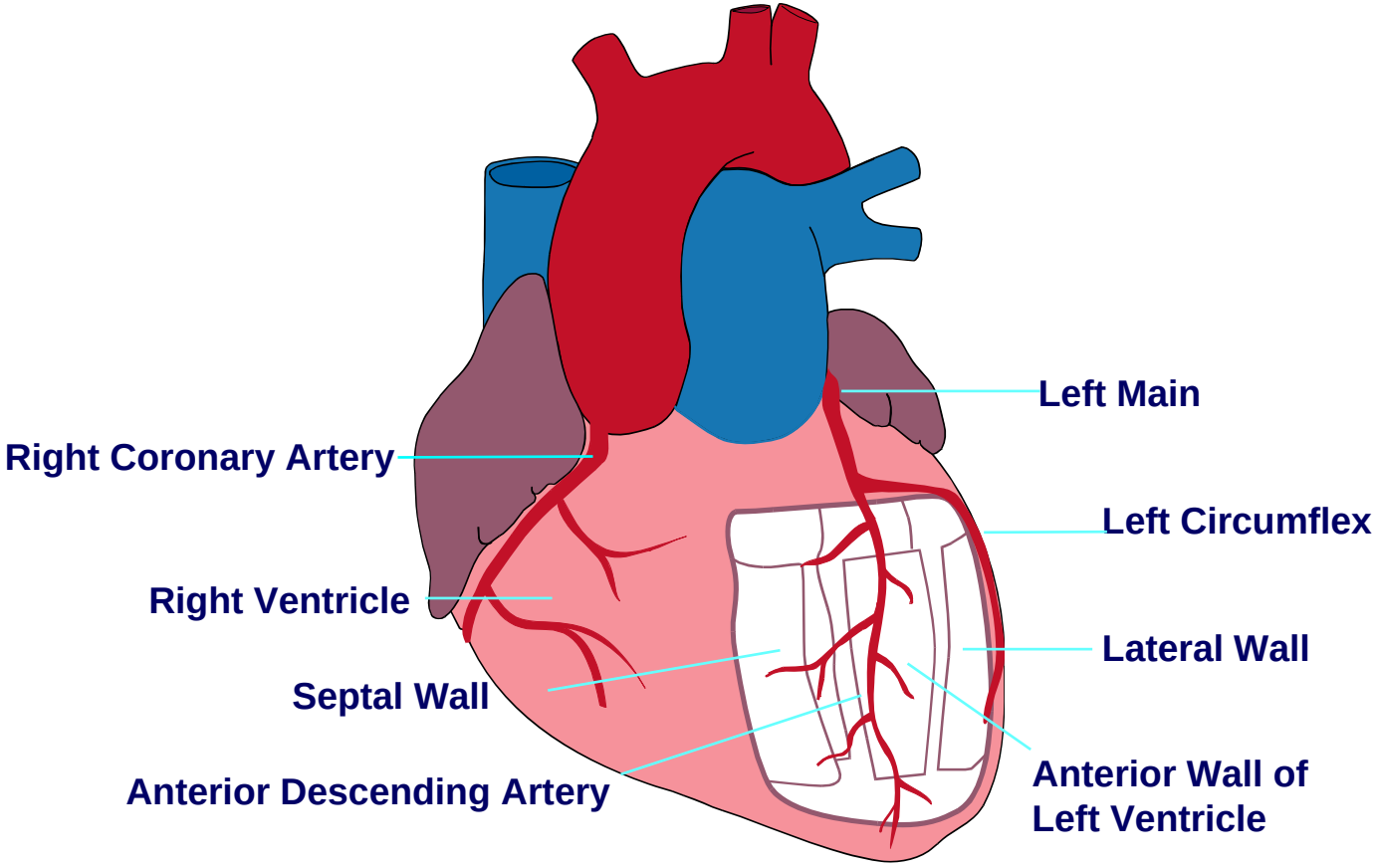
12 Lead ECGs:

