Differential Diagnosis of Chest Pain
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WHO is your patient?
Context matters!
Age, gender, diagnoses past and present, medication, new information (travel, med changes by other providers)

Both with chest pain
Who goes to the ER?

Chest Pain
• Cardiac output (pump and volume dependent)
• Perfusion/Ventilation/oxygenation
  – Hypoxia
  – Anemia
  – Anaphylaxis, sepsis, vascular collapse
  – Thyroid/endocrine/metabolic
  – Arrhythmia, brady or tachycardia
  – Valvular or structural heart
  – Primary or secondary pulmonary disease
  – Mechanical, overuse muscle, cartilage, bone
  – Nerve irritation
Case Study 1

68-year-old male who presents to his internist's office for routine follow-up. He has a history of hypertension and dyslipidemia that has been controlled for the past 2 years with hydrochlorothiazide, enalapril, and lovastatin. He has also been on aspirin therapy. BG smoked for 15 years but successfully quit 10 years ago.

In the 2 weeks prior, he had noticed some chest tightening when working out, but had attributed the pain to being out of shape because his symptoms subsided when he stopped exercising. On the morning of presentation to the emergency department, he awoke with sustained chest discomfort and described his symptoms as accelerating. The symptomatic episode was accompanied by mild shortness of breath, diaphoresis, and nausea that lasted for 15 minutes.

Case Study 1

- discussion

Minimal Elements of a C-V History

- PMH: Hx of RHD, MI, CVA, CAD, angina, vascular disease, DM, HTN, dyslipidemia, valve or rhythm disorders, C/V surgery, PM, CHF, pulmonary and thyroid dz, connective tissue disorders (SLE, sarcoid, amyloidosis), hereditary abn, DVT/PE, conditions/meds that impact C-V system, lipids or glucose, past evaluations and diagnostics
- Symptoms (now or ever) CP, SOB, cough, wheeze, Dizzy, Syncope, claudication, change in activity tolerance, weight gain or loss, orthopnea, edema
Minimal Elements of a C-V History

- Family: MI, CVA, CM, HTN, DM, connective tissue disorders, cardiac death <55, sudden death, ages and causes at death, hypercoaguable states
- Social: Smoking (present and hx), exercise, diet, ETOH, drugs, cocaine, OTC decongestants, herbals, anabolic steroids, ephedra, weight loss agents, caffeine
- Genetic, racial, ethnic, and lifestyle predispositions to pathology

CAD, Acute Coronary Syndrome, and MI

Symptom Description
Think Acute Coronary Syndrome/MI

- Quality-burning, aching, indigestion, pressure, stabbing, Radiation?
- Location-typical=midsternal, jaw, +/or left arm. Often-midscapular, epigastric
- Timing-intermittent, when became continuous or severe, activity vs.. Rest relief, exac. and relieving factors-food, rest, level of activity
“Atypical” Presentations
Common in ACS

Women are typically atypical! Often seen for malaise, fatigue, shoulder, upper back, or RUQ pain

• 2 most frequent prodromal symptoms (severe in intensity)
  – fatigue
  – sleep disturbances
• Next 3 most frequent symptoms were just as likely to be rated as severe, medium, or mild
  – shortness of breath
  – indigestion
  – anxiety

Sirkin, Amy J

Shortness of Breath

Sirkin, Amy J

Case Study 2

• 21 yo healthy female smokes ½ ppd for 5 years
• Awoke last night with mild shortness of breath. Today still feels like she is “working harder to breathe” and had to stop several times while walking to her class at the college building down the street.
• Your history reveals no CP, URI symptoms, trauma, prolonged immobility, or travel. She recently started OCs and her menses are more regular and less painful now.
• Her physical exam, vitals, and O2sats are completely normal but she looks like she is working hard to breathe.

What are the red flags? What else will you ask?
Case Study 2

- discussion

Pulmonary Embolus

- At least 100,000 cases of PE occur each year in the US
- 3rd most common cause of death in hospitalized patients.
- If left untreated, about 30 percent of patients who have PE will die.
- PE occurs equally in men and women.
- Risk for PE doubles every 10 years after age 60.
- Most of those who die do so within the first few hours of the event
- In 9 out of 10 cases, pulmonary embolism (PE) begins as a blood clot in the deep veins of the leg
- Other causes: fat, air or tumor embolism

Possible s/s: CP, SOB, arrhythmia, hemoptysis, calf pain, calf edema, asymptomatic
Diagnostic w/u
- Venous doppler LEs
- CT angiogram
- VQ scan
- Utility of D-dimer
- CXR not too helpful
- Other: chest MRI, echo
Management, duration of anticoagulation, lytics
Case Study 3
72 y o male with history of controlled HTN, CAD s/p stent, afib on plavix, asa, furosemide 20 mg, K+ 20 meq, lisinopril, coumadin , carvedilol.
• Last visit 1 month ago: BP 134/76, HR 74, RR18, sat 95%, weight 184, trace pedal edema which improves in am, normal BMP and CBC. INR is therapeutic.
• “a little more SOB” doing less. “cough is worse at night”
• On exam: No change in edema, afebrile, weight 186, BP 166/90 HR 75, RR 18, resting sat 95%, no JVD or HJR. You notice shoulder movement with respiration. S3 and bilateral crackles 1/3 up bases.
Overt Congestive Heart Failure

You can have left sided heart failure and pulmonary congestion without signs of overt right-sided heart failure.

