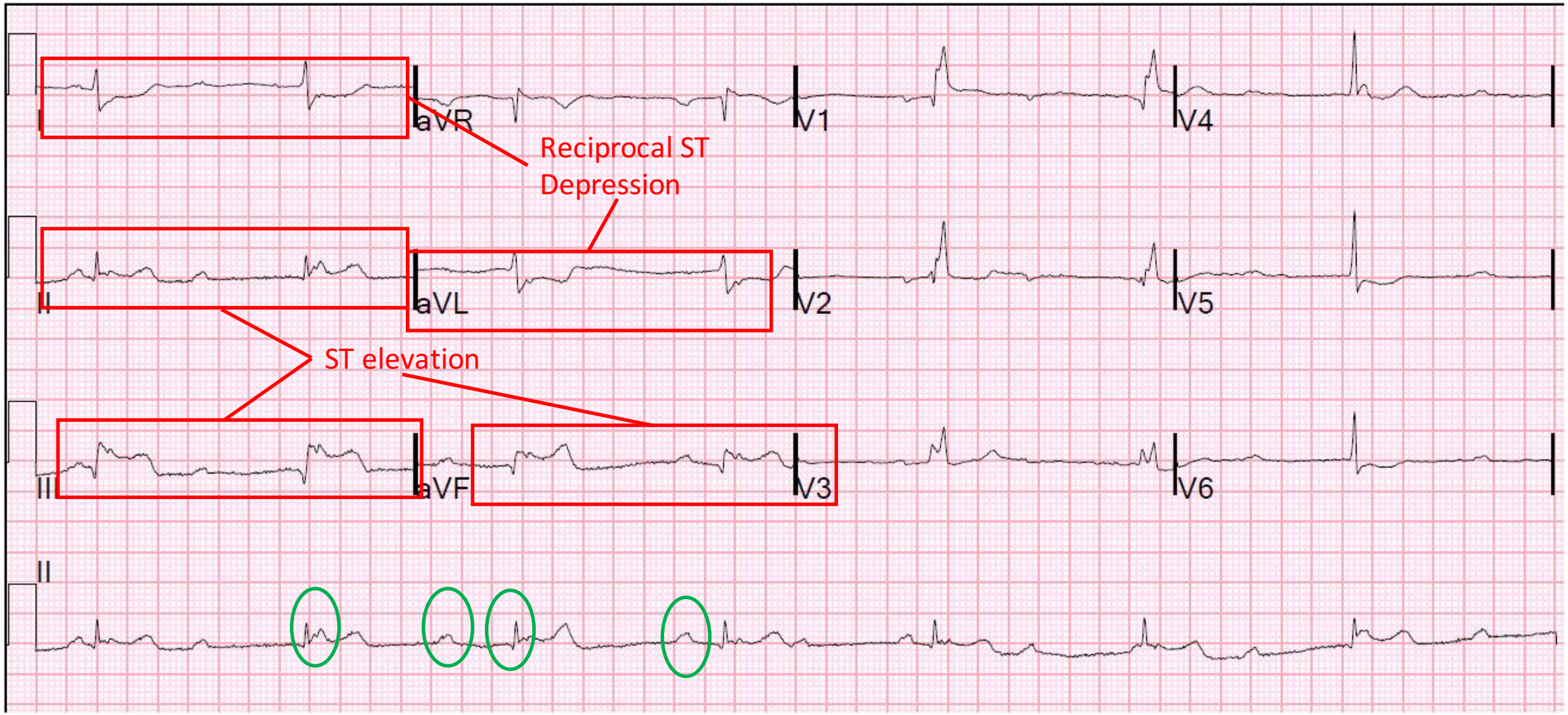
Doctor, this is staff nurse Mary from ward 45B side, calling about room 25 bed 1. Patient is having chest pain. He doesn't look good, can you come and see him?