Ischemia, Injury & Infarction Part 2

McHenry Western Lake County EMS

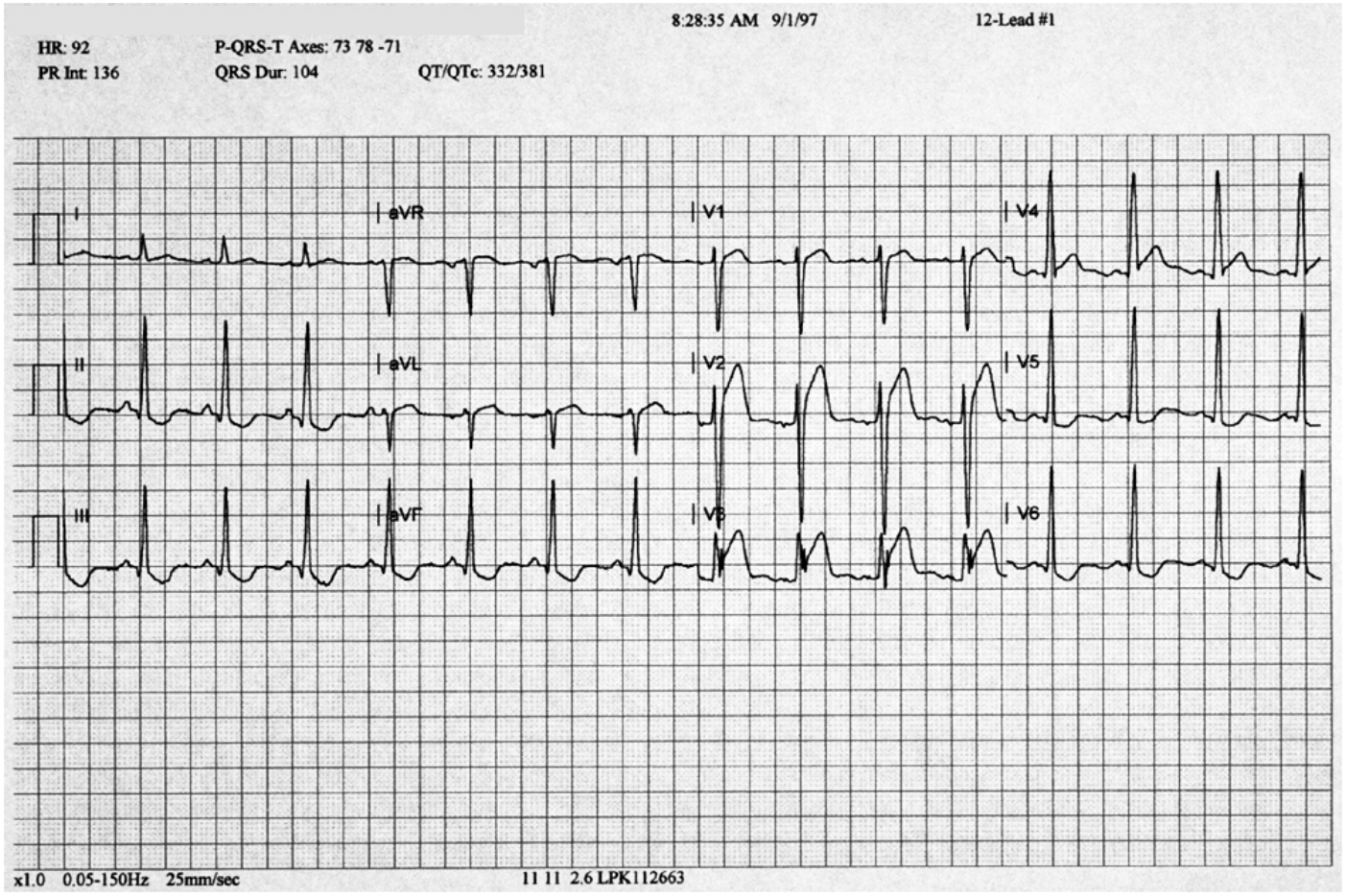
Localization:
Left Coronary Artery



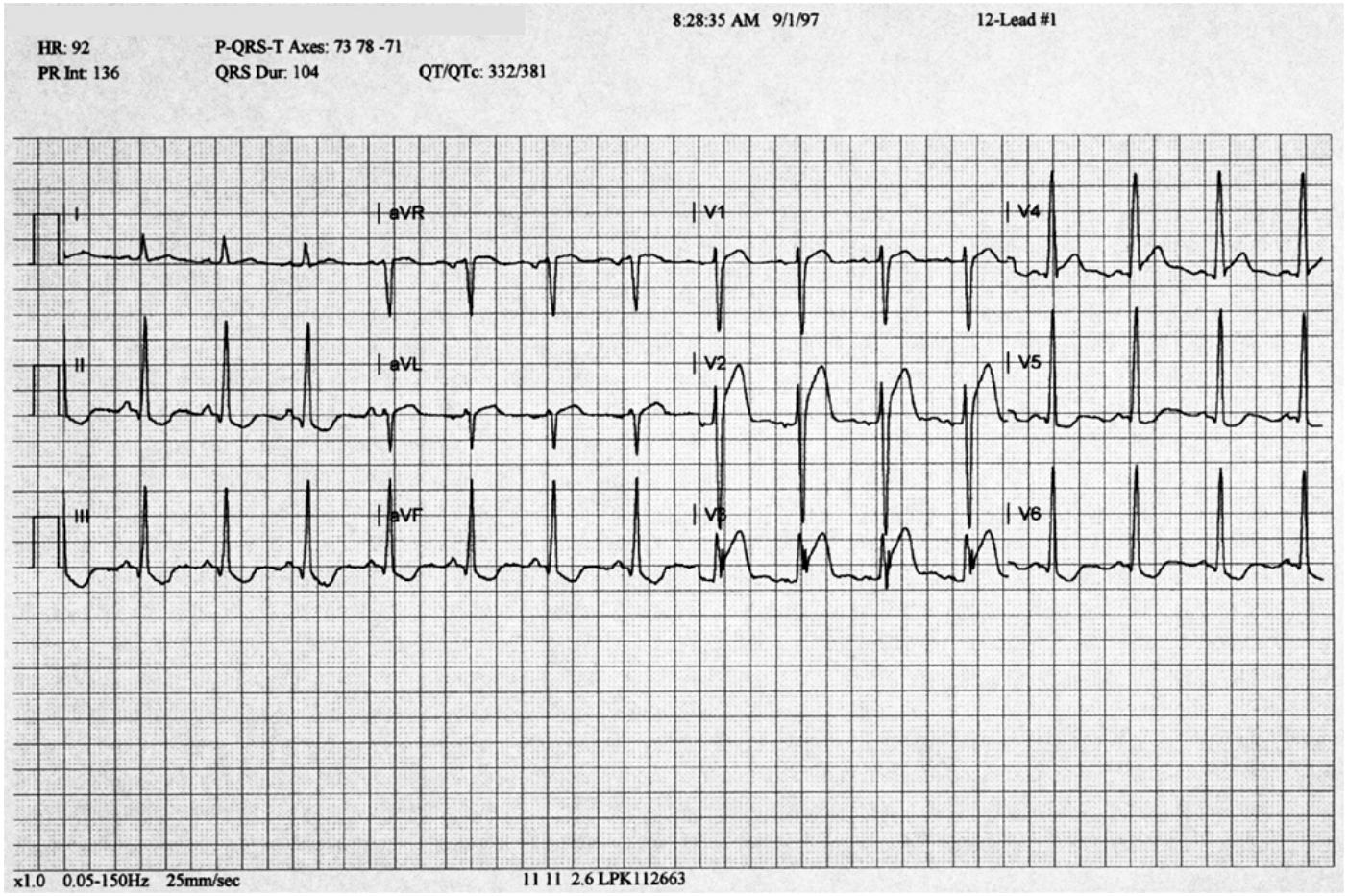
Localization: Left Coronary Artery (LCA)

- Left Main (proximal LCA) occlusion
  - Extensive Anterior injury
- Left Circumflex (LCX) occlusion
  - Lateral injury
- Left Anterior Descending (LAD) occlusion
  - Anteroseptal injury

