Called to see

PATIENT WITH……

COMMON

- PAIN – CHEST, HEAD, BACK, ABDOMEN, LIMB
- HYPOTENSION
- SHORTNESS OF BREATH
- ALTERED LEVEL OF CONSCIOUSNESS
- FEVER

How do we know when someone is sick – vital signs

- HEART RATE
- BLOOD PRESSURE
- PULSE OXIMETRY – OXYGEN SATURATION
- RESPIRATORY RATE
- LEVEL OF CONSCIOUSNESS – GLASGOW COMA SCORE
- TEMPERATURE
- BLOOD GLUCOSE

How do we know when someone is sick? – EXAM: look, listen, feel

- Cardiovascular: colour (pale, red); palpate pulse (weak/strong; regular/irregular; ?only central – BP 80); cap refill; compensation: heart rate (beware drugs, spinal injury, vagal stimulation;pain/anxiety); blood pressure (pulse pressure widens with vasodilation; late sign)

- Respiratory: colour (blue); rate (sensitive but not specific – pain, anxiety; acidosis); pattern (accessory muscles, tripoding, scaphoid, cheyne-stokes, paradoxical); auscultation (symmetry, added – wheeze, stridor, creps, rubs)

EXAM continued

- Neurological – GCS (6+5+4=15; coma <9); focal signs (pupils, motor); bilateral signs (spinal); meningism
- Abdomen – pulsatile mass; peritonism; localised tenderness
- Skin: temperature; colour, hydration, rash, needle marks, swelling, tenderness, subcutaneous emphysema

VITAL HISTORY

- PATTERN OF VITAL SIGNS
- REASON FOR ADMISSION
- INTERVENTIONS/OPERATIONS
- PREVIOUS REVIEWS
- MEDICATIONS
- PAST MEDICAL/SURGICAL
- RECENT INVESTIGATIONS
- TREATMENT LIMITATION ORDERS

VITAL INVESTIGATIONS

- ECG
- CXR
- VBG
- U/A - MSU
- BLOOD CULTURE
- BHCG
- G&H
- POCUS

VITAL TREATMENT

- OXYGEN
- IV FLUIDS/BLOOD
- GLUCOSE
- ANALGESIA
- ANTIBIOTICS
- BRONCHODILATORS
- NIPPV

VITAL ACTIONS

- CALL FOR HELP
- DO NO HARM
- EXAMINE THE PATIENT
- MONITOR IMPACT OF INTERVENTIONS
- KEEP AN OPEN MIND – AVOID PREMATURE CLOSURE AND OTHER COGNITIVE BIASES
- GO BACK TO THE BEGINNING AND KEEP SUMMARISING.
- DOCUMENT
- HANDOVER

NON-TRAUMATIC CHEST PAIN – vital diagnoses behind the assessment

- Acute myocardial infarction
- Aortic dissection
- Pulmonary embolus
- Tension pneumothorax
- Pericarditis with tamponade

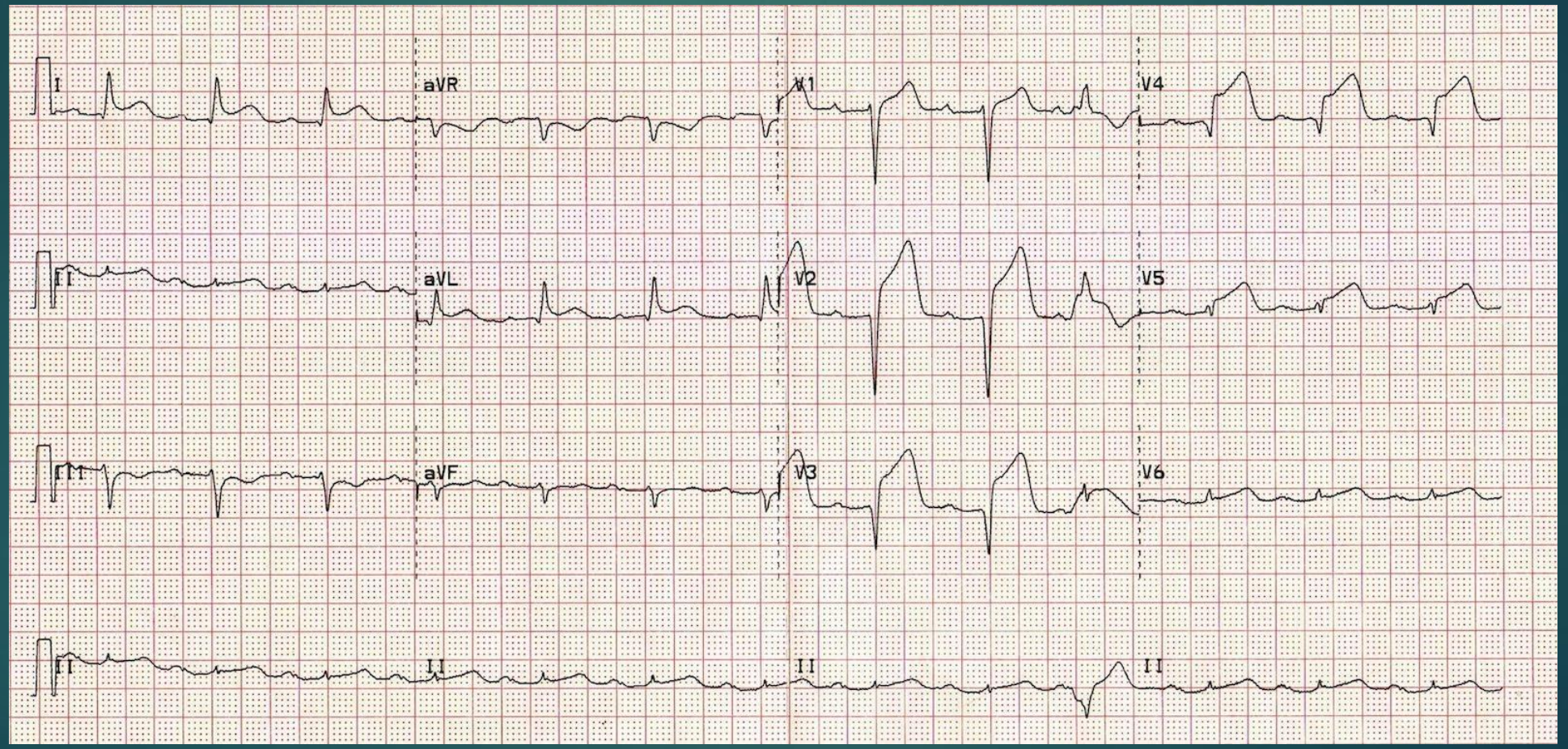
Chest pain - Assessment

- Vital signs – what is blood pressure - ? Low or high, symmetric?; what is heart rate - ? Low or high; oxygen sats; fever
- ECG - ? STEMI; ? STEMI equivalent; serial
- Exam: peripheral perfusion; new murmurs; signs of heart failure; symmetry and added lung sounds, JVP, oedema – generalised or localised); body habitus (e.g. Marfan's)
- History – nature and time course pain; added symptoms; previous disease/investigations/interventions; risk factors for all possible diagnoses; old ECGs
- Investigations – CXR, Troponin(s), D-dimer, CRP, CT (aorta, PA); Ultrasound (heart, lungs, aorta)

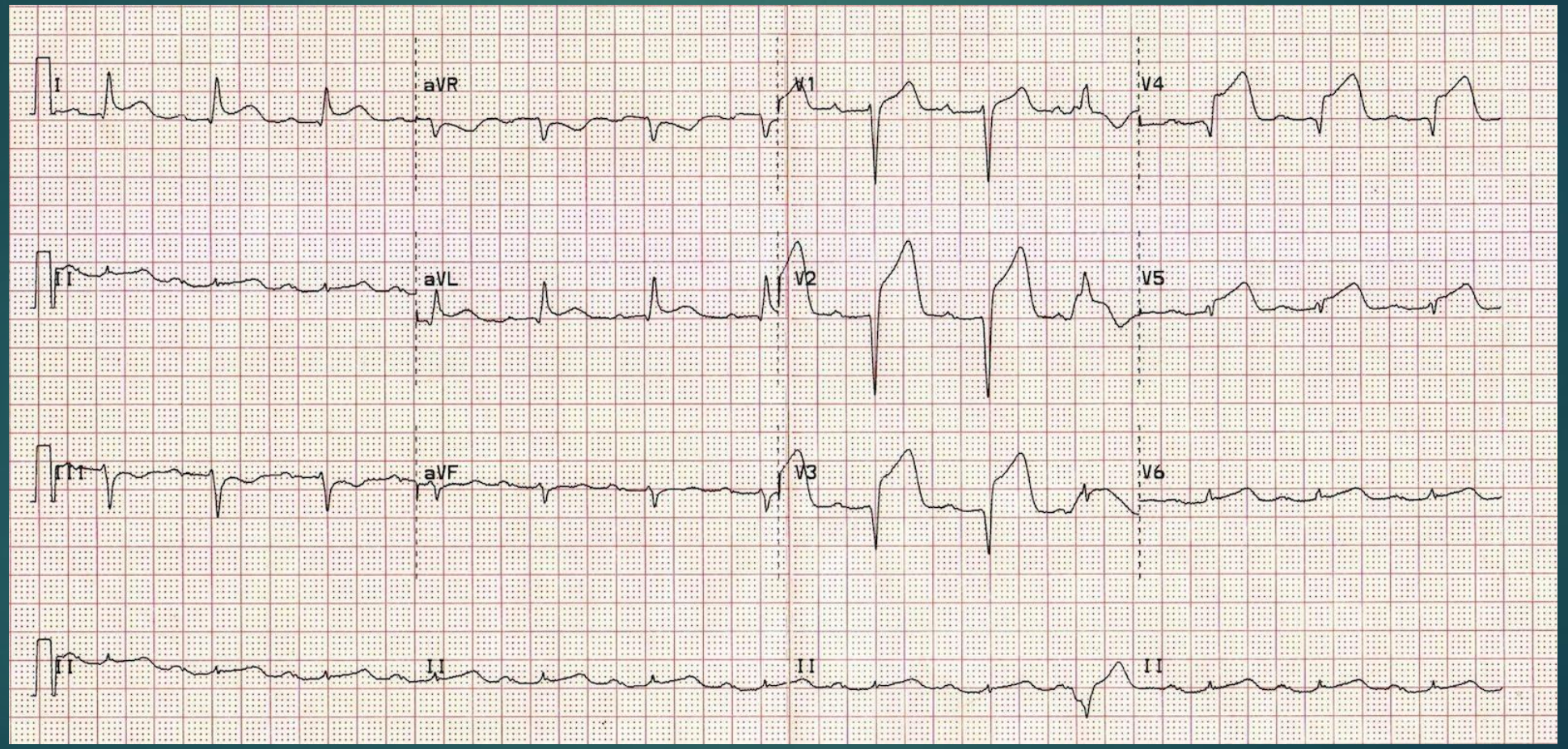
ECG Questions

- What about the ECG worries me?
- What is the clinical context ?
- What are the vital signs ? – what is the blood pressure and what is the hear rate?
- What does the ‘old’ one look like?
- Do I need to act now?
- Do I need help ?