- Mr ABC is a 56 year old Chinese Male, Taxi-driver, who was admitted for fluid overload secondary to fluid indiscretion and missed dialysis from URTI.
- Today is D5 of admission and he has just returned from haemodialysis.
- Just underwent normal HD and removed 2.5L of fluid. During dialysis, BP was stable.
- Past medical history
  - ESRF sec to DM on HD 1 3 5
  - HTN
  - HLD
  - DM
- Medication history
  - Aspirin 100mg OM
  - Omeprazole 20mg OM
  - Simvastatin 10mg ON
  - Mixtard 14u BD premeal

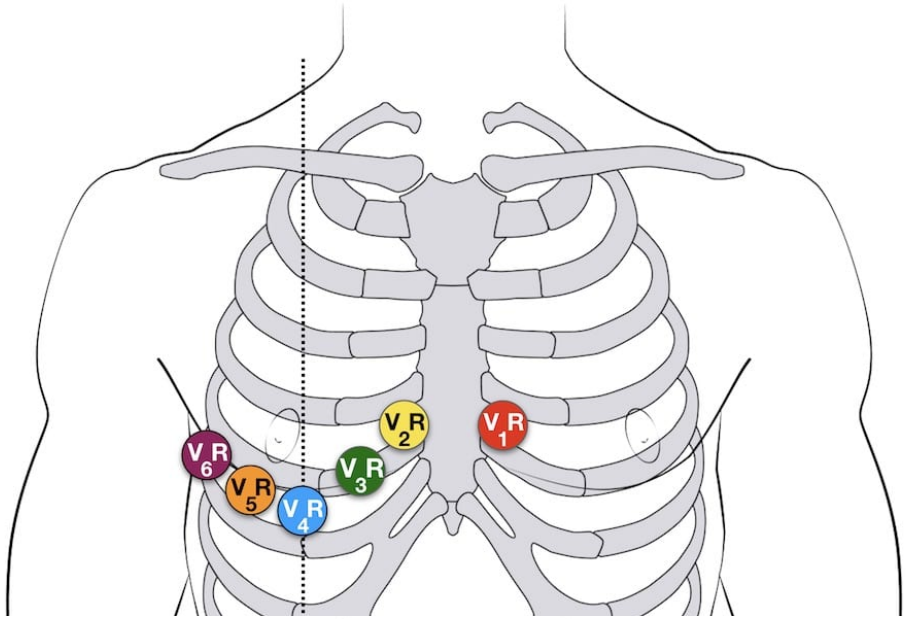
- Vitals
  - HR 60
  - BP 170/80
  - T 37.4
  - SpO2 94% RA
- Examination
  - Diaphoretic
  - JVP elevated
  - H: S1S2
  - L: Clear
  - A: SNt
  - Calves supple

