

“Doctor, my chest hurts”

Diagnosis and Treatment of ACS

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Objectives

- Define ACS
- Assess and triage patient presenting with chest pain/ ACS
- Demonstrate appropriate use of a Coronary Risk Calculator
- Determine appropriate initial management of a patient with suspected ACS

Case Study

66yo female with h/o HTN, DSL, COPD, and DM2 admitted for community acquired pneumonia and acute on chronic respiratory failure complaining of chest pain. Nurse reports onset chest pain 10 minutes ago. BP 130/80, HR 92. You order a stat EKG.

What is Acute Coronary Syndrome (ACS)?

The term ACS is applied to patients in whom there is a suspicion or confirmation of acute myocardial ischemia or infarction. The following conditions fall into this category:

- Unstable Angina - ischemic symptoms suggestive of ACS without elevation in troponin, with or without EKG changes indicative of ischemia
- NSTEMI – symptoms, with or without EKG changes, and an elevation in Troponin
- STEMI – presence of symptoms, AND elevated Troponin, AND ST elevation in contiguous leads or new onset LBBB on EKG

Fourth Universal Definition of MI

- Type 1: caused by acute atherothrombotic CAD and usually precipitated by plaque disruption
- Type 2: MI consequent to a mismatch between oxygen supply and demand (including coronary dissection, vasospasm, emboli, or conditions of increased demand)

- Type 3: typical presentation, but with unexpected death before the appearance of biomarkers in the blood
- Type 4: MI associated with PCI
- Type 5: MI associated with CABG

Symptoms of ACS

- Chest pain or discomfort, often described as pressure, fullness, or tightness
- Pain or discomfort in one or both arms, the jaw, neck, back, or stomach
- Shortness of breath
- Nausea
- Diaphoresis

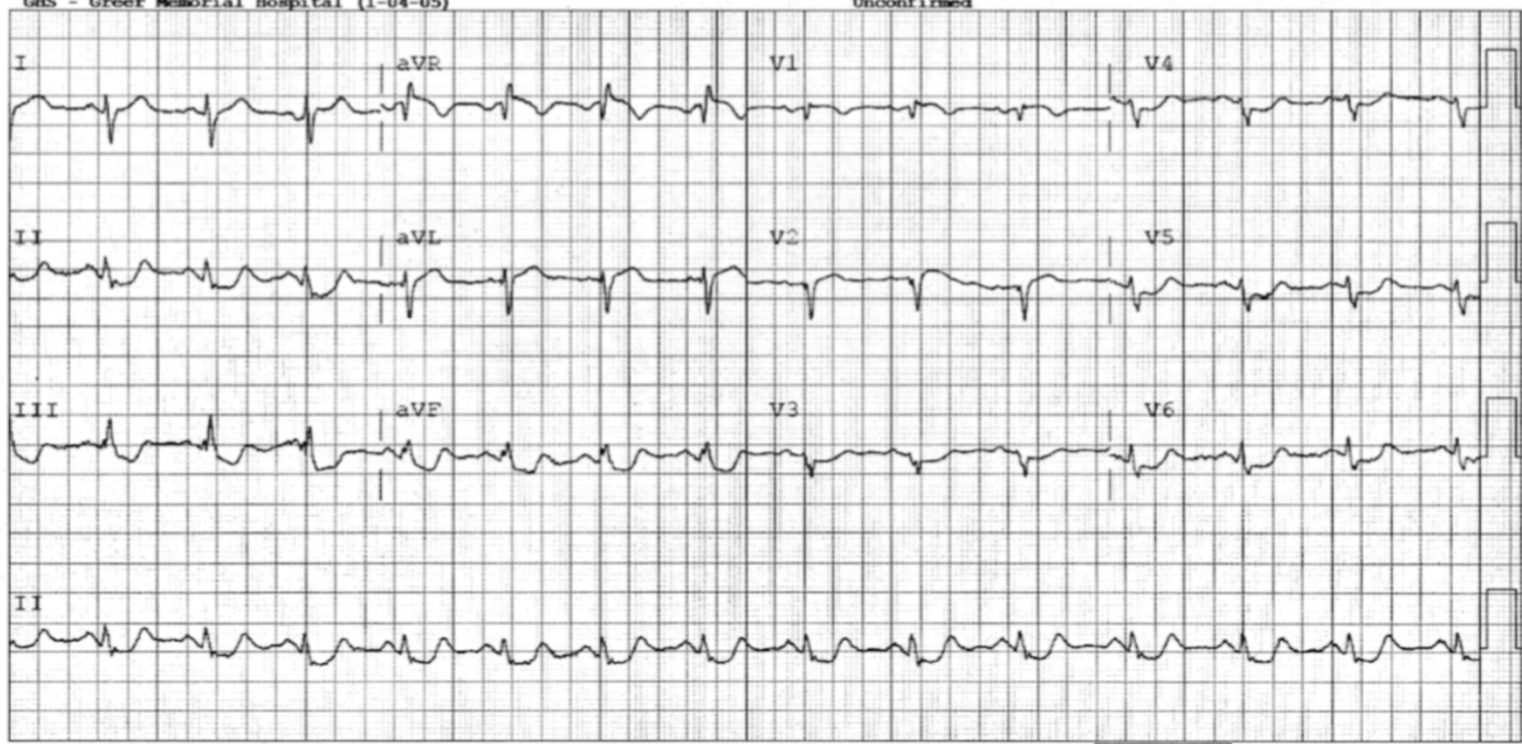
-- AXIS --
P 62
QRS 136
T -8

- ABNORMAL ECG -

Order #: 81430137EPC
Enc ID: 1000097692906
Reason: Chest Pain
Standard 12
Requested By: MILKO, JOHN

GHS - Greer Memorial Hospital (1-04-05)

Unconfirmed



Device: Speed: 25 mm/sec Limb: 10 mm/mV Chest: 10 mm/mV 0.05-150 Hz PH090A

An EKG has been obtained,
what next?