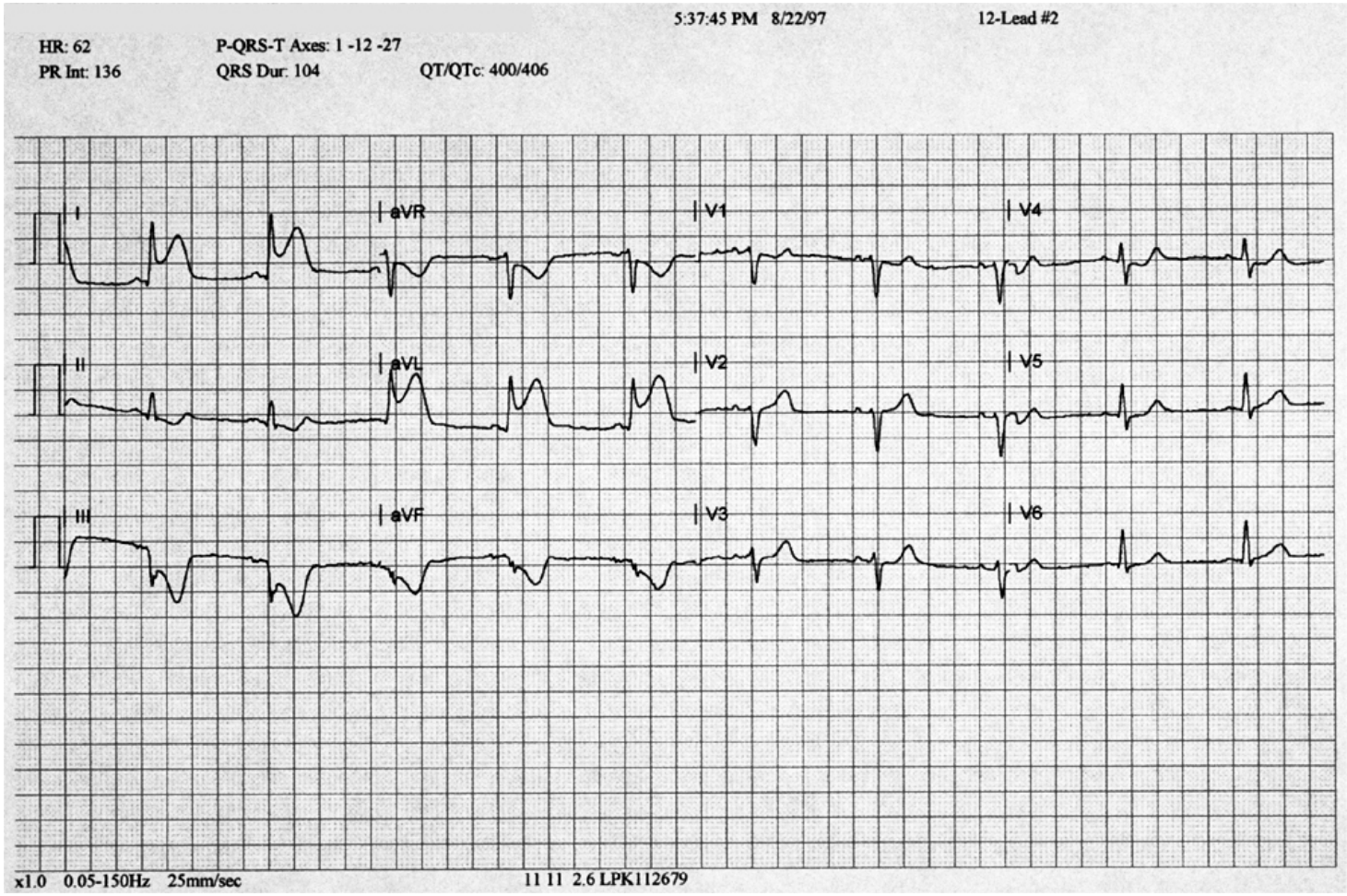
Localization Practice ECG



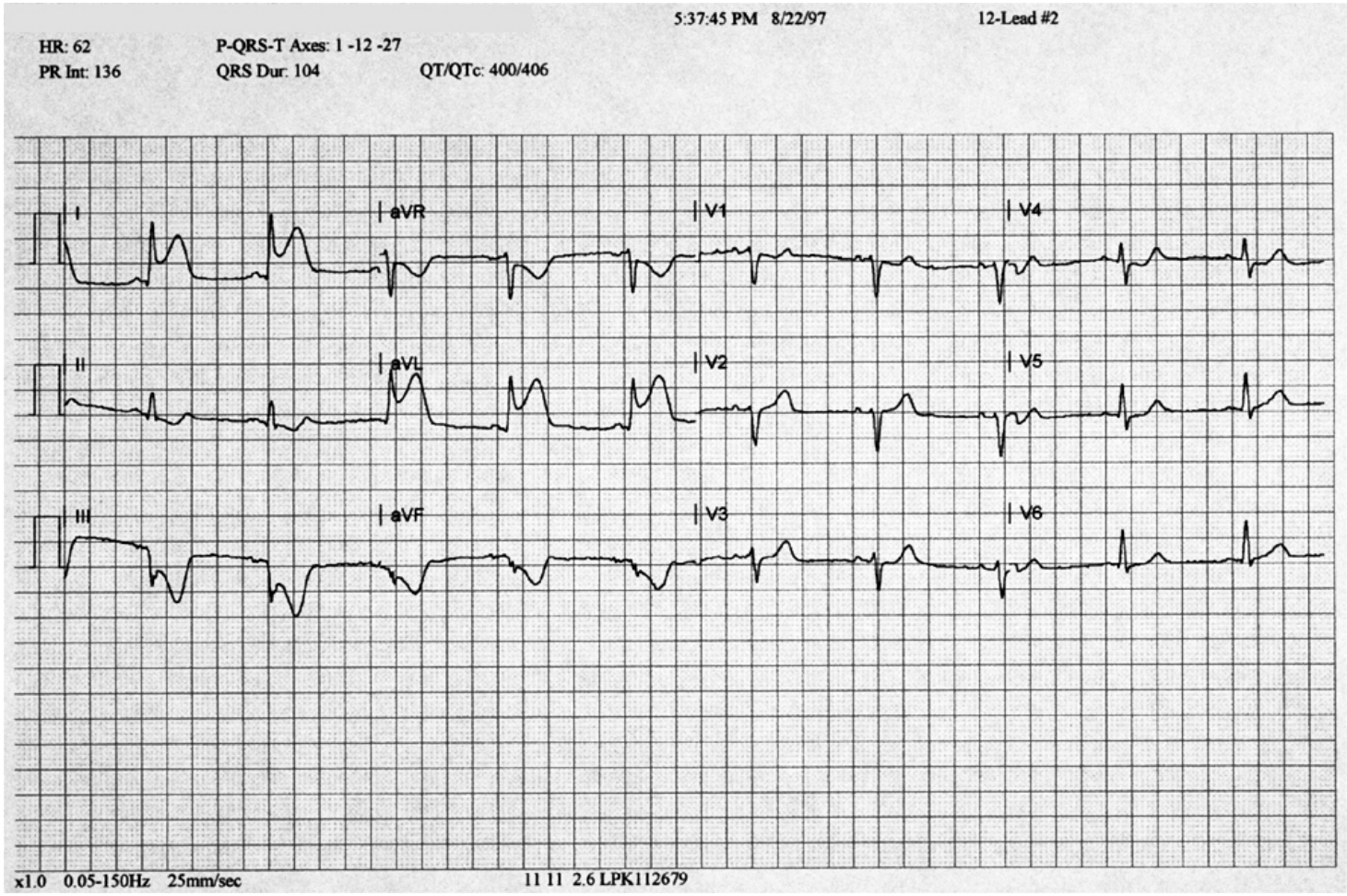
Localization Practice ECG: *Anterior/Septal Wall*