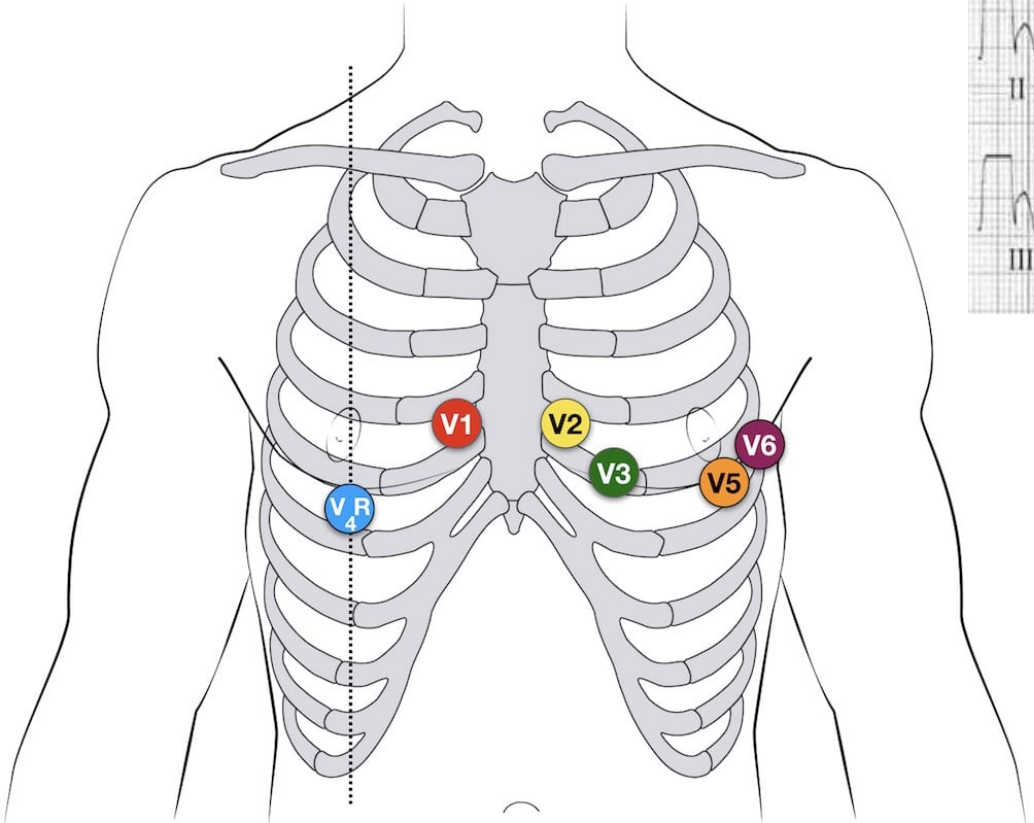


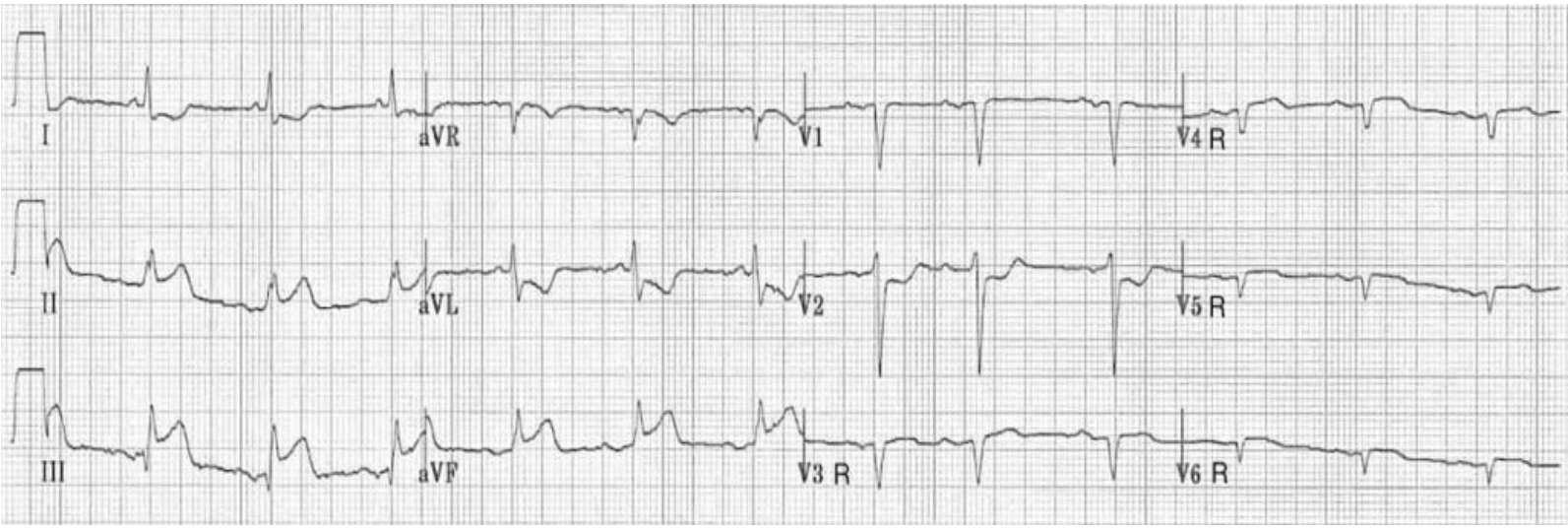
Pollev: select area of abnormalities



Inferior STEMI – likely RCA (III > II) with complete heart block
Possible right ventricular infarction