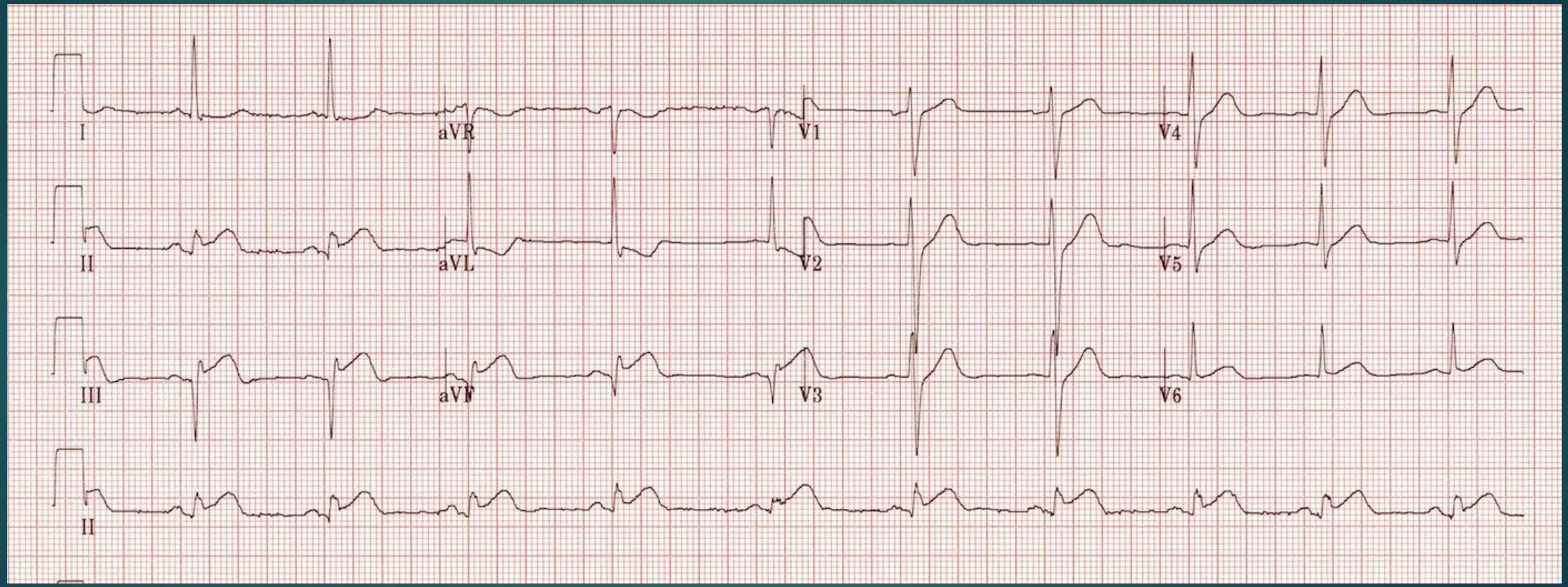
60 year old female with chest pain



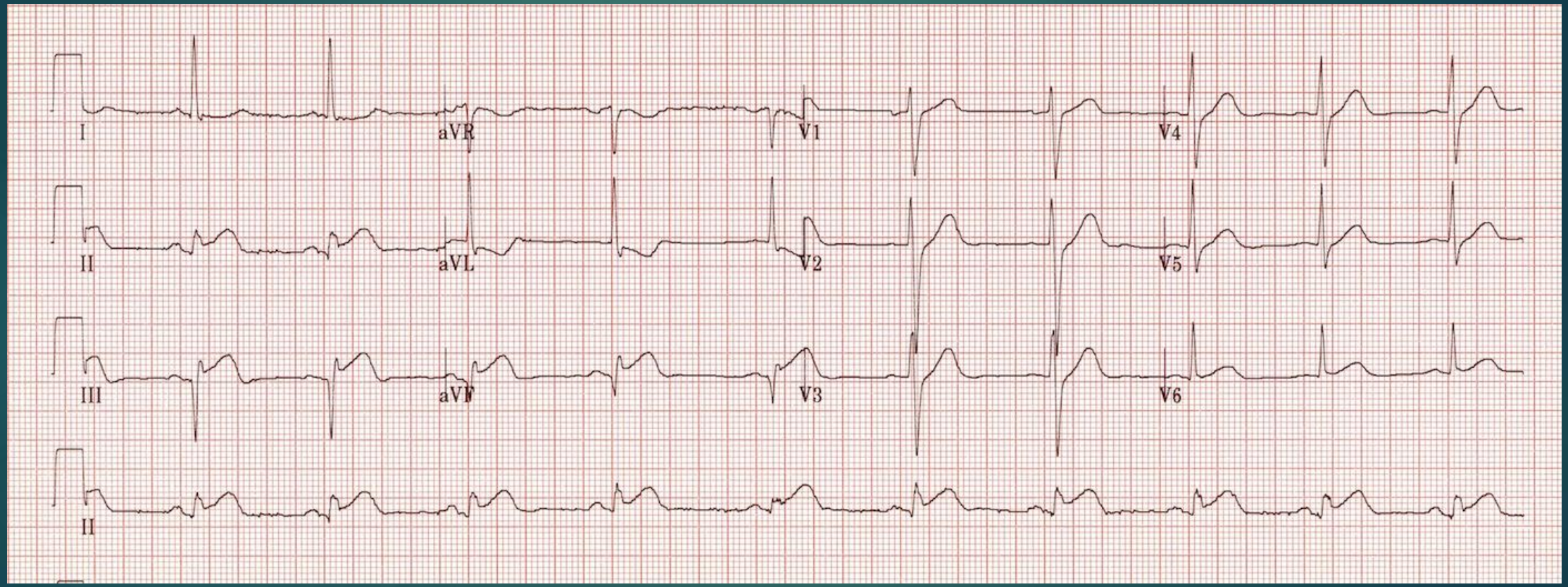
Evolving anterior STEMI



30 year old male with epigastric pain



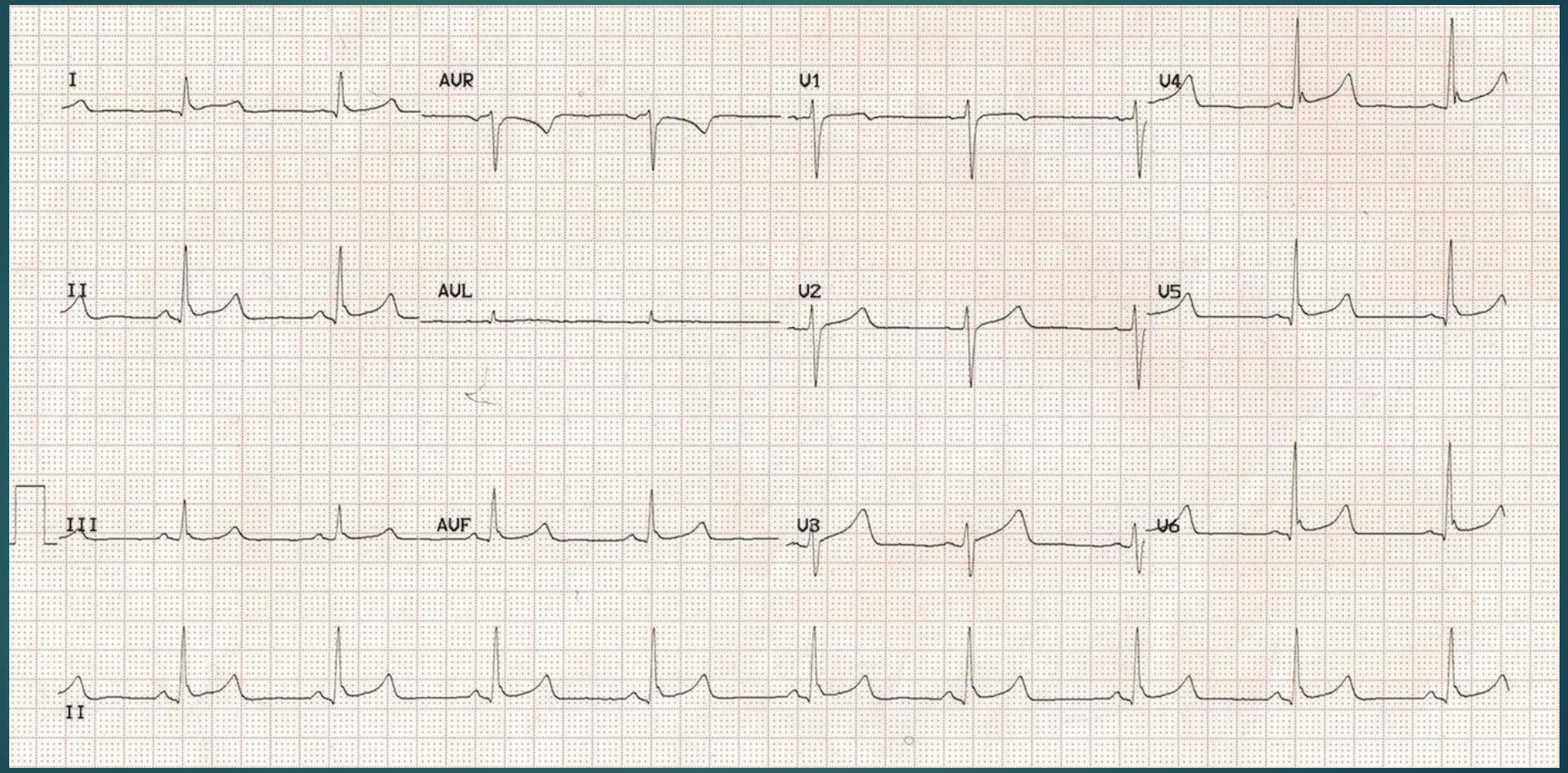
Inferior STEMI



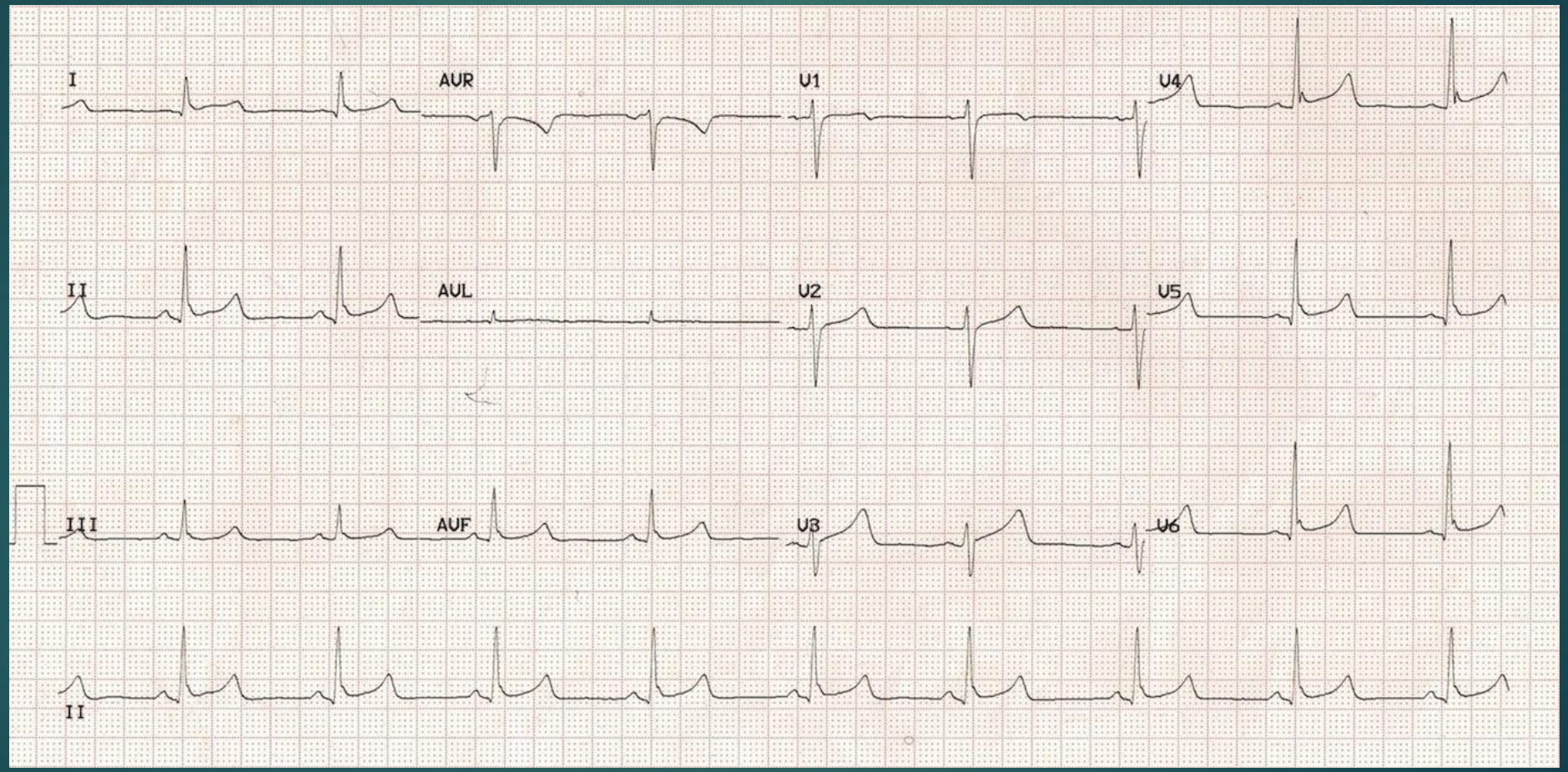
Causes of ST elevation

- Acute myocardial infarction
- Coronary vasospasm (Printzmetal's angina)
- Pericarditis
- Benign early repolarization
- Left bundle branch block
- Left ventricular hypertrophy
- Ventricular aneurysm
- Brugada syndrome
- Ventricular paced rhythm
- Raised intracranial pressure