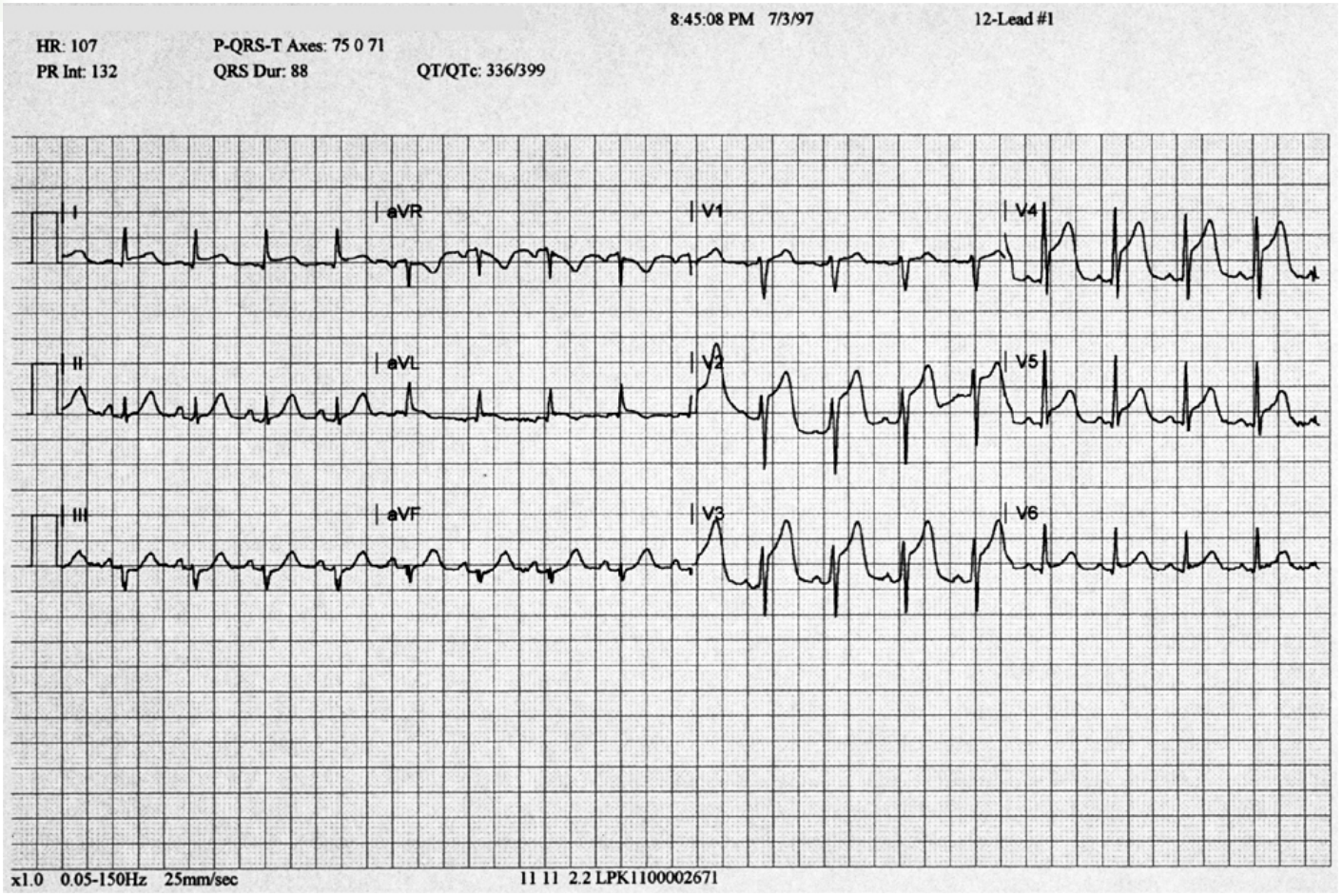
Localization Practice ECG



Localization Practice ECG: *Lateral Wall*



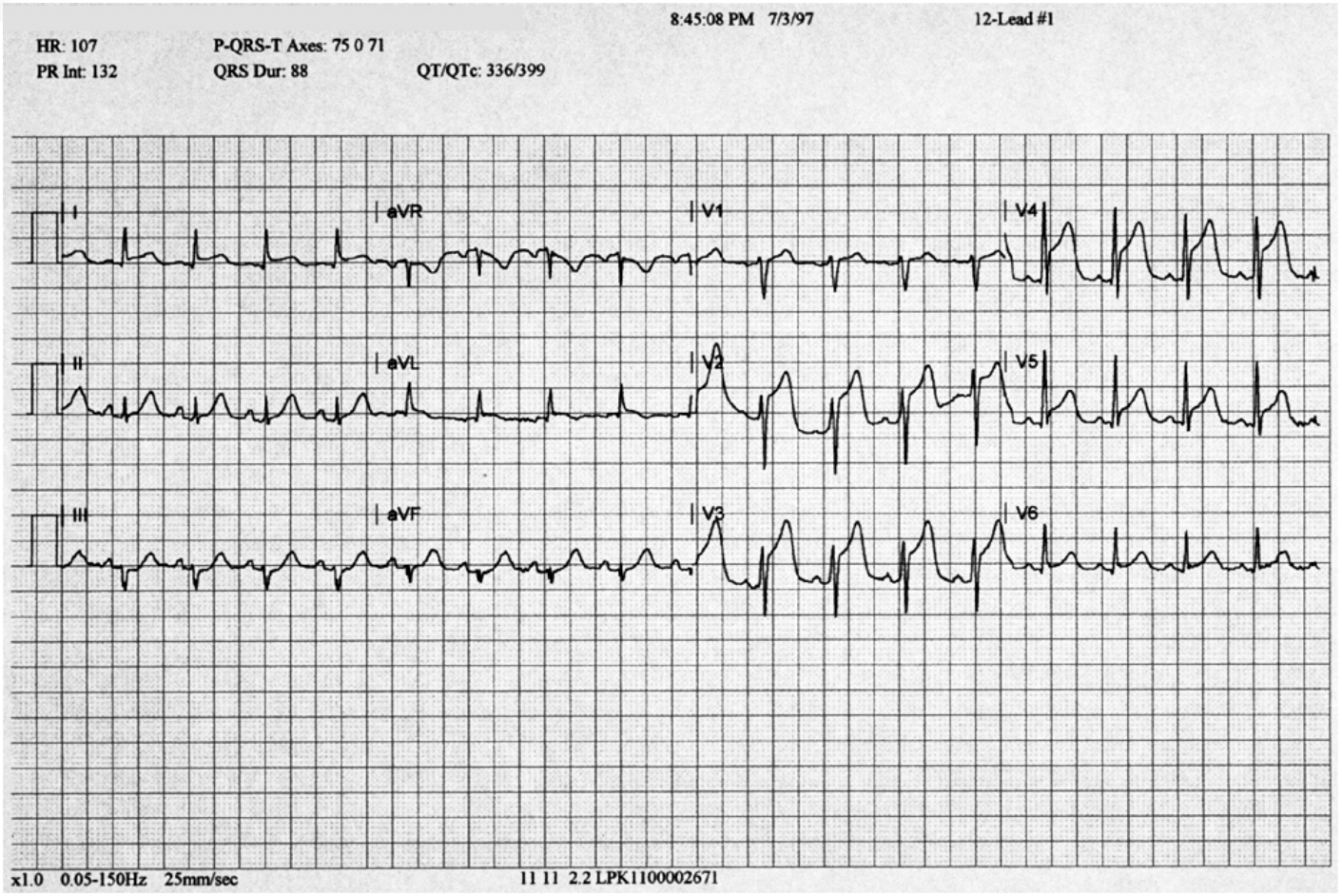
Localization Practice ECG



Localization Practice ECG:

Septal, Anterior and Lateral

commonly referred to as Extensive Anterior



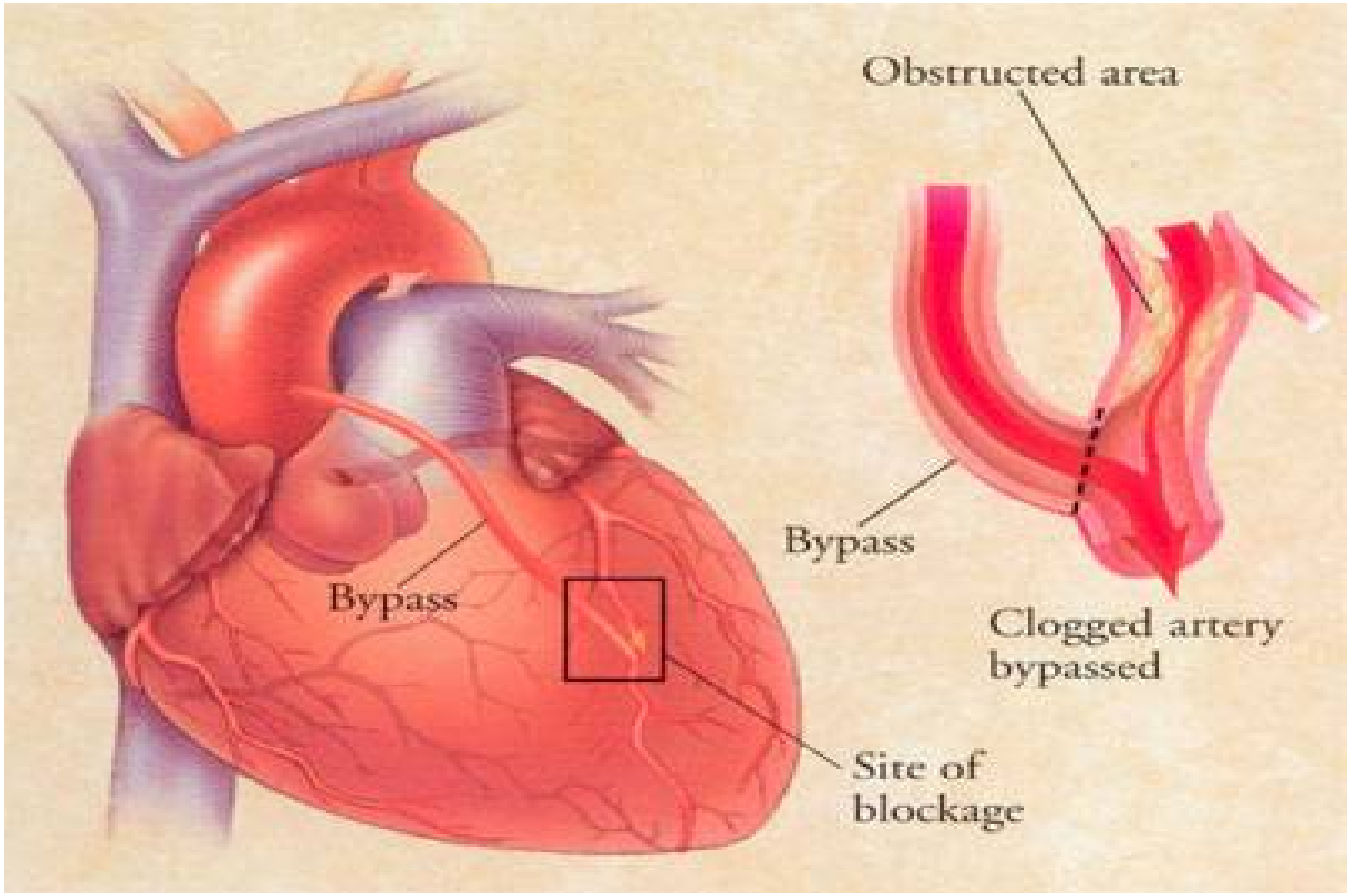
Localization: Extensive Anterior MI

- Evidence in septal, anterior, and lateral leads
- Often from proximal LCA lesion
- “Widow Maker”
- Complications common
  - Left ventricular failure
  - CHF / Pulmonary Edema
  - Cardiogenic Shock