V R 6
V R 5
V R 4
V R 3
V R 2
V R 1


V1
V2
V3
V4 R
V5
V6


I
aVR
V1
V4 R
II
aVL
V2
V5 R
III
aVF
V3 R
V6 R

Management

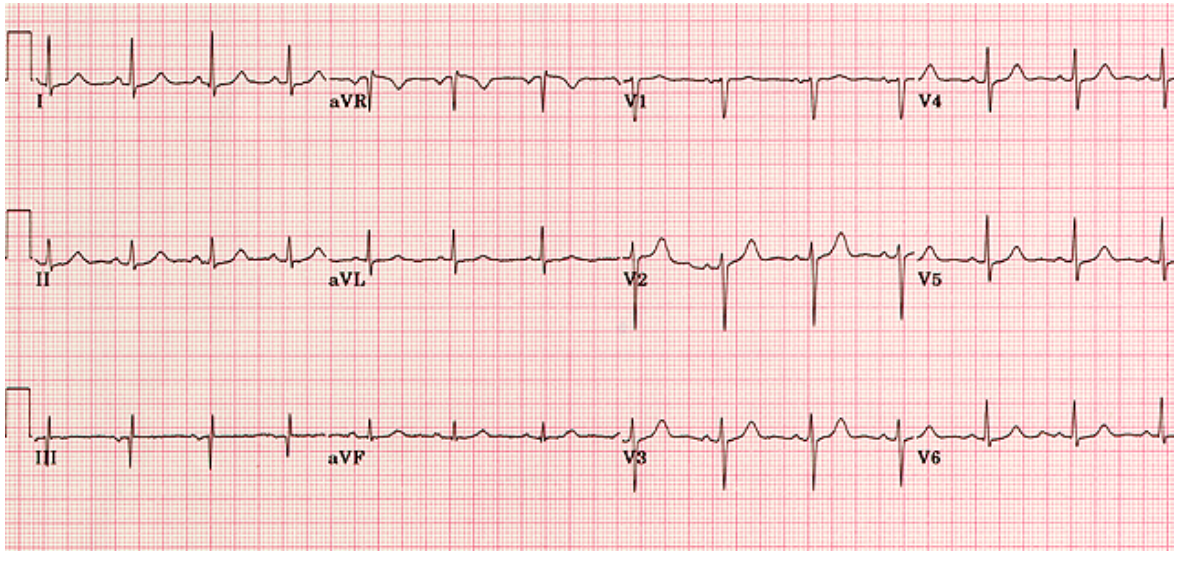
- Serial ECG (15-30min apart within 1st hour)
- Cardiac enzymes
- FBC UE APTT/PT GXM, CXR (portable)
- How would you manage?
  - Hourly parameters/monitoring
  - Supplemental O2? ← recent evidence shows no benefit of supplemental O2 in MI if patient is not hypoxic
  - SL GTN or GTN spray
  - Update MO → urgent CVM referral
  - Check past medical history - specifically cardiac hx and contraindication to antiplatelets
  - Medications
    - Load ticagrelor - 180mg or plavix
    - Change simvastatin to atorvastatin 40mg ON/Rosuvastatin 20mg ON
- Specific management
  - Inferior MI (RCA infarct) – watch out for right ventricular infarction/2nd or 3rd degree heart block
  - Anterior MI (LAD) – watch for APO/ventricular tachyarrhythmias
- Update family