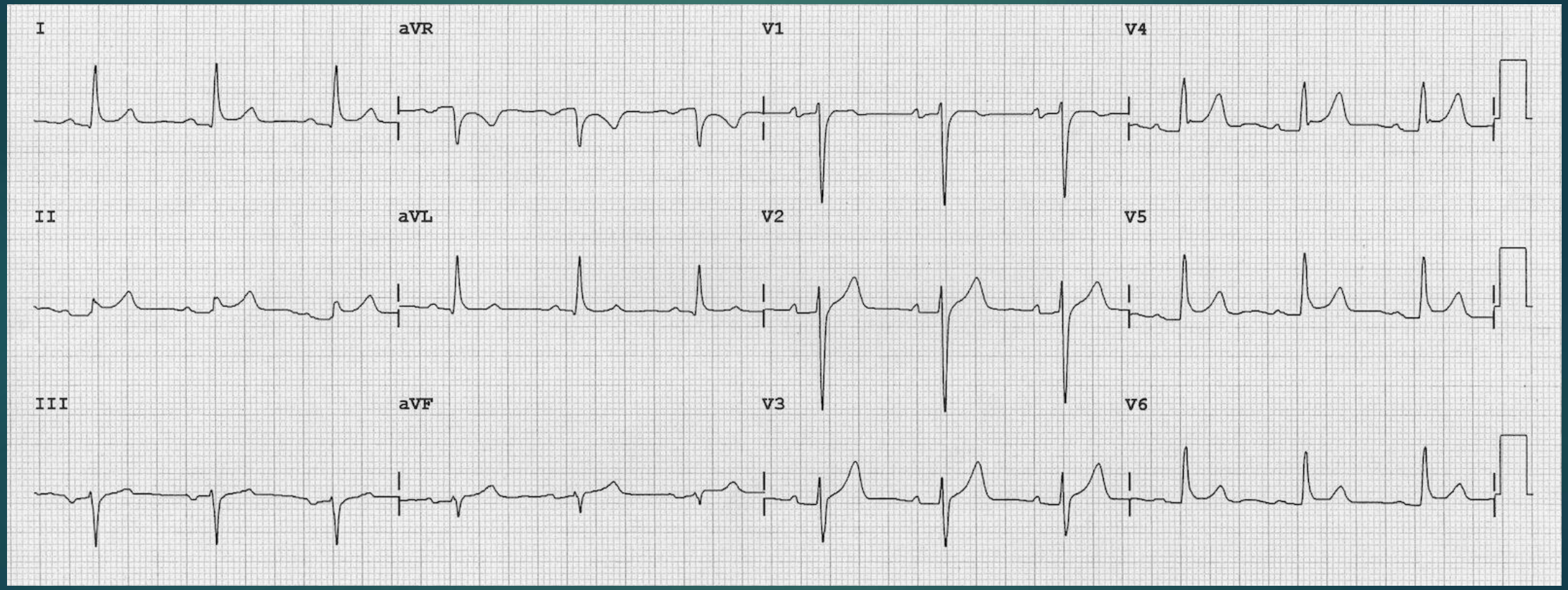
23 year old male with chest pain



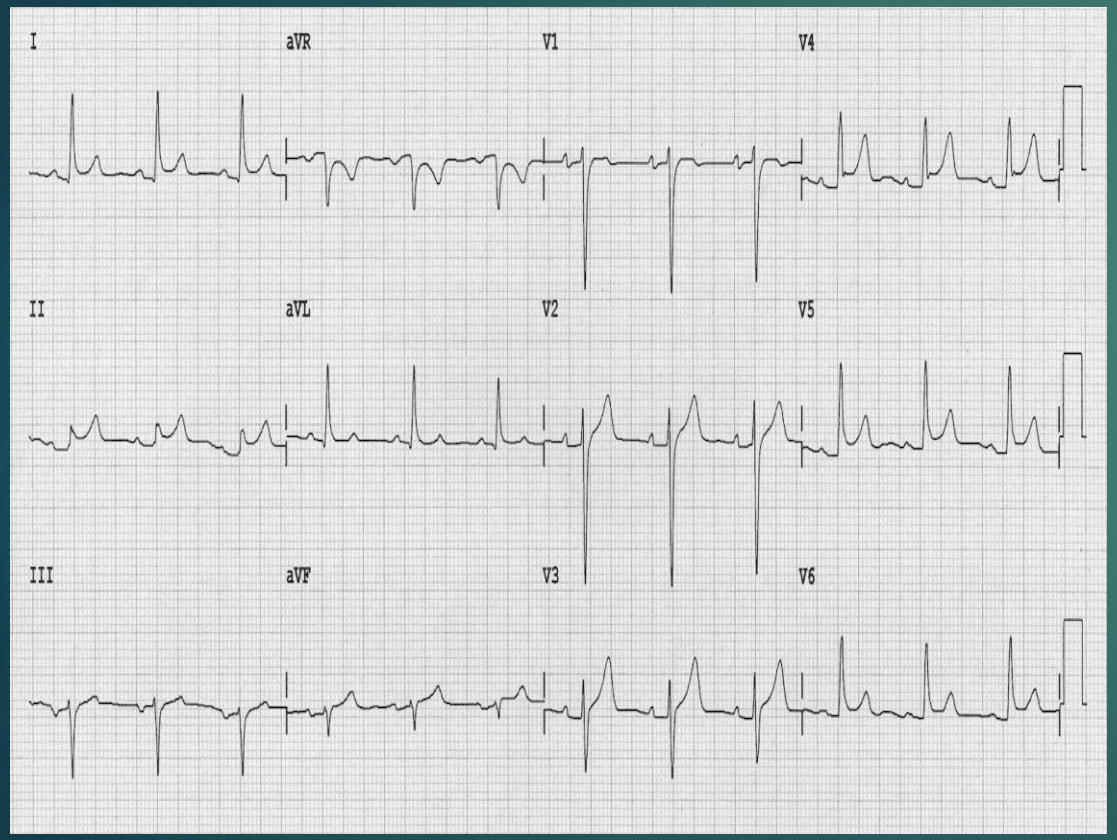
Benign early repolarisation



Does this patient need to go to the cath lab?