Localization: Definitive Therapy for Extensive AWMI

- Normal blood pressure
  - Thrombolysis may be indicated
- Signs of shock
  - PTCA: Percutaneous transluminal coronary angioplasty
  - CABG: Coronary Artery Bypass Graft

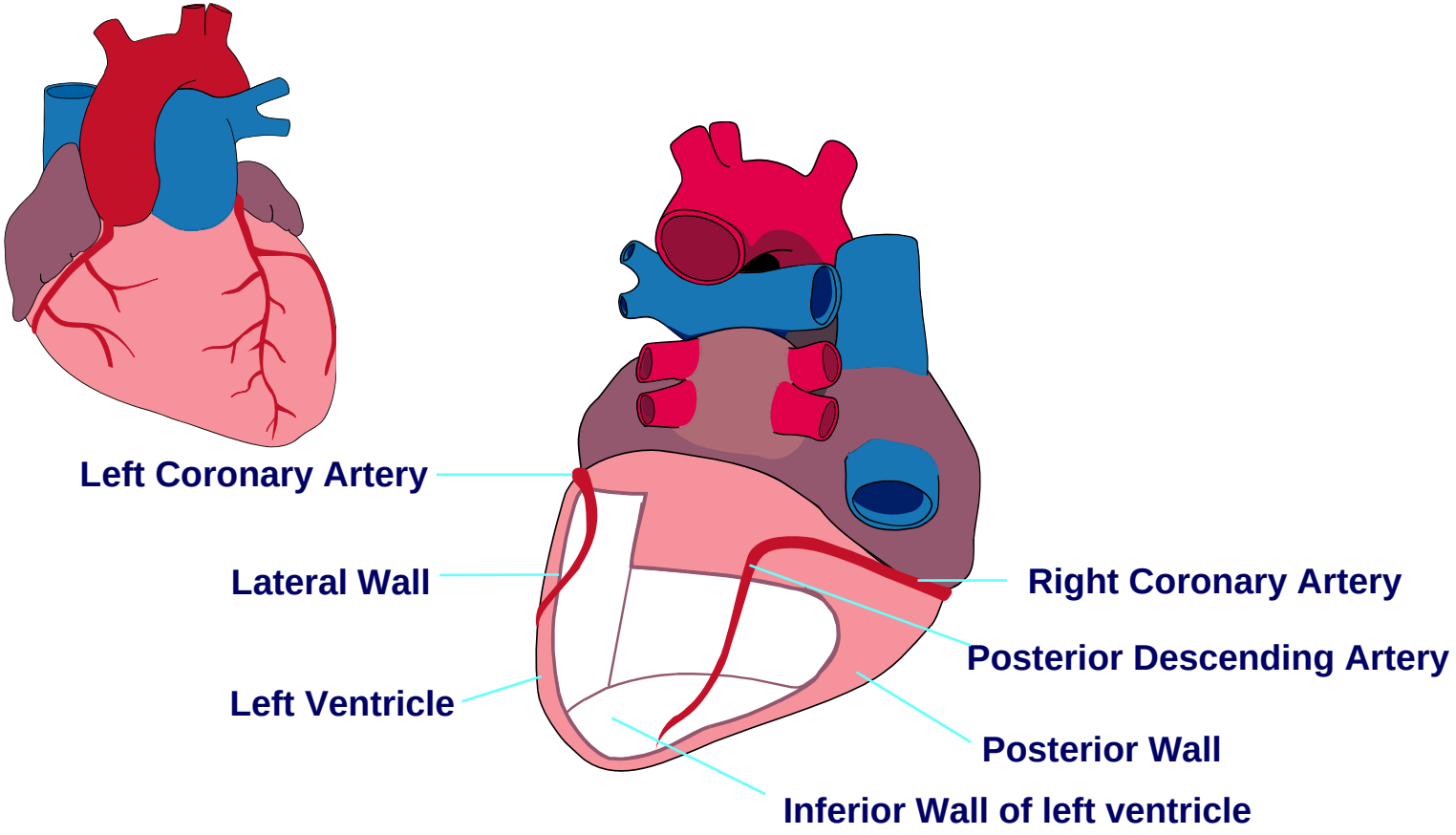
Coronary Artery Bypass Graft



Localization: LCA Occlusions

- Other considerations
  - Bundle branches supplied by LCA
  - Serious infranodal heart block may occur

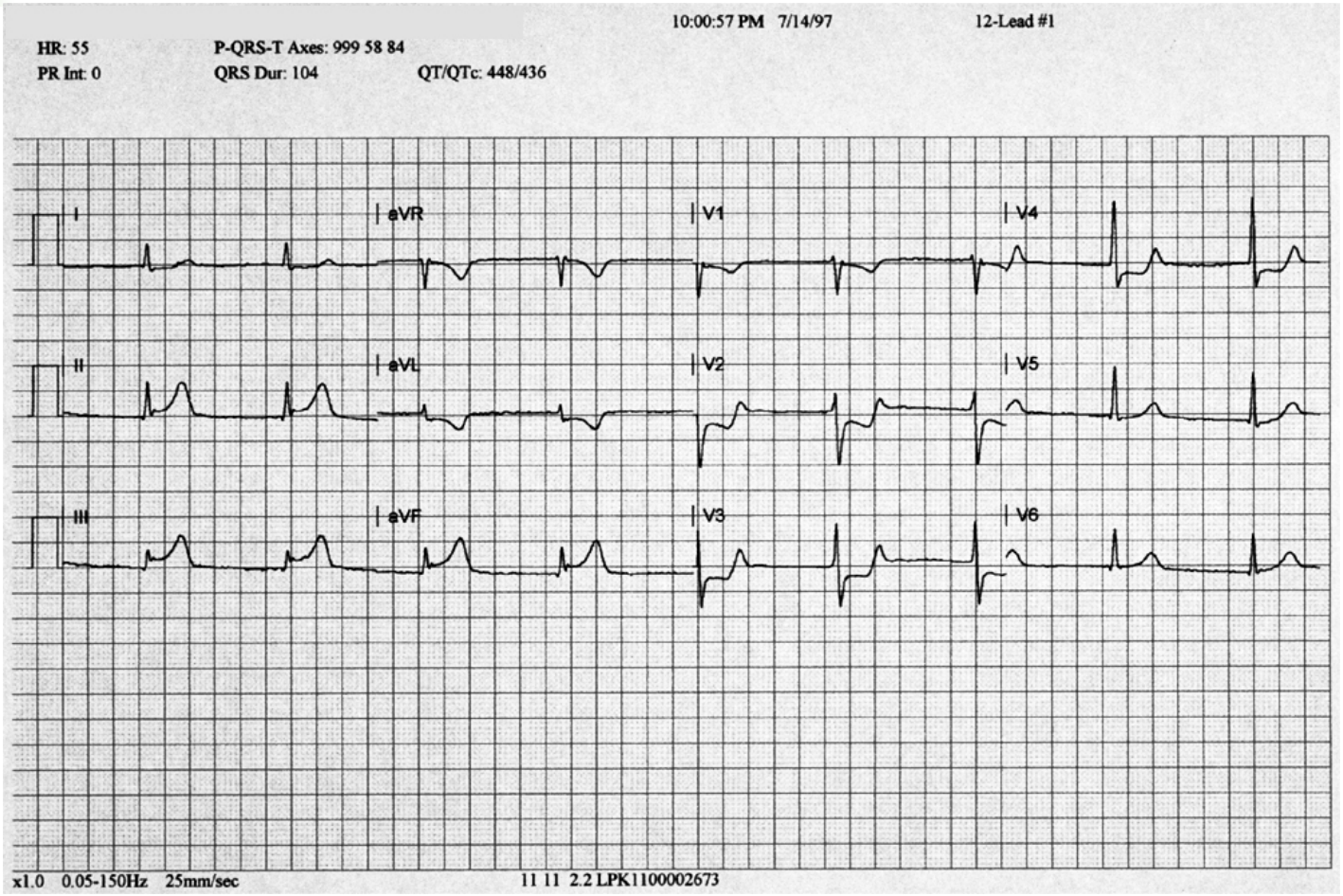
Localization:
Right Coronary Artery



Localization: Right Coronary Artery (RCA)

