I. Background
AMIIs inappropriately sent home
• Younger
• Less typical symptoms
• Less likely to have a history of prior CAD
• Less likely to have obvious ECG evidence of ischemia or infarction
• Mortality 25-35% (mortality 10-12% when admitted)
 Common pitfalls
• Failure to recognize atypical presentations
• Failure to consider cardiac risk factors and high-risk groups
• Over-reliance on “negative” tests — as the number of tests performed increase, so
does the number of false negatives

II. Atypical Presentations
What the literature says about the AMI patient:
• Onset
  • Sudden onset in up to 70%
• Location
  • Upper abdominal pain in up to 20%
  • Other common sites — left arm, anterior neck/jaw, upper back
• Duration
  • Few minutes to few hours
  • Momentary — unlikely
  • Constant for days — unlikely
    • Beware intermittent pain (UA)
• Character
  • Crushing/pressure — 24% AMI, 30% UA
  • Mild ache — 13% AMI, 15% UA
  • Sharp stabbing — 20% AMI, 17% UA
  • Burning/indigestion — 20% AMI, 21% UA
• Alleviating factors
  • Some relief with antacids — 15%
• Aggravating factors
  • Pleuritic or positional — 16%
• Reproducible with palpation
• Activity at onset
  • Heavy physical activity — 6%
  • Mild-to-moderate physical activity — 29%
  • Emotional stress — 7%
  • Eating — 8%
• Associated symptoms
  • Nausea — 60%
  • Vomiting — 39%
  • Dyspnea — 60%
  • Diaphoresis — 80%
    • May be the most specific symptom as well
  • Belching — 47%
• Radiation
  • Occurs in 67%
  • Left arm — 55% sensitivity, 76% specificity
  • Right arm — 41% sensitivity, 94% specificity

Painless AMIs
• 18-33% overall
• Dyspnea — the most common anginal equivalent

III. Cardiac Risk Factors

Gender
• Men are at greater risk of AMI
• Women are at greater risk of misdiagnosis
• 20% have no chest pain
  • Often present with epigastric pain, nausea/vomiting, dyspnea, diaphoresis
  • Present with neck or back pain more frequently than men
• Pain radiates to right side more frequently than men
• ECG issues
  • Women (especially young women) with chest pain are less likely to get an ECG
  • ECG abnormalities tend to be more subtle than in men
• Women are more likely to have false-negative stress tests

Age
• Young patients
  • 123,000 AMIs per year in patients 29-44yo.
  • Autopsy studies from Korean/Vietnam wars demonstrated CAD in young patients
    • Autopsy study of 111 patients (< 35yo., avg. age 26yo.)
    • Evidence of atherosclerosis in 78%
• Elderly patients
  • Painless AMI in the elderly
• 40% of patients > 65yo.
• 60-70% of patients > 85yo.
• Anginal equivalents in elderly patients
  • 30-40% present with dyspnea
  • 5-20% present with confusion/lethargy
  • 5-10% present with emesis/diaphoresis
  • 5-9% present with acute CVA
  • 3-8% present with acute weakness
  • 3-5% present with syncope

Diabetes
• Atypical presentations (dyspnea, confusion, emesis, fatigue) in 40%
• Fazel, et al (Heart, 2005)
  • DM = CAD is now considered standard of care (“atherosclerotic disease equivalent”)

Cocaine use — another independent risk factor
• Acute use associated with:
  • Coronary vasospasm/vasoconstriction
  • Platelet aggregation
  • Adrenergic stimulation causing dysrhythmias and ischemia
• Chronic use associated with:
  • Direct myocyte toxicity leading to cardiomyopathy
  • Accelerated atherosclerosis
  • Seven-fold increase in risk of AMI (Qureshi, Circulation, 2001)

Lupus — a significant but underappreciated risk factor
• Multiple studies in the literature documenting accelerated atherosclerosis
• Nine-fold increase in risk of CAD in young patients (D’Agate, J Invasive Cardiol, 2003)
  • Fifty-fold increase in risk of CAD in women 35-44 yo. (Manzi, Am J Epidemiol, 1997)

Human immunodeficiency virus infection — another independent risk factor
• ACS develops more than 10 years earlier than in non-HIV controls
• Higher re-stenosis rates occur after PCI
  • Protease inhibitors are associated with adverse metabolic effects
    • Insulin resistance
    • Elevations in triglyceride levels
    • Elevations in LDL levels

Chronic renal disease — yet another independent risk factor
• Increased risk of ACS due to
  • Concomitant conventional risk factors
• Chronic renal disease-induced risk factors
  • Metabolic factors
  • Other atherogenesis factors

IV. Provocative and Invasive Testing
How reliable is a recent “negative” stress test or angiogram? (“negative” or “normal” is not always normal)
• Good sensitivity for detecting “significant” (> 70% lumenal obstruction) lesions
  • Stress testing approximately 85-90% sensitive (not perfect!)
• Plaque composition is more important than plaque size
  • Smaller plaques may be more “unstable,” prone to rupture
  • Angiography studies indicate that the infarct-related artery (IRA) is usually not critically stenosed
    • IRA usually is < 50% obstructed before it ruptures!
    • Severely limits the reliability of a recent “negative” stress test or angiogram
• Other causes for false negative angiograms
  • Intravascular ultrasound studies
    • Coronary artery remodeling produces “outward bulging” of the vessel walls
      • Significant plaques can be present despite an apparently “patent” lumen on angiography
    • Angiography often fails to detect evidence of recent plaque rupture

V. Summary
• Always recognize the possibility of an atypical presentation.
  • Chest pain is not always present.
  • Beware the “GI presentation.”
  • Diaphoresis is bad!
• Pay attention to cardiac risk factors.
  • Don’t discount the risk in young patients.
  • Women, elderly and diabetics present atypically.
  • Cocaine use, lupus, HIV, and chronic renal disease deserve special concern.
• Don’t discount the risk just because of a recent “negative” stress test or angiogram.
• Documentation is key!
• Remember Rules 1 and 2
  • Never say “It’s not your heart!” (you will sometimes be wrong)
  • Do what’s best for the patient (not what’s best for your consultant)
  • Don’t forget about deadly non-ACS causes of chest pain!

VI. Recommended reading if you enjoy learning from “pitfalls”