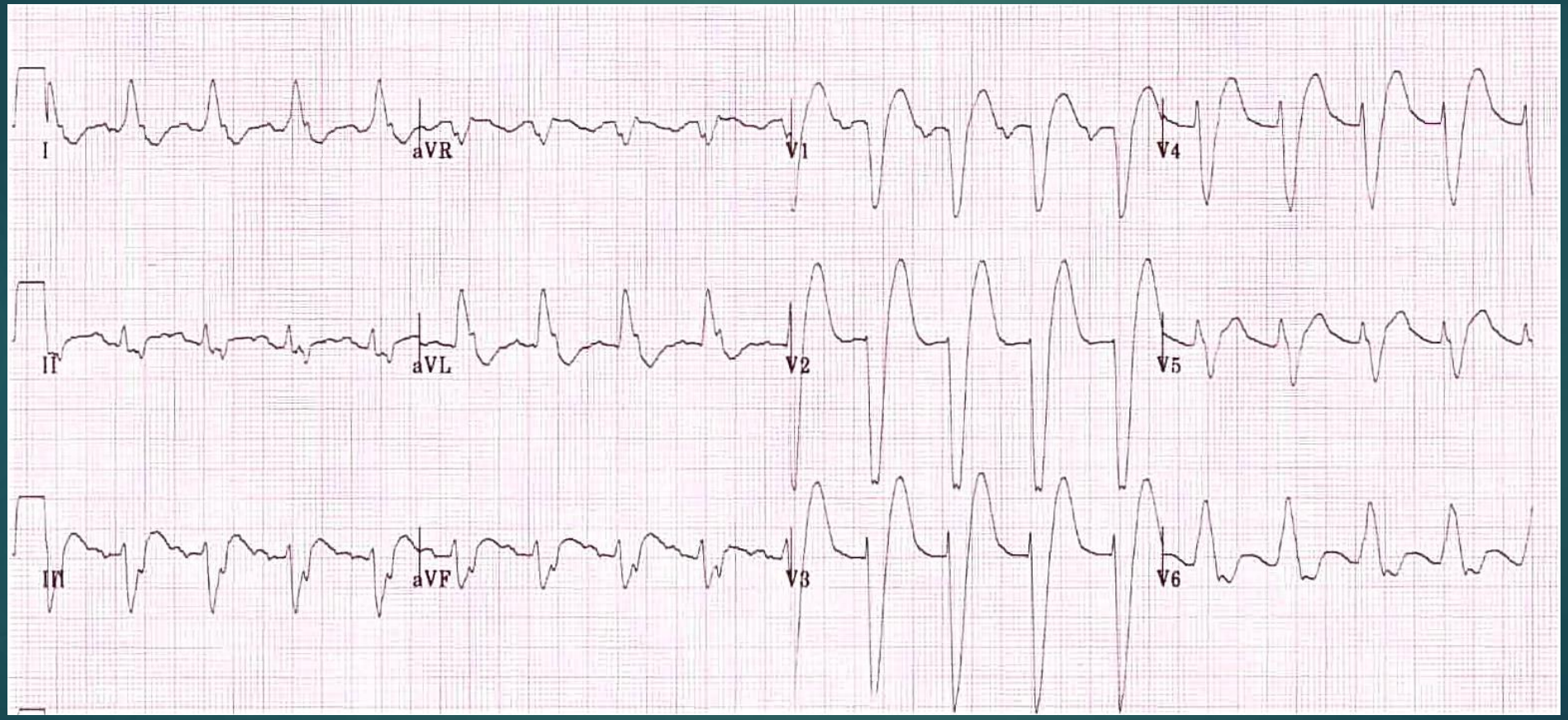


Pericarditis

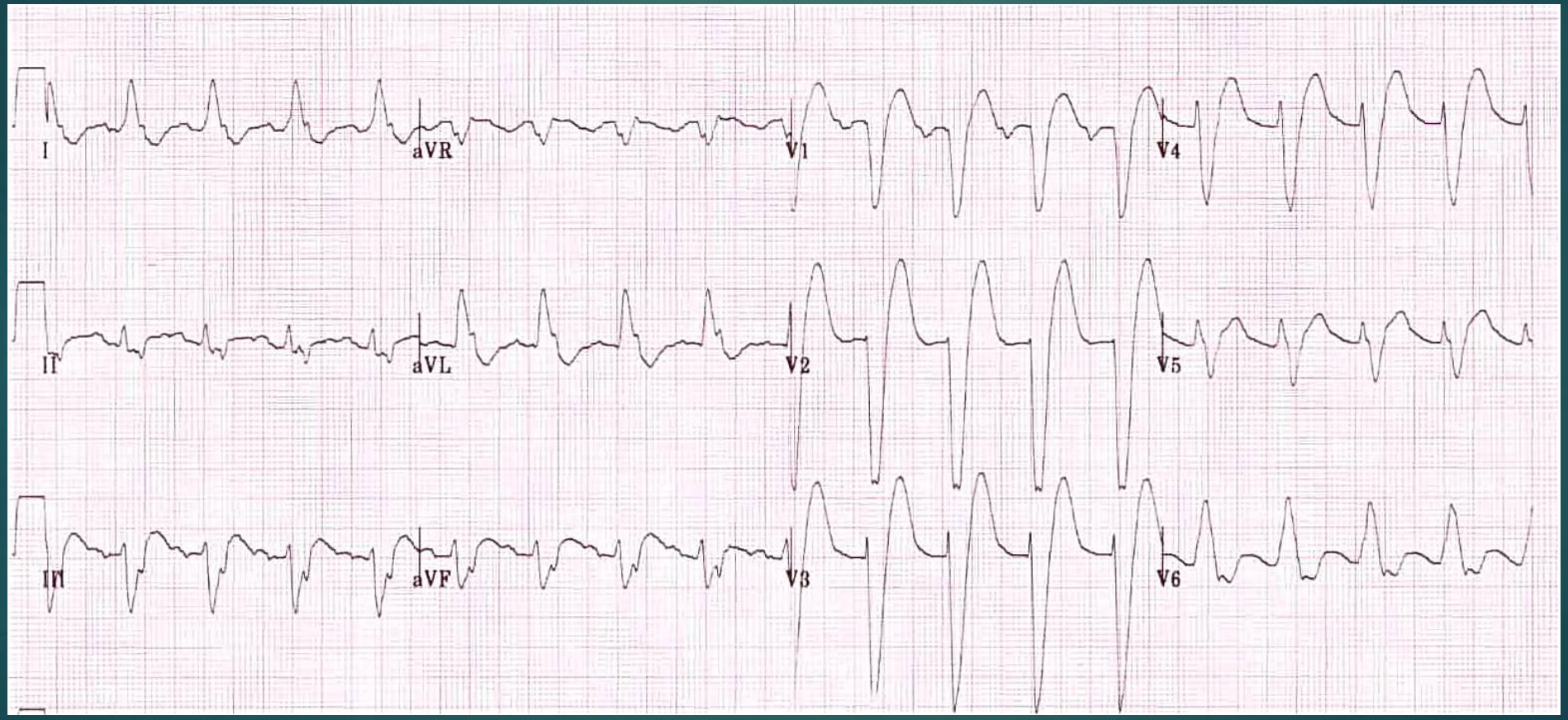


- PR depression
- Widespread concave ST elevation

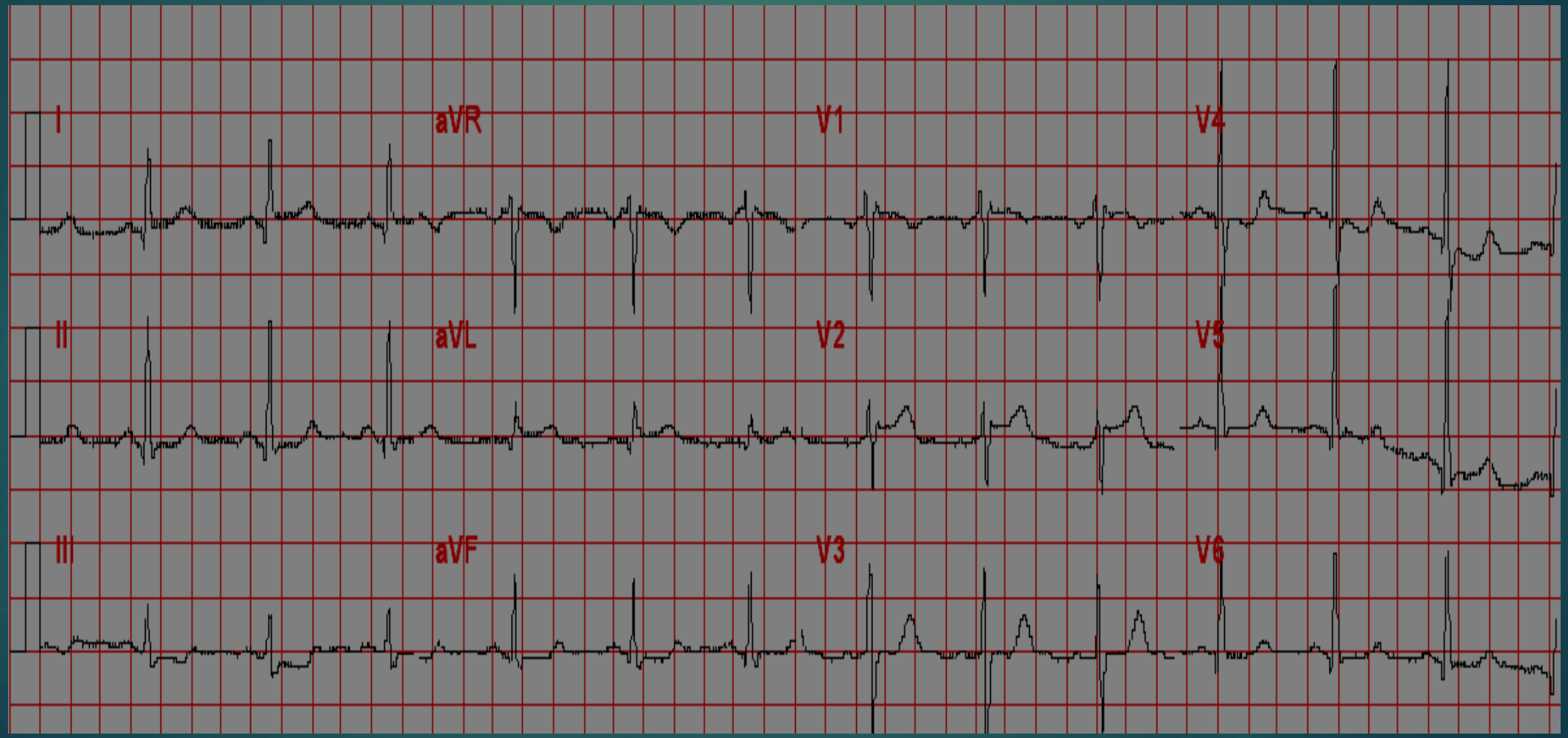
Does this patient need to go to cath lab?



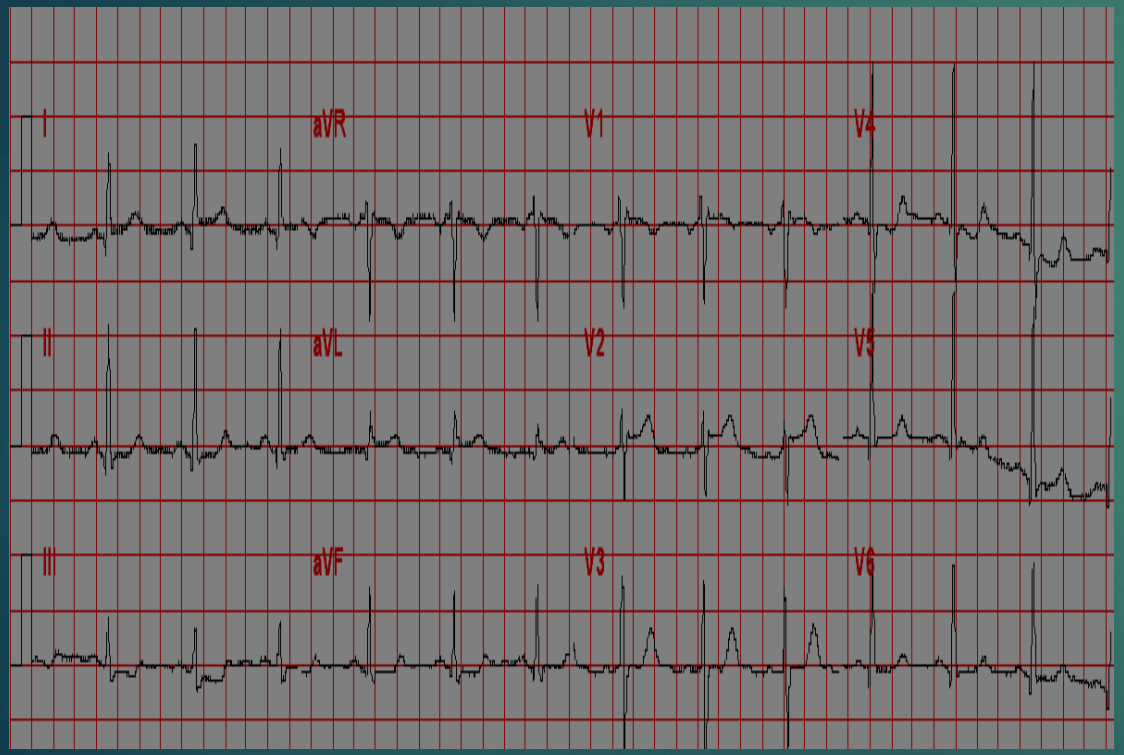
Left bundle branch block



Does this patient need to go to cath lab?