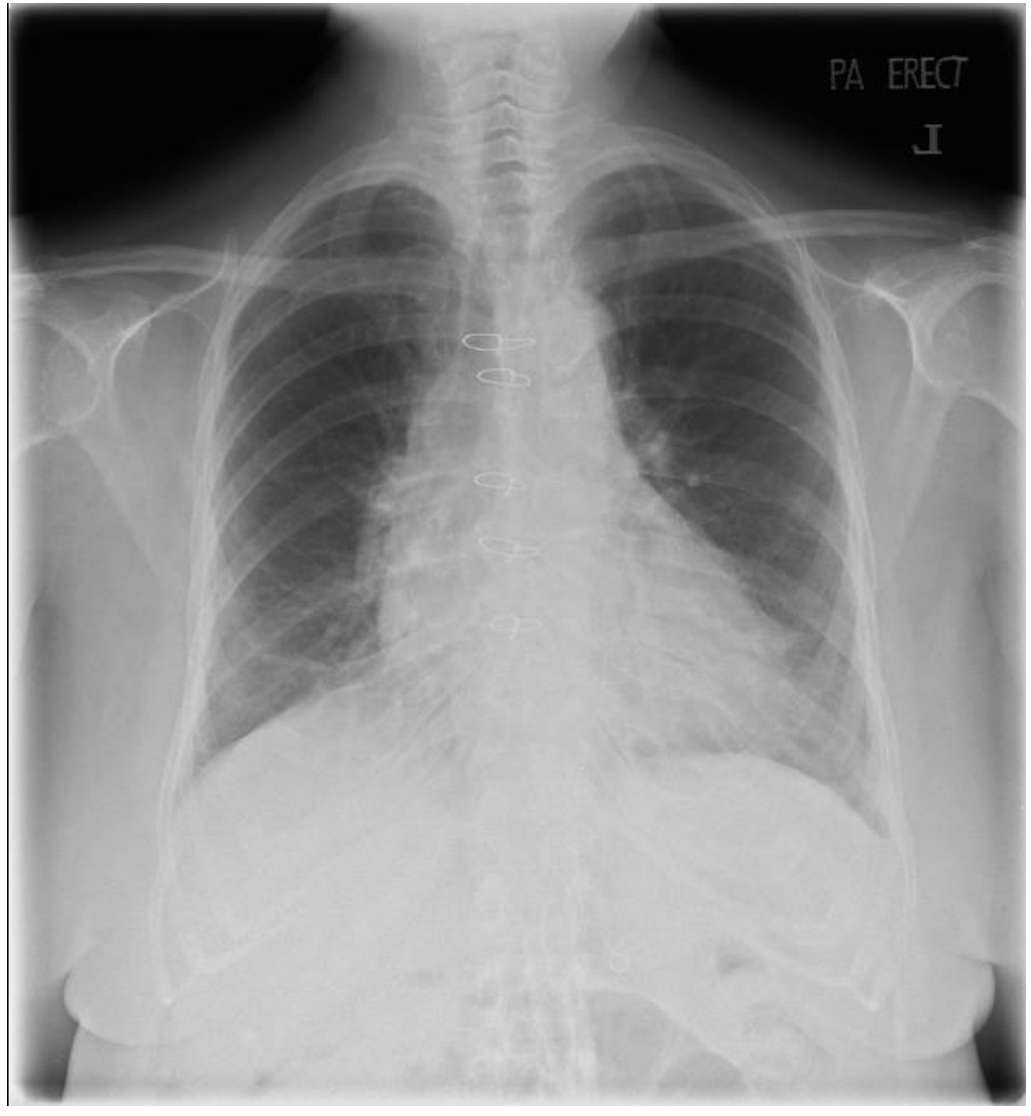
CTSP 4

Doctor, you have a new admission from ED due for clerking. Patient admitted for chest discomfort.

- Mdm Rabak 80 yo Malay Lady – speaks very limited English
- PMHx
  - HTN/HLD/DM
  - IHD – EF 60% no RWMA
    - Prev NSTEMI >10 years ago s/p CABG
- Current medications
  - Metfomin 500mg BD
  - Empaglifozin 25mg OM
  - Perindopril 4mg OM
  - Atorvastatin 40mg ON
  - Aspirin 100mg OM
- Vitals stable, afebrile. SpO2 95% on RA
- Via translator – "Doctor, chest pain – different to heart pain. Pain only happens when I cough"
- Further History
  - No exertional chest pain/decreased ET/orthopnoea/ankle swelling
  - No radiation and nature of pain different to previous angina
  - Cough x 3-4 days a/w sore throat and low grade fever
  - No other localizing signs of infection
- Examination
  - Not in respiratory distress
  - JVPNE
  - H: S1S2
  - L: Clear
  - A: SNT
  - Calves supple
  - Point tenderness over chest wall

What additional questions or bedside test would you like?





Hb 13.0 TW 9.0 (leukopenia) Plt 200
Ur 4.0 Na 138 K 4.0 HCO3 24.0 Cr 70
LFT NAD
Procalcitonin 0.09 CRP 50
UC9: Nitrites and leukocytes normal

Upper Respiratory Tract Infection!!

Upper Respiratory Tract Infection!!