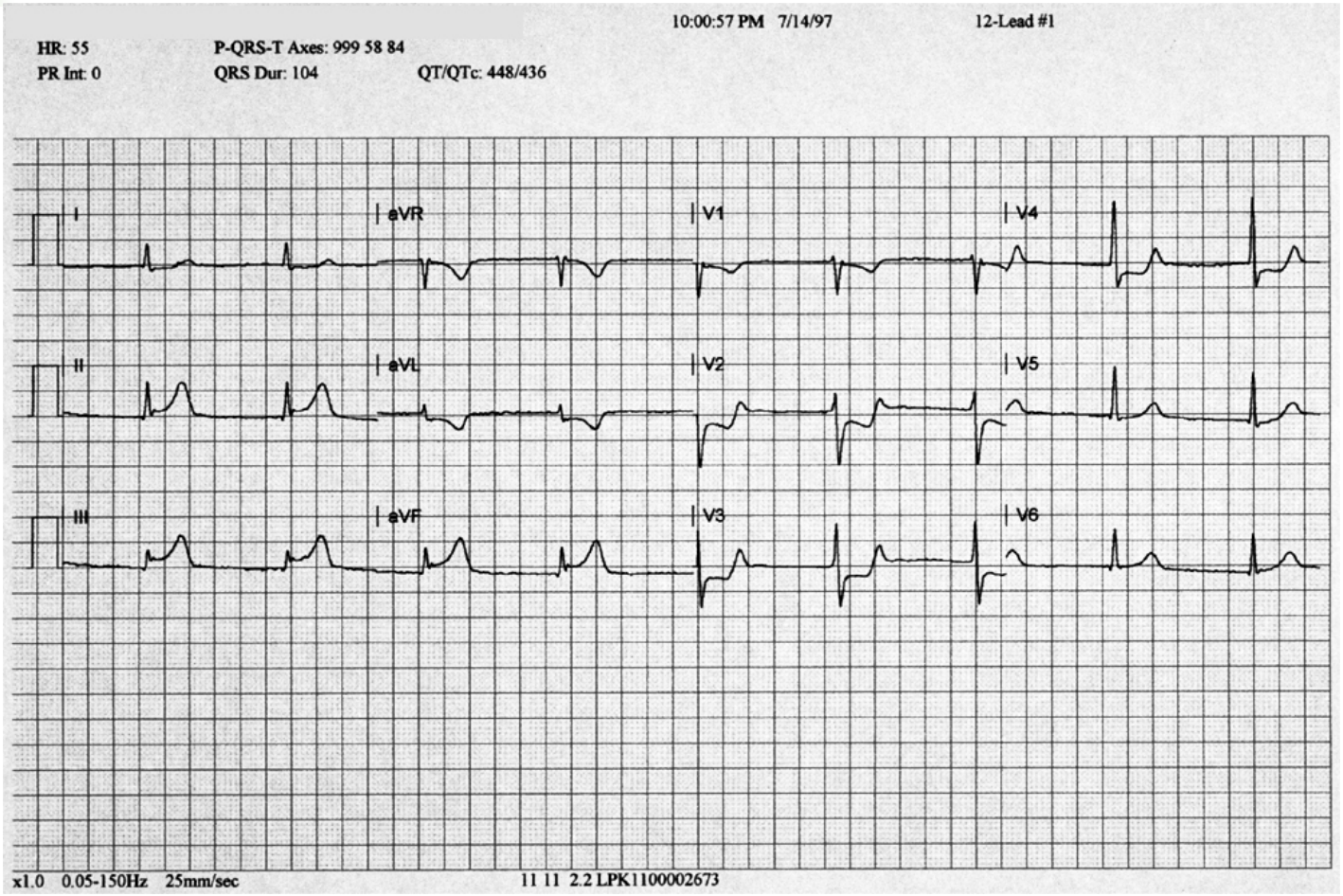
- Proximal RCA occlusion
  - Right Ventricle injured
  - Posterior wall of left ventricle injured
  - Inferior wall of left ventricle injured
- Posterior descending artery (PDA) occlusion
  - Inferior wall of right ventricle injured

Localization Practice ECG



Localization Practice ECG:

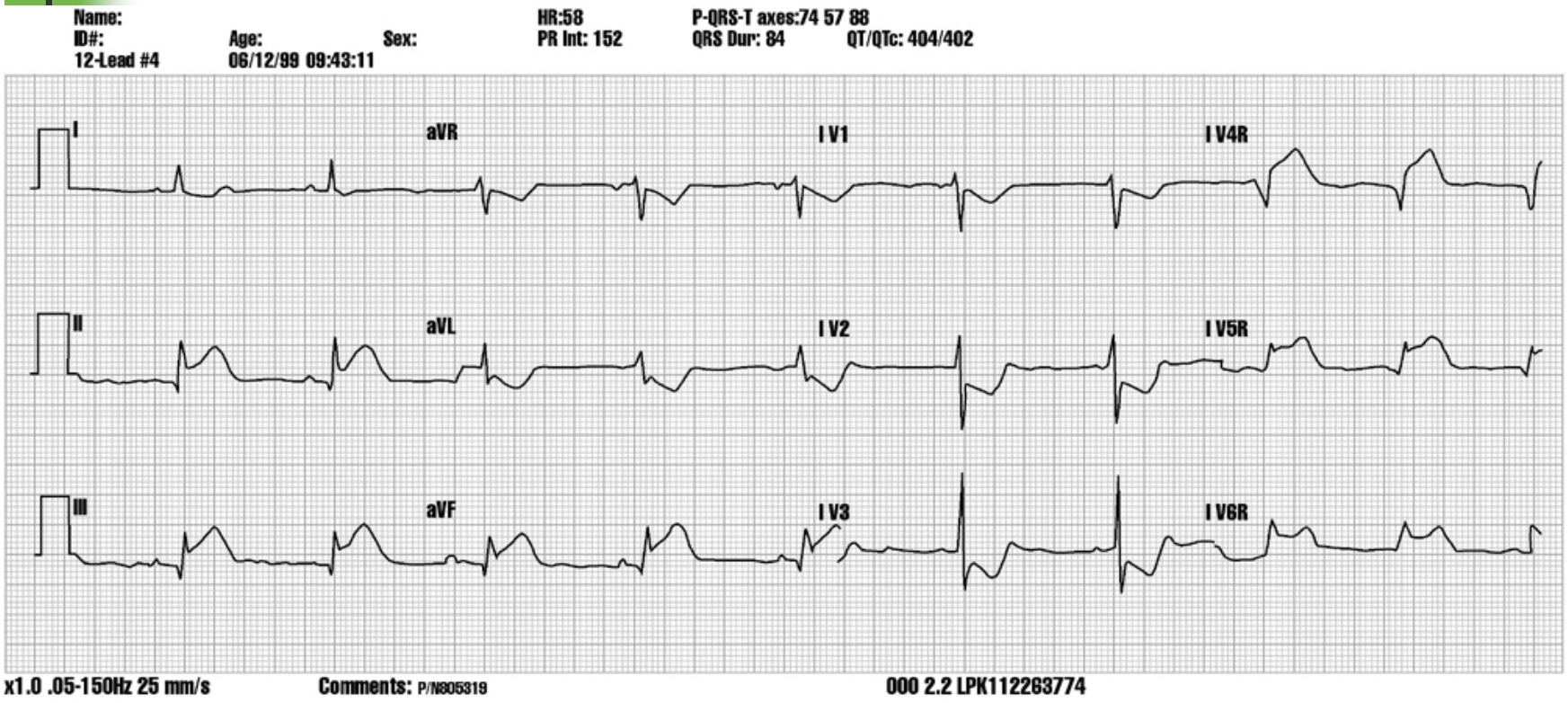
IWMI – RCA is occluded. Unknown if proximal or distal