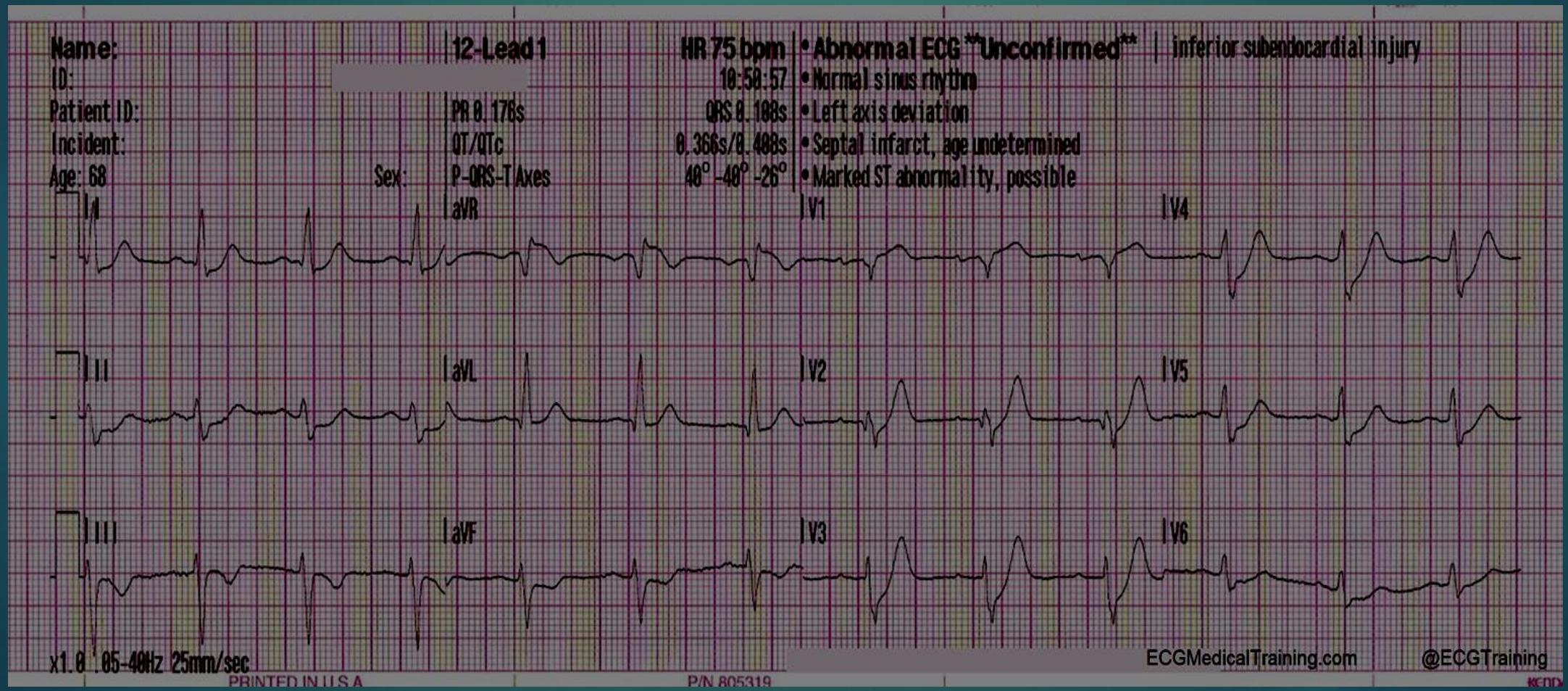


Blocked 1st diagonal branch LAD

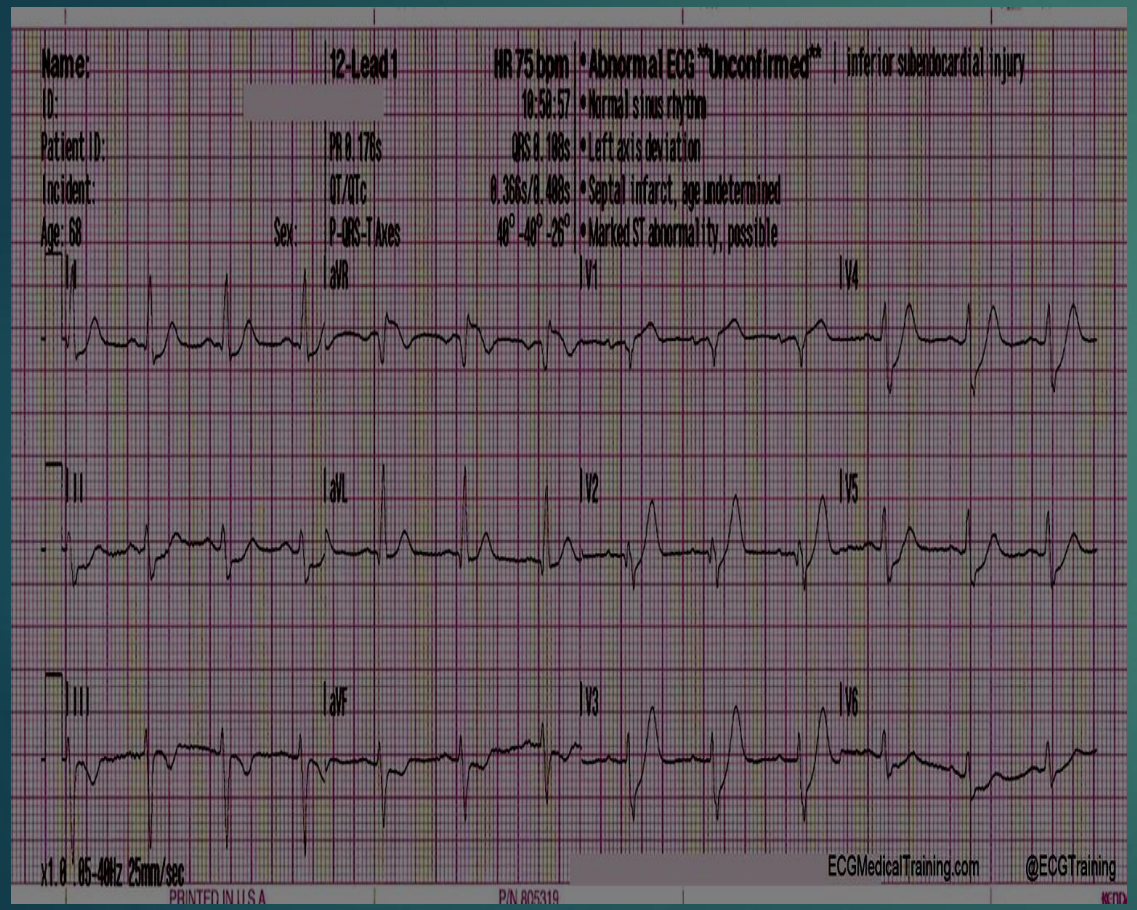


- STE and upright Ts in **aVL** and **V2**
- St depression with inverted Ts in III and aVF
- Large portion LV in jeopardy

Does this patient need to go to cath lab?