CHF may present with SOB, DOE, palpitations or chest pain depending on the extent of ischemia and concurrent pathology.

Heart failure

- Underlying causes
  - CAD, HTN, Non-ischemic CM, DM, valvular, congenital heart disease, OSA, thyroid,
  - CTX, cocaine, alcohol, HIV
- Heart function weakens over time
- History and exam features
- Diagnostic aids
  - CXR, BMP
  - ECHO w/doppler, Stress, PET, cardiac MRI, TFTs

Case Study 4

- 18 yo male presents for a physical exam. He feels fine, his vitals are normal, has no significant past medical or family history.
- On seated exam you find a harsh systolic murmur over the left sternal border
- What else do you need to know in the history?
- Family Hx?
- What else do you do in the exam?
- What diagnostics are needed most urgently?
Case Study 4

- discussion

Cardiomyopathy

- Ischemic or non-ischemic (hypertrophic, restrictive)
  - Post viral
  - Ischemic
  - Alcohol induced
  - Pregnancy
- Primary or secondary

Echocardiogram

Evaluates
- Structure
- Wall Motion
- Chamber Size
- LV Function

Usually done with doppler studies to evaluate flow through the valves

Source: http://medlineplus.gov/
Case Study 5

• A 28 year old male with no PMH always feels fine. He plays tennis regularly, bikes almost daily. Says he is a “health nut who doesn’t smoke, drink ETOH, take any herbals steroids or medications and eats a balanced vegan diet.
• He looks and feels well today.
• On questioning he “almost passed out” 1 mile into a light hike yesterday which he attributed to the heat. Today he “had dizziness while watching TV”, some mild chest tightening, then awoke to find himself on the floor.
• Your nurse tells you his heart rate is 35 with a BP of 118/70. You take off his shirt and do an EKG.

Case Study 6

• Well thin 24 yo with no PMH presents with a 2 hour history of sudden onset left sided chest pain and mild shortness of breath. No drugs, tobacco, injury or recent illness.
• Vitals T 97.7  BP 152/80 HR 102 RR 24 sat=93%.
• Exam is unremarkable. EKG RST, otherwise normal.
• What is the most likely Dx with this age group and presentation?
Case Study 6

- discussion

Case Study 7

- A 56 yo male with a recent hospitalization for Achilles tendon repair, controlled HTN, non-smoker presents with 2 days URI symptoms now febrile with productive cough
- On exam he has a few clearing rhonchi, no wheezes, normal chest AP ratio and expansion, no bronchophony, normal tactile fremitis, crackles and localized egophony in the left lower lobe, a questionable fleeting rub. Heart tones are normal, no JVD, no crepitus, no chest wall tenderness
- Diagnosis? Most striking features assisting the differential? 

Case Study 7

- discussion
Case Study 8

- A16 yo female with no pmh complains of on and off sternal chest pain worsening over the last few weeks. No injury, no radiation, no associated symptoms.
- She points to the left sternal border.
- Her exam is normal but she winces when you gently press on the sternal rib border.
- Diagnosis?

Case Study 8

- discussion

Case Study 9

- 62 yo healthy male had a mild URI last week which was getting better. He has a mild cough that is getting better each day. Last night he could not lie supine as he had sub- sternal chest pressure and a sensation of not getting enough air. He is sitting on the exam table leaning forward with his elbows on his knees.
- On exam: no JVD, lungs clear. Heart: S1 S2 no murmurs, +rub, no wheeze or adventitious sounds.
- Diagnosis?
- Possible etiology?
Case Study 9
• discussion

Case Study 10
• A 68 yo male with a hx of CAD, controlled HTN, PVD Except for a little hoarseness he has been well.
• Today he presents with midscapular pain that is sudden, severe, and unrelenting for the last hour.
• His physical exam is normal but he looks very uncomfortable.
• What potentially life threatening event requires you to send him to the hospital and triage him immediately as urgent?

Case Study 10
• discussion
Case Study 11

• A 75 year old female with a hx of well controlled DM2 presents with severe left sided chest pain, started yesterday but today is worsening and relentless. It hurts to take a deep breath. It hurts to move. She has no dizziness, palpitations.
• On exam her breathing is shallow at 24/minute. She is anxious, alert, oriented. Breath sounds and heart sounds are normal. Her glucose is 125. Her EKG is normal.
• Think outside the box????

Case Study 11

• discussion

Thank You!

Please complete evaluations before you leave
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References

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- www.medscape.com/internalmedicine
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