DO NOT FORGET THE COVID19

COVID19 – suspect case definition

- Person with clinical signs and symptoms suggestive of pneumonia or severe respiratory infection with breathlessness AND within 14 days before onset of illness had travelled abroad (i.e. to any country outside of Singapore).
- OR
- Person with an acute respiratory illness of any degree of severity who, within 14 days before onset of illness had:
  - Been to any of the areas requiring heightened vigilance OR
  - Been to any hospital abroad; OR
  - Close contact with a case of COVID-19 infection.

- However, currently all patients with respiratory symptoms should be admitted to ARI (acute respiratory wards) for COVID19 swabs

What to do next?

- Wear appropriate PPE
- Manage underlying condition
- Update ward nurses
- Update on-call MO → Registrar
- Transfer to Acute Respiratory Infection Ward
- Update patient's family
  - Rationale
  - Will not be able to visit
  - Procedure – swab x 2 at least 24 hours apart

What PPE to wear if providing direct care?

1. N95 + eye protection + gown + gloves
2. N95 + gown + gloves
3. Surgical mask + gown + gloves
4. Surgical mask only
5. N95 only

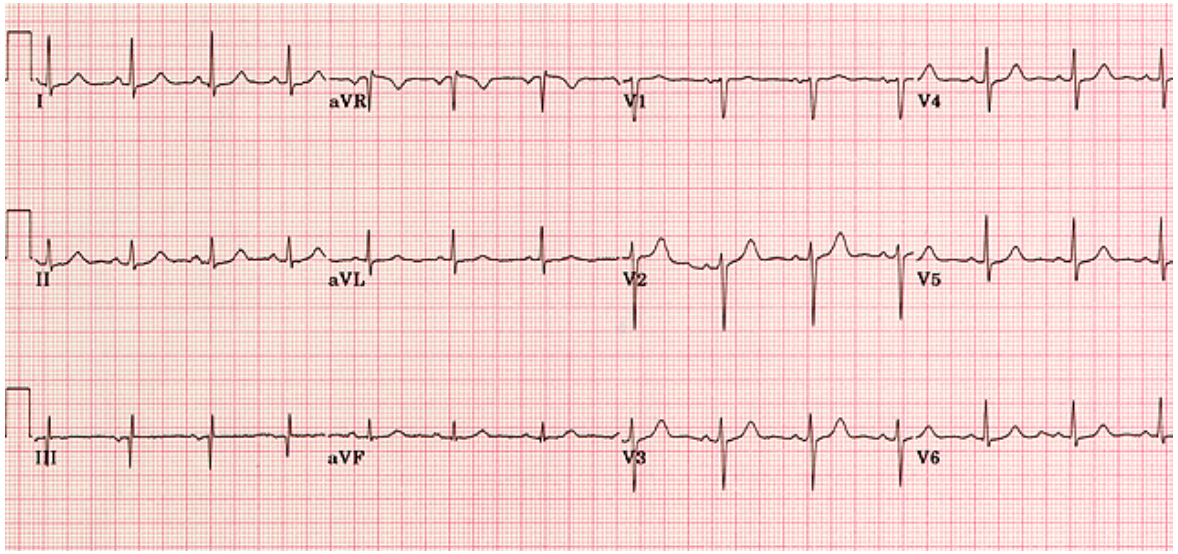
Pollev: select appropriate PPE

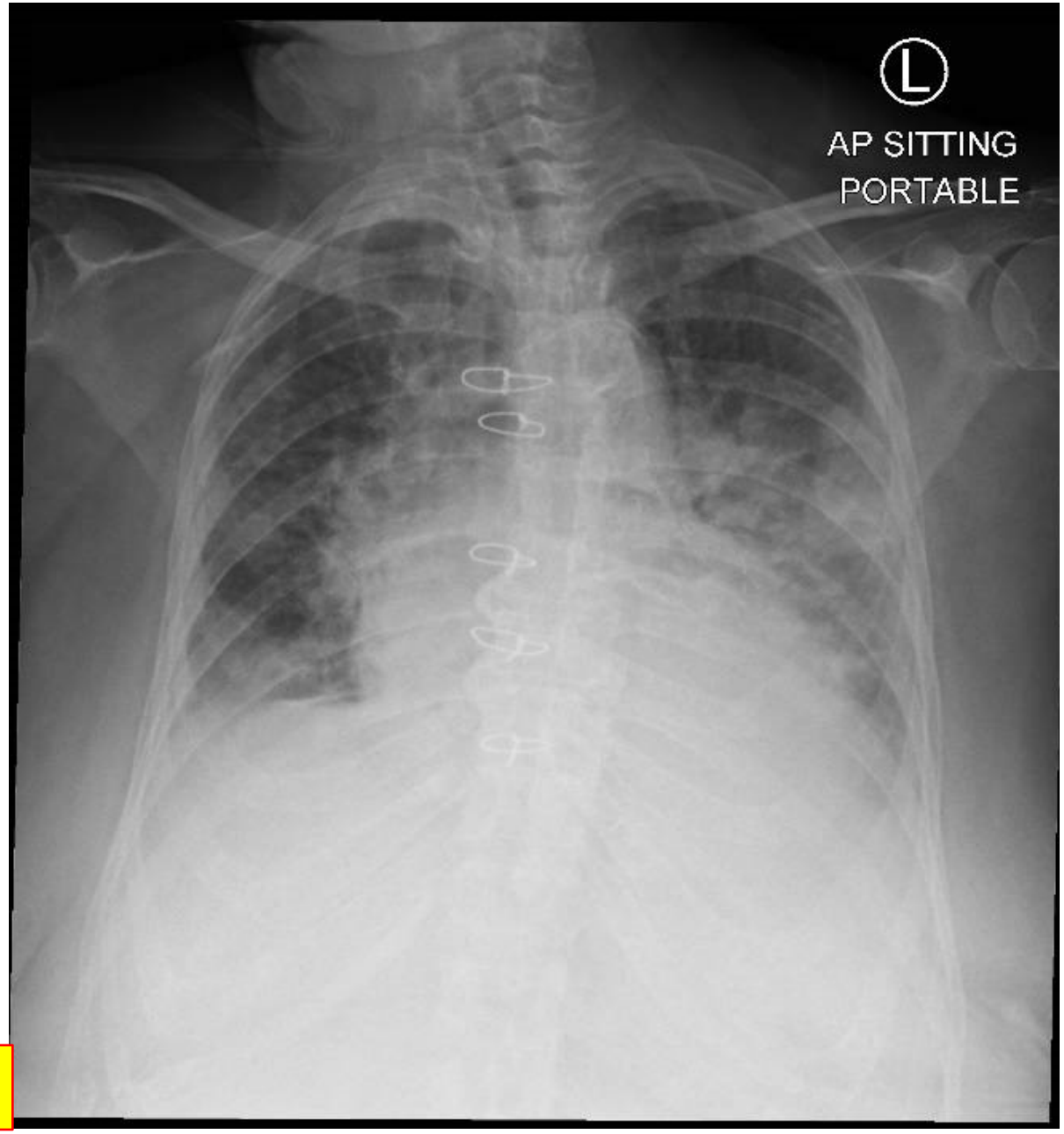
Doctor, Mdm Rabak in W63 Bed 23/1 was just transferred out from ARI ward after COVID19 swab x 2 negative. She is complaining of worsening SOB. SpO2 88% on RA. But now 90% on NP 4L

- Patient was feeling well in the morning.
- Started to feel more breathless prior to transfer
- BP 110/60 Temperature 38.3 HR 100 bpm
- O/E
  - Speaking short sentences
  - JVP elevated
  - H: S1S2
  - L: Right basal coarse creps
  - A: SNT
  - Calves supple

- Further Hx
  - No chest pain/diaphoresis
  - No more runny nose/sore throat
  - Not at increased risk of COVID19

Apart from FBC, UECr, blood cultures what investigations would you order?