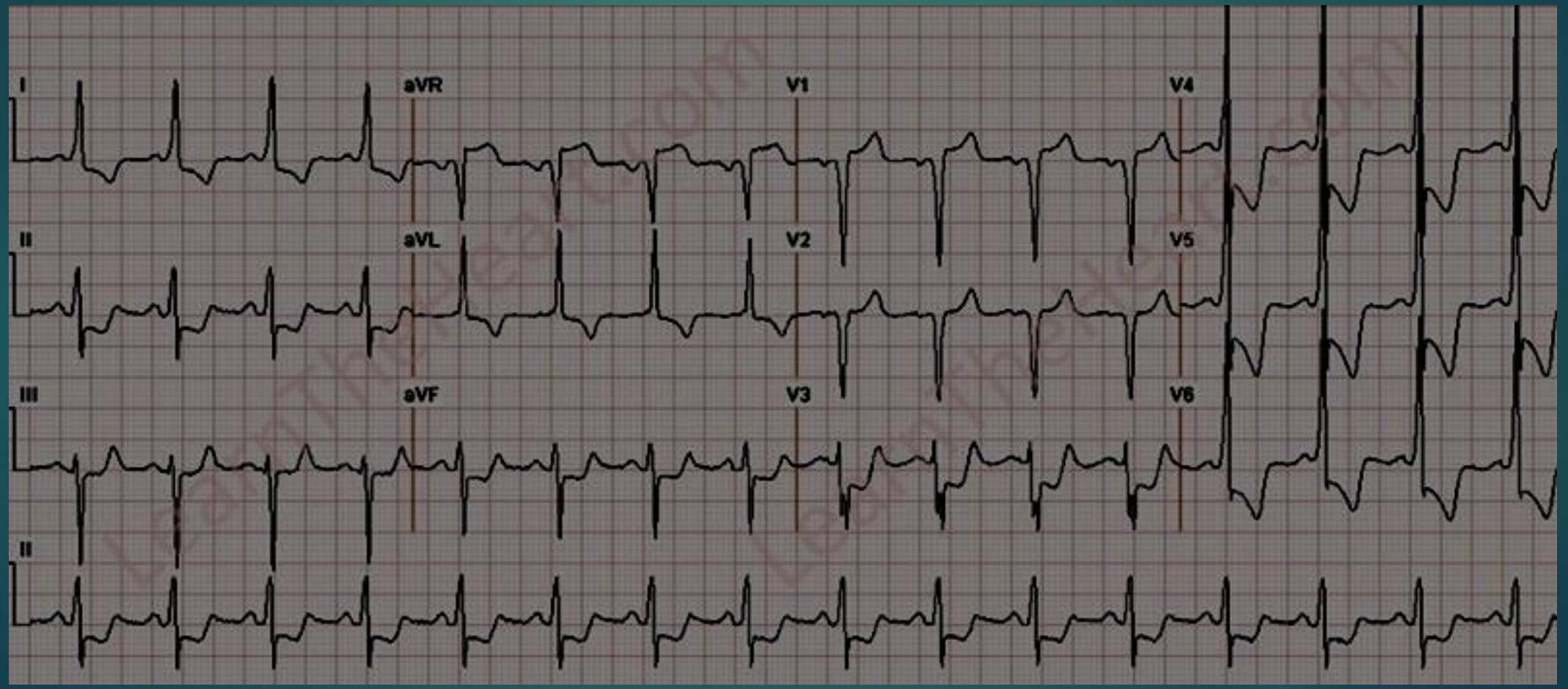


“de Winter’

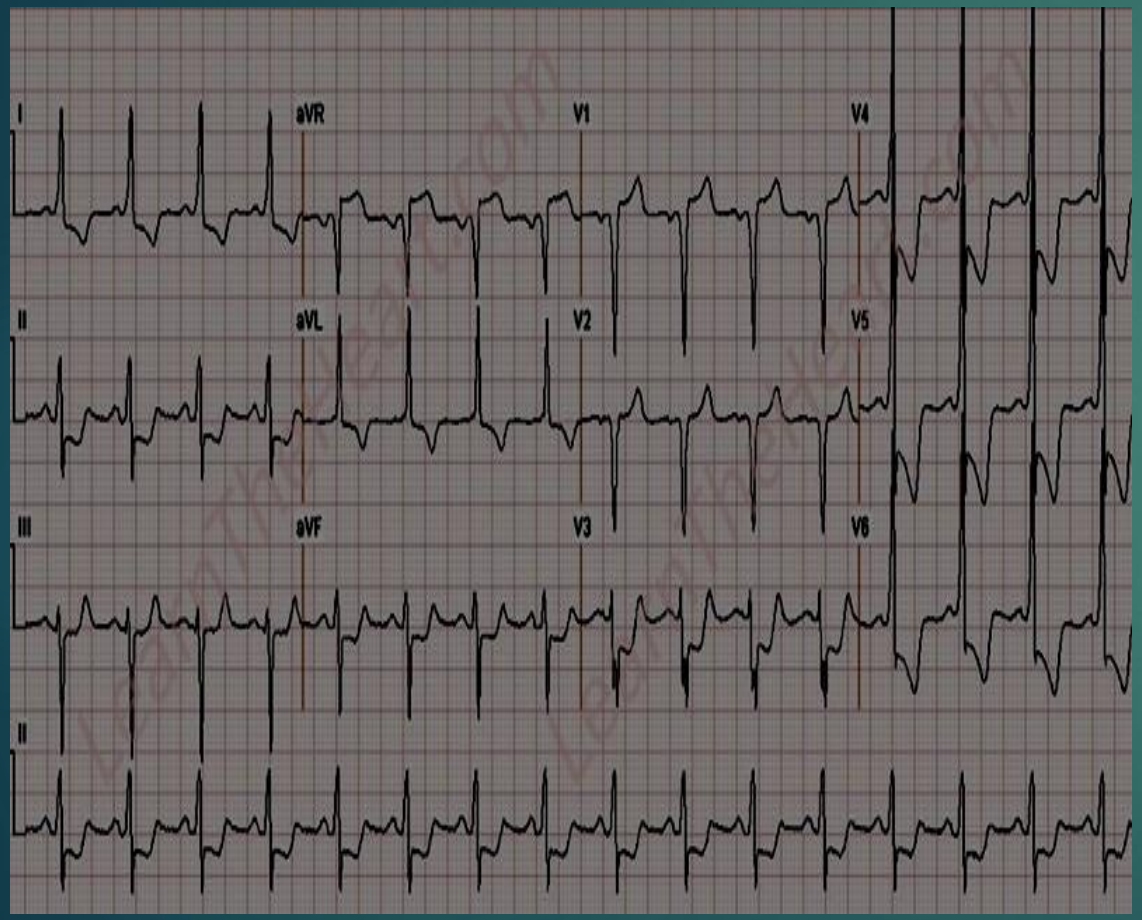


- Upsloping ST depression V1-4 with tall prominent T waves in same leads
- **STE aVR**
- Associated with proximal LAD occlusion and significant risk for anterior wall STEMI

Does this patient need to go to cath lab?