Cardiac Enzymes

- CK >2x normal or elevated CK-MB
- Troponin is more sensitive than CKMB
- Elevated troponin is highly specific for cardiac injury (compared to CK) but may be elevated due to A-fib, PE, recent DCCV, renal disease, etc.

Cardiac Risk Score

TIMI risk score – One point is given for each of the following:

- age > 65
- ASA within the last week
- at least 2 angina episodes in the last 24 hrs
- ST deviation on EKG
- known CAD
- at least 3 risk factors for CAD

Patients are considered to be at low risk with a score of 0-2, intermediate risk with a score of 3-4, and high risk with a score of 5 or greater

GRACE Score

- Predictor variables used are age, HR, SBP, serum Cr, Killip heart failure class, presence of cardiac arrest, deviation of ST segment, and cardiac enzyme levels.

Killip heart failure classification

- *Stage 1: No clinical signs of decompensation*
- *Stage 2: presence of rales, S3, JVD*
- *Stage 3: frank pulmonary edema*
- *Stage 4: hypotension or cardiogenic shock*

GRACE ACS Risk Model

Admission | Discharge

Years | Age

bpm | HR

mmHg | SBP

mg/dL | Creatinine

Killip Class | CHF

Yes No | Cardiac arrest at admission

Yes No | ST-segment deviation

Yes No | Elevated cardiac enzymes/markers

Probability of	Death	Death or MI
In-hospital	-	-
To 6 months	-	-

Risk | Score | US | SI

Calculator | Instructions | GRACE Info | References | Disclaimer

1:28 | LTE

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TIMI Risk: CV Events [NSTEMI]

≥65 y of age | No (0) | Yes (1)

≥3 risk factors for CAD | No (0) | Yes (1)

Prior coronary stenosis ≥50% | No (0) | Yes (1)

ST deviation on ECG | No (0) | Yes (1)

≥2 anginal events in prior 24 h | No (0) | Yes (1)

Use of aspirin in prior 7 d | No (0) | Yes (1)

Elevated cardiac biomarkers | No (0) | Yes (1)

TIMI Risk Score

All-Cause Mortality*, %

* All-Cause Mortality, New or Recurrent MI, or Severe Recurrent Ischemia Requiring Urgent Revascularization Through 14 d After Randomization, %

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HEART Score

Used by the ED. Takes into account the history (subjective) , EKG findings, Age, Risk factors, and initial troponin. Each category is assigned a score.

- Score of 0-3: 0.9 – 1.7% risk of MACE (major adverse cardiac event) in the next 6 weeks.
- Score of 4-6: 12 – 16.6% risk
- Score > 7: 50- 65% risk. These patients are candidates for early intervention.

If ACS is Definite or Likely

- Aspirin – 324mg **Immediate Release**
- P2Y12 (Effient or Brilinta)
- Anticoagulant (Heparin)
- Other measures: Morphine, Oxygen to keep $SO_2 > 90\%$, SL NTG

Timing of LHC: Early Intervention Strategy

< 2 hrs

- hemodynamic instability or cardiogenic shock
- recurrent or ongoing chest pain refractory to medical therapy
- life threatening arrhythmias or cardiac arrest
- acute heart failure with refractory angina or ST deviation
- dynamic ST or T-wave changes, particularly ST elevation (goal = 90 minute door to balloon)

< 24 hrs

- rise of cardiac enzymes
- ST or T wave changes
- Elevated heart score (GRACE score > 140)

< 72 hrs recommended in pts with at least one of these intermediate risk criteria:

- DM
- Renal insufficiency
- New LVEF < 40% or CHF (see note below)
- Early post-infarction angina
- Recent PCI
- Prior CABG
- GRACE score > 109 and < 140

Early invasive strategy is NOT recommended in patients with:

- extensive comorbidities in which the risk outweighs the benefit of revascularization
- acute chest pain and **low likelihood** of ACS with negative troponins

Antiplatelet / Anticoagulant Considerations

How long to continue DAPT???

- BMS : at least one month
- DES (depends on the type/ generation of stent placed): rule of thumb is at least 12 months
- CABG : 12 months (in presence of ACS)
- medical management of NSTEMI: at least 12 months
- s/p lytics: minimum of 14 days and ideally at least one year

Best Practice Guidelines for Long-Term Management of ACS

- Aspirin
- Beta-blocker
- RAS blocker (ACEi or ARB)
- Statin
- Heartlife referral

Review of Case Study

66yo female with h/o HTN, DSL, COPD, and DM2 admitted for community acquired pneumonia and acute on chronic respiratory failure complaining of chest pain. Nurse reports onset chest pain 10 minutes ago. BP 130/80, HR 92. You order a stat EKG.

- EKG: NSR with lateral ST depression*
- Troponins: 0.04, 1.64, 4.56*

- ASA 324mg and 81mg daily
- Ticagrelor 180mg once and 90mg BID
- Heparin 5000u bolus and gtt
- PRN Morphine, oxygen, and NTG
- Early intervention strategy is recommended < 24hrs
- BB, ACEi, and statin

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