ABG
pH 7.32
pCO2 34
pO2 100 on VM 0.50
HCO3 20

get 1 student to answer

Differential Diagnoses

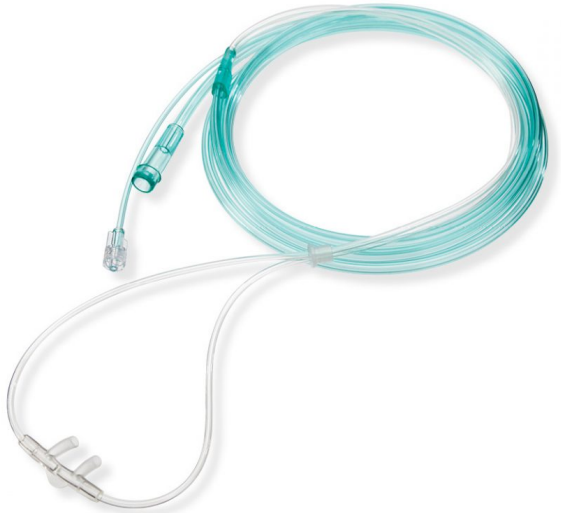
- Common causes
  - Infection – pneumonia
  - Inflammatory – ARDS/TRALI
  - Vascular – PE
  - Fluid – CCF (ACS)/CKD, massive pleural effusion
  - Pneumothorax

- Most of these can be ruled out with a CXR → important
- ABG to quantify severity of respiratory failure
- ECG TRO acute coronary event

Important Points

- Diagnosis: HAP +/- component of fluid overload
  - Need TRO concomitant ACS
- Recognize that this is potentially a sick patient + monitoring
  - Q1H paras, keep SpO2 > 94%
  - Keep patient NBM (Risk of aspiration and possible need for intubation)
  - Strict I/O charting. (CAN consider IDC insertion)
- Update senior
- Specific treatment
  - IV Lasix 40mg stat in view of fluid overload
  - IV tazocin (based on hospital guidelines)
  - Supplemental O2 therapy

Doctor which is the venturi mask?



Pollev: select venturi mask

LPM
24% 3
26% 3
28% 6
30% 6

System	Percent oxygen delivered*	Indications	Comments
Low flow nasal cannula (1 to 4 L/min)	25 to 40 percent (each increment of 1L increases FiO2 by 4%)	Use to deliver low-dose oxygen to spontaneously breathing patients	Percent oxygen delivered affected by respiratory rate, tidal volume, and extent of mouth breathing
Venturi mask	35 to 50 percent (setting adjustable)	To deliver more precise oxygen supplementation – especially wrt COPD patients	Percent oxygen delivered affected by mask fit and respiratory rate
Nonrebreather mask	65 to 95 percent	Use to deliver high-dose oxygen to spontaneously breathing patients	Tight mask fit required to deliver higher concentrations of oxygen
Bag and Mask	95 to 100 percent, with reservoir	Use to provide assisted ventilation and oxygen	For patients who cannot provide their own respiratory effort.

O2 Targets

- For most patients a target saturation of 94–98% is acceptable
- For patients with chronic Type 2 respiratory failure, 88–92%

*Arterial oxygen content (CaO_2)
CaO_2 (mL O_2/dL) = (1.34 x hemoglobin concentration x SaO_2) + (0.0031 x PaO_2)

Repeat ABG

Previous ABG

- pH 7.32
- pCO2 34
- pO2 100 on VM 0.50
- HCO3 20
- PF ratio: 200

Repeat ABG

- pH 7.25
- pCO2 45
- pO2 100 on NRM
- HCO3 18
- PF ratio: 100 to 125
  - NRM 0.8 to 1.0 FiO2

select one person to interpret

Further management

- Recognize worsening PF ratio
- Recognize rising pCO2 – patient may be tiring out
- Will probably need intubation and mechanical ventilation
- Stabilize patient and update MO

- What are the indications for intubation?
  1. Unable to protect airway
  2. Unable to oxygenate
  3. Unable to ventilate
  4. Anticipation of rapid deterioration which will lead to respiratory failure

Objectives

- Chest pain
  - Rule out red flags
  - Interpretation of troponin
  - Identifying STEMI
    - Do not stop at looking for one abnormality
  - Management of ACS
- COVID19
  - When to suspect
  - Appropriate disposition
  - Appropriate PPE
- Desaturation
  - Recognize that this is a potentially an emergency
  - Common causes and evaluation
  - Supplemental O2 devices
  - PF ratio

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