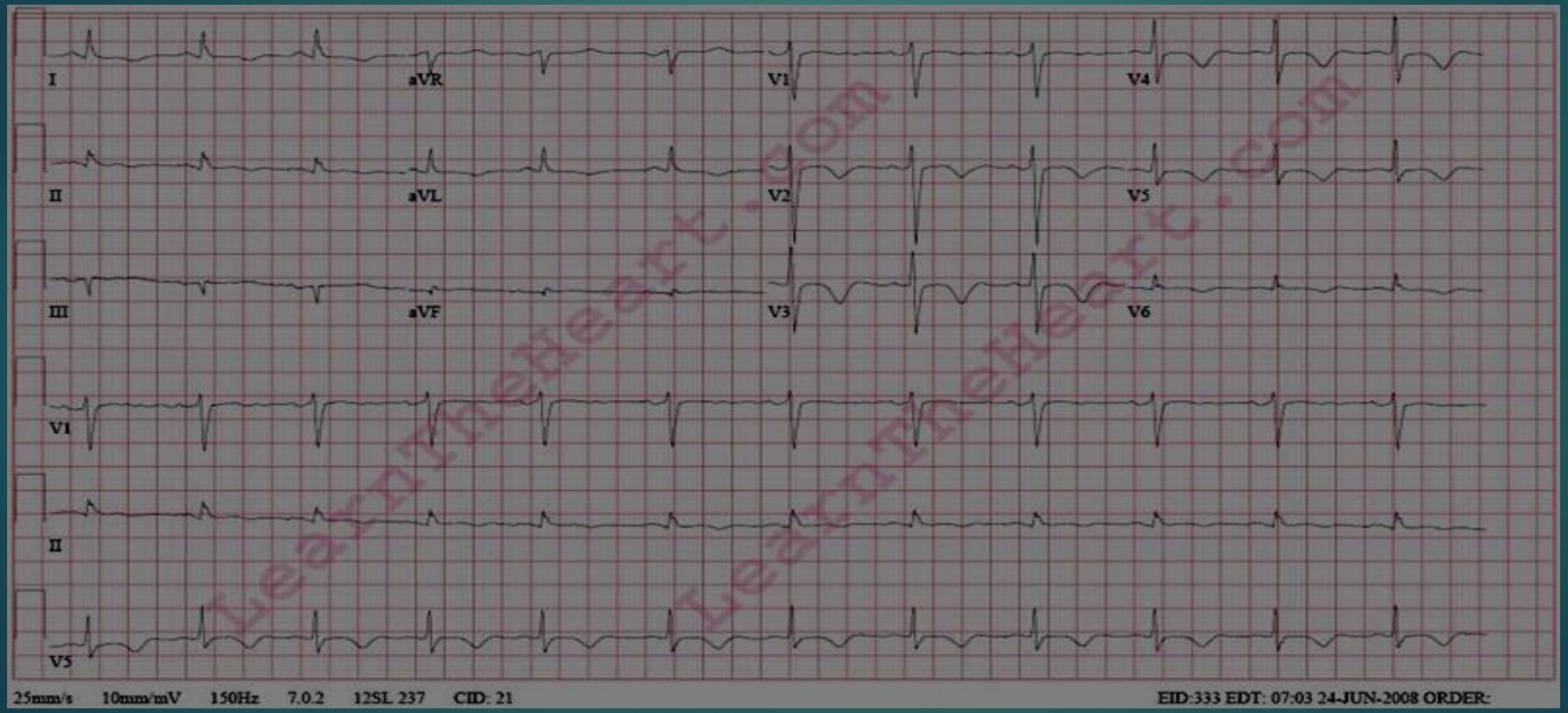


Left Main Coronary Occlusion



- STE in aVR and/or widespread ST-depression
- LMCA supplies about 75% LV myocardium
- Large anterolateral STEMI is likely if patient doesn't arrest

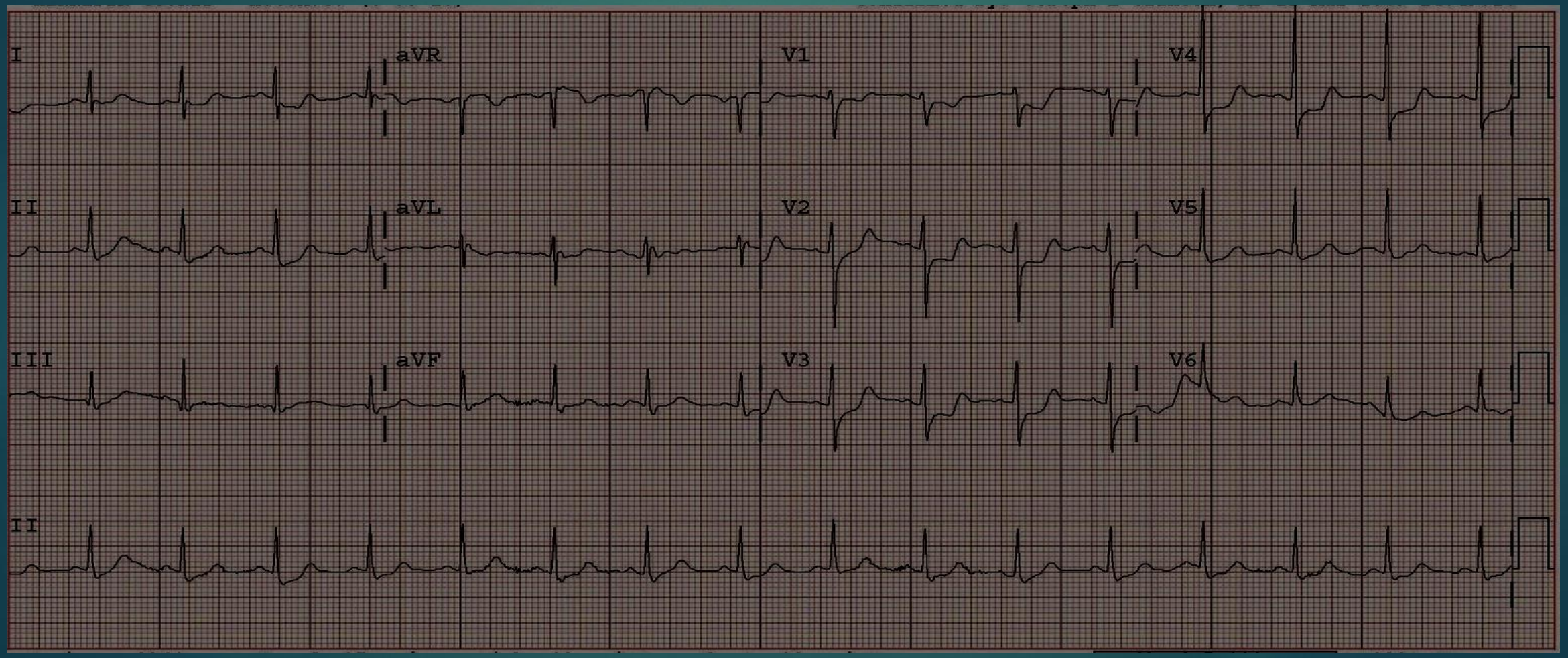
Does this patient need to go to the cath lab?