Localization: Proximal RCA Occlusion

- Right Ventricular Infarct (RVI)
  - 12-lead ECG does not view right ventricle
  - Use additional leads
    - V3R - V6R
  - Right precordial leads
    - same anatomical landmarks as on left for V3 - V6 but placed on the right side

Localization Practice ECG

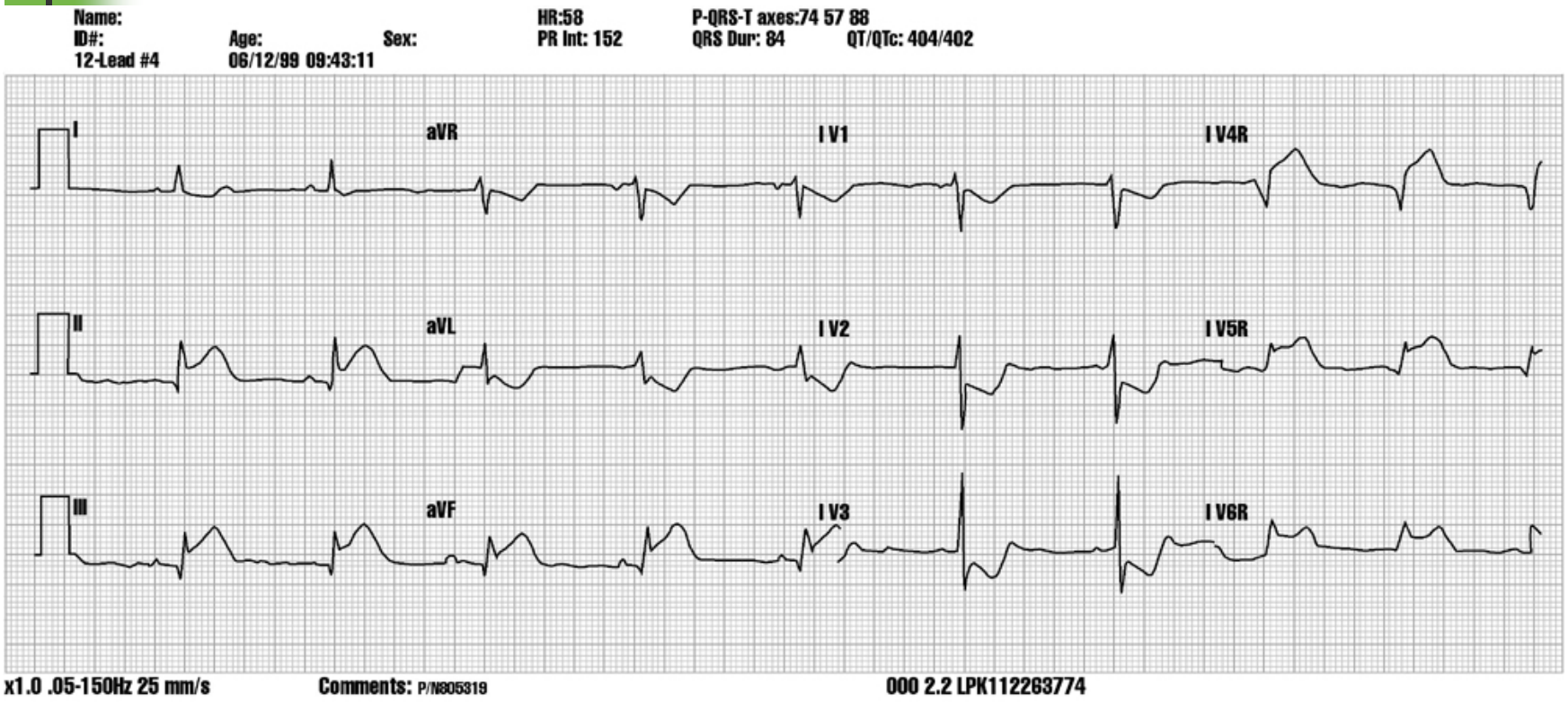


Note: “R” designation manually placed on this ECG for teaching purposes

Localization Practice ECG:

V4R, V5R and V6R show elevation

The proximal RCA must be occluded



Note: “R” designation manually placed on this ECG for teaching purposes

Localization: ECG Evidence of RVI

- Inferior MI (always suspect RVI)
- Look for ST elevation in right-sided V leads (V3-V6)

Localization: Physical Evidence of RVI

- Dyspnea with clear lungs
  - Due to failure of the right ventricle during an acute RVI
  - Dyspnea is caused by the decrease of pulmonary perfusion from the failing RV.

Localization: Physical Evidence of RVI

- Jugular vein distension
  - Backup of blood waiting to enter the failed RV
- Hypotension
  - Relative or absolute
  - (the left heart gets all its blood for ejection from the right heart, and the right heart has failed.)