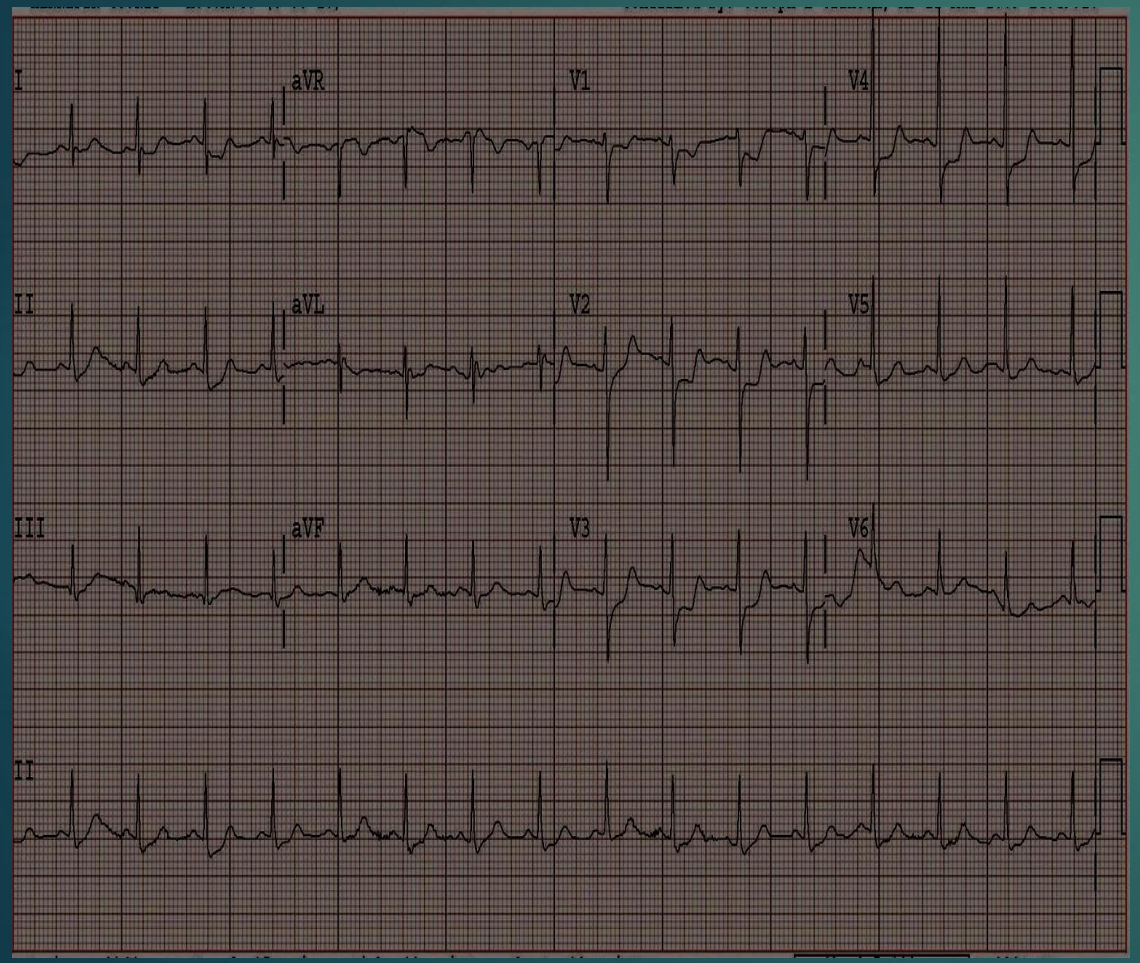
Wellens syndrome

- Deeply inverted and symmetric T waves in V1-4 OR biphasic Ts in V1-4
- Represents occlusion proximal LAD, jeopardising anterior segment LV
- Most patients may be pain free with this ECG but evolving into precordial STE with pain
- Provocative testing can be disastrous

Does this patient need to go to the cath lab?

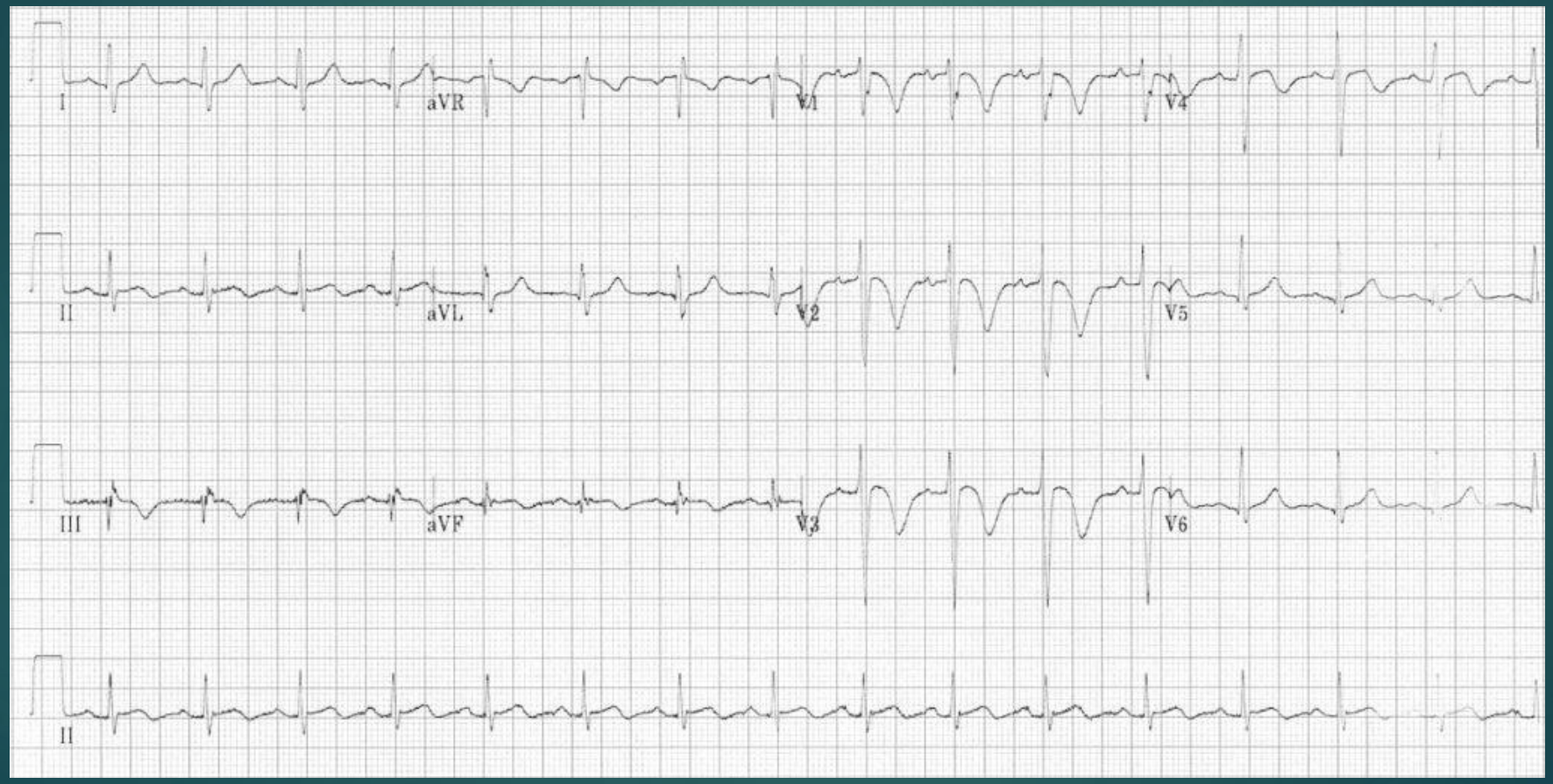


Posterior wall MI



- Horizontal or flat ST depression V1-3, with prominent R waves in V1-2 and upright Ts in V1 and 3
- R to S ratio > 1 in lead V2
- To confirm do posterior leads and look for STE

Does this patient need to go to the cath lab?



Pulmonary embolus

- Sinus tachycardia.
- Simultaneous T-wave inversions in the anterior (V1-4) and inferior leads (II, III, aVF
- *Negative T waves in leads III and V1 were observed in only 1% of patients with ACS compared with 88% of patients with Acute PE (p less than 0.001). The sensitivity, specificity, positive predictive value, and negative predictive value of this finding for the diagnosis of PE were 88%, 99%, 97%, and 95%, respectively. In conclusion, the presence of negative T waves in both leads III and V1 allows PE to be differentiated simply but accurately from ACS in patients with negative T waves in the precordial leads*

HYPOTENSION - PEARLS

- PERIPHERAL PULSES = ENOUGH TO PERFUSE VITAL ORGANS
- CHECK TREND; CHECK BOTH ARMS; CHECK MANUAL – particularly if it doesn't fit with clinical appearance
- What's the pulse – tachy=compensation; brady=vagal stimulation (unless on blockers); What's the temperature (cold or hot)
- History: In hospital, common causes will be hypovolemia, sepsis, cardiogenic, medications
- Exam: hydration (mucous membranes, skin turgor, urine output, input, drainage), sources of infection, heart failure, bleeding, rash
- Obstructive – TPtx (PPV, COPD); PT (post-infarct or cardiac surgery, malignancy, sepsis)
- Anaphylaxis – usually medications; contrast; food

Hypotension pearls continued

- Investigation – VBG (Hb, electrolytes, Lactate); Cultures for sepsis; X-match for bleeding; BHcG (female); ECG; CXR
- Having a provisional diagnosis is important but unless floridly overloaded, bolus IV crystalloid usually ok – 250-500mls
- Reassessment critical
- Early antibiotics if sepsis suspected
- Steroids if Adrenal not working
- POCUS in ED

Shortness of breath PEARLS

- Vitals – oxygen sats (look at trend) – what FiO2?; RR (sensitive but not specific) – fast (pathology, fear, pain, acidosis) or slow (drugs, CNS); what is BP? What is temperature?
- History – in hospital, common causes will be lung (atelectasis post surgery; infection; asthma; COPD; pulmonary oedema; chronic - interstitial, fibrosis; PE) sepsis from other causes; metabolic; pain; anxiety; anemia; anaphylaxis
- Exam – respiratory effort (use accessory muscles, tripoding); colour; auscultation; cardiac
- Asthma/COPD – bad: unable to talk, quiet chest, failing respiratory effort – exclude pts
- Pulmonary oedema – not all that wheezes is asthma – listen again after bronchodilator for creps

Shortness of breath continued

- Investigations – VBG, CXR, Spirometry (after covid goes away)
- Interventions: Titrated Oxygen (aim for sats >90 unless chronically hypoxic) – if becoming sleepy, hypercapnic; if confused, hypoxic
- Posture – sit up unless hypotensive
- Bronchodilators if any wheeze
- Hypertensive pulmonary oedema – nitrates, Lasix – discuss first
- NIPPV – bipap – need help
- Early antibiotics if sepsis
- Monitor success interventions

Altered level of consciousness - pearls

- Vitals: GCS; BP; oxygen sats; **blood glucose;** temp
- History – common causes in hospital – medications; hypoglycaemia; CNS (seizure, intracranial event – bleed, thromboembolic, infection); sepsis; other endocrine/metabolic
- Exam: overall level of consciousness with GCS (best response) and focal neurological deficit (worst response) – pupils, motor response; signs trauma
- Investigations: BSL; VBG; CT scan (urgent in presence new focal signs); EEG
- Interventions: glucose; oxygen; thiamine; narcan; coma position; IDC

Sepsis - pearls

- Vitals – all - ? Shocked – very sick or old may be hypothermic; other things cause fever (heat, malignancy, endocrine, CNS)
- History – symptoms, source; community or hospital acquired
- Exam - ? Source – common: urine, lung, skin, intra-abdominal, CNS, spine, heart, device
- Investigations: VBG (serial; lactate>4); cultures (blood, urine, sputum, swab, line); CXR; CT; LP; POCUS
- Interventions: oxygen (if hypoxic); IV fluids; antibiotics (within 1 hour); steroids if indicated;
- Advanced – inotropes, source control