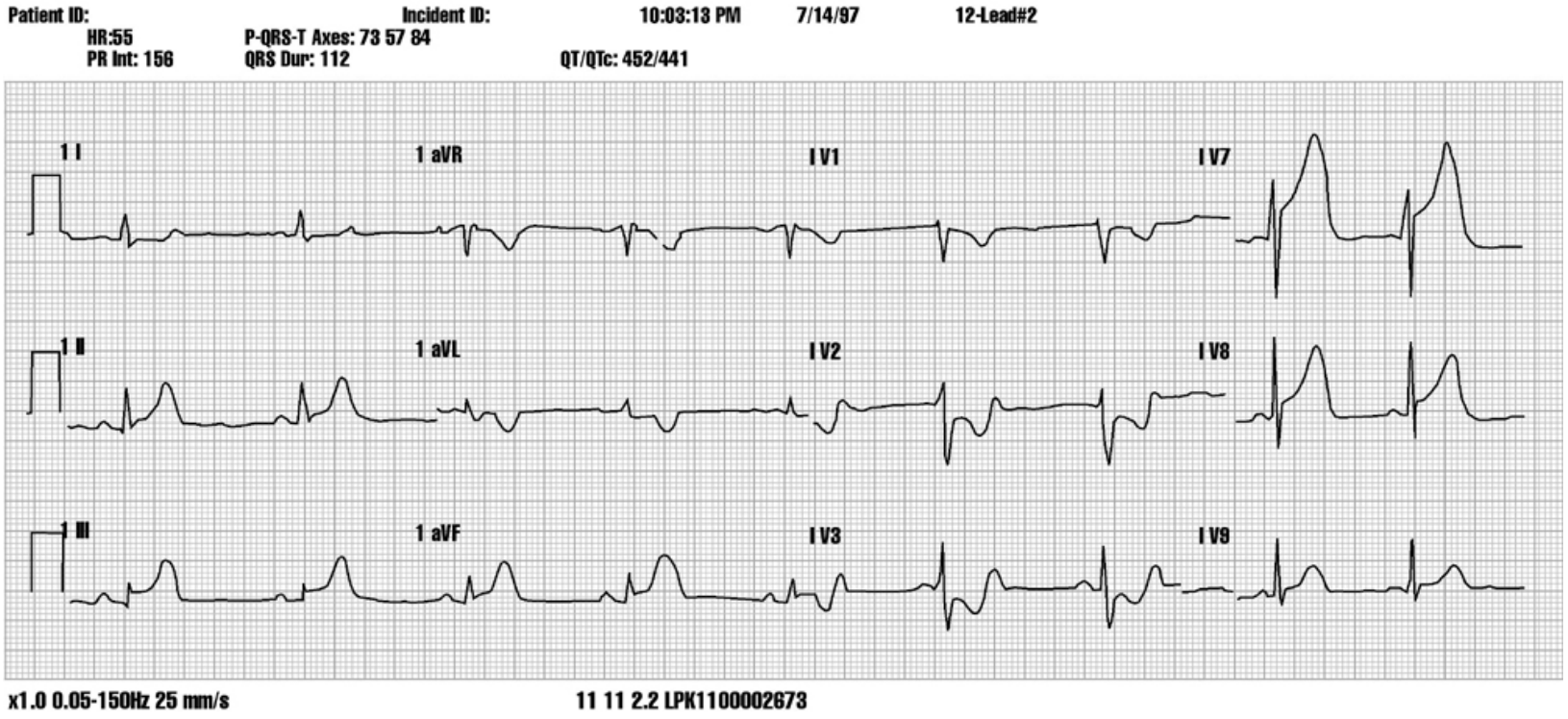
Localization: Treatment for RVI

- Use caution with vasodilators
  - Small incremental doses of MS
  - NTG by drip
- Treat hypotension with fluid
  - One to two liters may be required
  - Large bore IV lines

Localization: Posterior Wall MI (PWMI)

- Usually extension of an inferior or lateral MI
  - Posterior wall receives blood from RCA & LCA
- Common with proximal RCA occlusions
- Occurs with LCX occlusions
- Identified by reciprocal changes in V1-V4
  - May also use Posterior leads to identify
    - V7: posterior axillary line level with V6
    - V8: mid-scapular line level with V6
    - V9: left para-vertebral level with V6

Localization Practice ECG

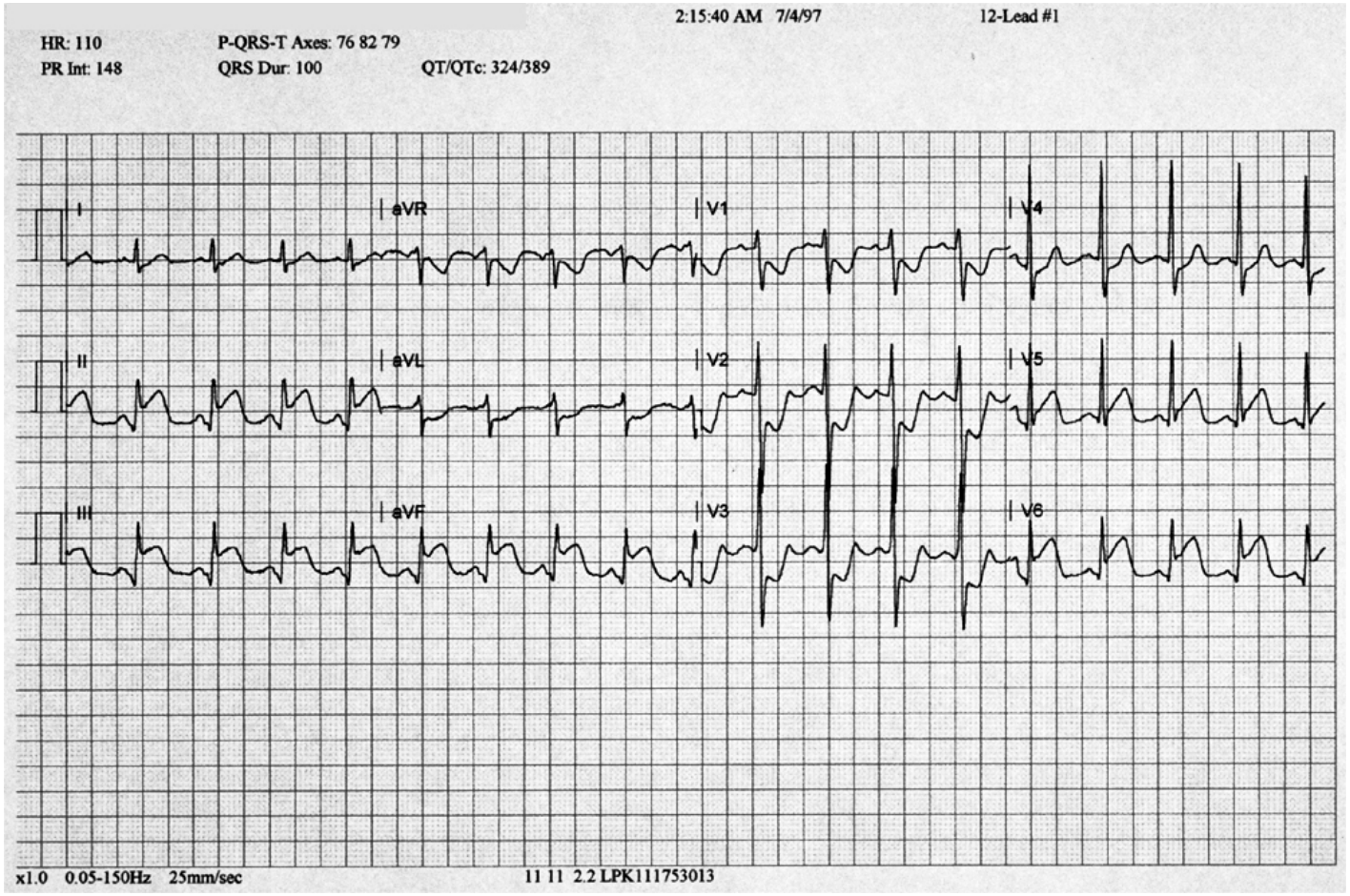


Localization: Left Coronary Dominance

- Approximately 10% of population
  - LCX connects to posterior descending artery and dominates inferior wall perfusion
- In these cases when LCX is occluded, lateral and inferior walls infarct
  - Inferolateral MI

Localization Practice ECG:

Infero-Lateral Wall MI



Localization Summary

- Left Coronary Artery
  - Septal
  - Anterior
  - Lateral
  - Possibly Inferior
- Right Coronary Artery
  - Inferior
  - Right Ventricular Infarct
  - Posterior

Evolution of AMI

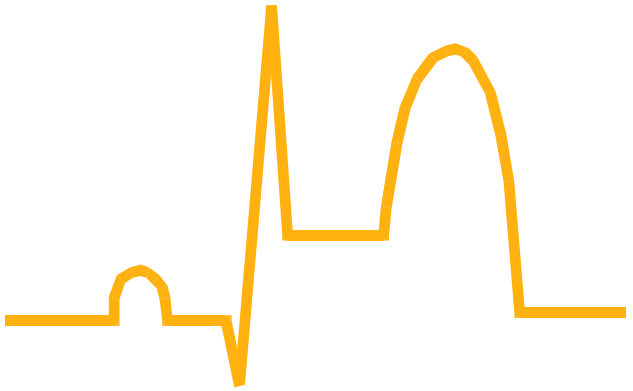
- **Hyperacute**
  - Early change *suggestive* of AMI
  - Tall & Peaked
  - May precede clinical symptoms
  - Only seen in leads looking at infarcting area
  - Not used as a diagnostic finding

Evolution of AMI

- **Acute**
  - ST segment elevation
  - Implies myocardial injury occurring
  - Elevated ST segment presumed acute rather than old

Evolution of AMI

- **Acute**
  - ST segment Elevated
  - Q wave at least 40 ms wide = pathologic
  - Q wave associated with some cellular necrosis



Evolution of AMI

- **Age Undetermined**
  - Wide (pathologic) Q wave
  - No ST segment elevation
  - Old or “age undetermined” MI

AMI Recognition

A normal 12-lead ECG *DOES NOT* mean the patient is not having acute ischemia, injury or infarction!!!

Please continue to part 3 of this presentation

Thanks!!