Case 3
Pt is a 54 year old man who originally presented 5 days ago with complaints of "chest pain" that started 8 hours before he arrived at the hospital while the patient was walking to his car after dinner. The patient experienced similar pain less intensely over the last few years, but is stopped after a few minutes if the patient would discontinue physical activity. This pain was beneath his sternum, is 9/10, feels like a crushing sensation, and radiates to his left jaw. The patient had nausea, shortness of breath (SOB), diaphoresis, and dizziness. The pain does not improve when the patient stopped walking. Patient denies any new physical activity, acid reflux symptoms, positional chest pain, or cough.

What could be going on?

This is a middle aged man with crushing chest pain that is worse in intensity and duration than previously. Things that can cause chest pain can include the muscular wall (from overworking muscles), the lungs, parenchyma and pleura (infection or fluid), the heart, either from decreased blood flow to the muscle or inflammation of the pericardial sac, the aorta, the pulmonary vessels, and gastrointestinal causes. Patients can often experience chest discomfort with psychological problems also.

It is possible that the pain could be musculoskeletal, GERD, pericarditis, myocardial infarction (MI), unstable angina (UA), anxiety, aortic stenosis, pericardial effusion, pulmonary embolism, pneumothorax, pulmonary infection, or aortic dissection.

In addition to the information gathered in the history of present illness (HPI), what other review of systems (ROS) would you like?

Any fever, change in weight or energy level, change in exercise capacity, lightheadedness, wheezing, palpitations, new lower extremity edema, abdominal pain, BRBPR (bright red blood per rectum), melena, episodes of syncope. It would be helpful also to know if his previous chest pain has been increasing in frequency or intensity.

The patient tells you he is having some lightheadedness, and that his chest pain has been occurring about once per week for one month which is more frequent than usual.

What other history would you like to know?

Past medical history, Past surgical history, Smoker, Drinker, Work type, Marital status, Family History, Medications, Allergies.

Past Medical History: hypertension (HTN), hyperlipidemia, and non-insulin dependent diabetes mellitus (NIDDM)
Social History: married, 50 pack year smoking history, occasional alcohol intake
Past Surgical History: none
Family History: father and brother passed away from myocardial infarction (MI) in their 50's
Meds: hydrochlorothiazide (HCTZ), simvistatin, glucophage

Allergies: none

What physical exam finding would you look for?

First, you want to know the vital signs. Is the patient febrile, tachycardic, tachypnic, hyper or hypotensive, hypoxic? Does the patient look uncomfortable and in pain? The patient's overall color (looking for pale or jaundice), any rubs, gallops, or muffled heart sounds? Does the patient have rales, crackles, wheezes, or decreased breath sounds? Is the belly tender? Hypo or hyperactive bowel sounds?

Your patient's vital signs are stable. He does appear quite uncomfortable, is diaphoretic, and clutching his chest. You hear a 4^{th} heart sound (evidence of non-compliant heart; often secondary to hypertension) and some pulmonary rales bilaterally (what would cause that in the setting of an MI?)

What labs/imaging studies would you like to order in a patient with chest pain and SOB with a classic MI picture?

There will be times when you see a patient who needs help immediately- even before you finish your H&P and definitely before you write your note. This is one of those patients. Within seconds of seeing this gentleman it would be a good idea to get some oxygen on him, give him an aspirin, get an i.v. started and order a few basic tests like an EKG, CBC, and a set of cardiac enzyme markers. Alerting a resident or staff about the patient is a good idea also.

That said,

CBC- Could detect anemia that when combined with clogged coronary arteries causes heart damage or leukocytosis (increased white blood cell count)
EKG- looking for any interval change from old EKG, ST segment changes (elevation or depression), inverted T waves, new bundle branch block (BBB) esp left sided, and q waves.
Cardiac markers- This includes creatinine kinase (CK), and creatinine kinase myocardial band (CK-MB), and troponin. CK and CK-MB rise and disappear quickest and are not extremely specific. Troponin is the most sensitive and specific. It appears at 3-6 hrs and remains for 14 days. Even troponin can be falsely elevated in the setting of renal failure and cardiac arrhythmias (supraventricular tachycardia)
Basic metabolic panel (BMP)- to check renal function and electrolytes
Chest X- Ray (CXR)- looking for signs of infection, effusion, or wide mediastinum
Echocardiogram (ECHO)- To look for wall motion abnormalities, change if ejection fraction (EF) from previous study, valvular abnormalities, and pericardial effusion.
Percutaneous cardiac intervention (PCI)- This will be up to the cardiologist.

Your patient had a hemoglobin of 10, ST elevation in leads V1, V2, V3, and V4, his cardiac markers were elevated. BMP and CXR were normal. ECHO revealed decreased anterior wall motion.

What exam would you DEFINITELY NOT order?

Stress ECHO. NEVER perform a stress echo on someone with new or worsening chest pain. This could be or become an infarct and exercising is a bad thing in that setting.

What is the diagnosis?

This is a classic presentation for myocardial infarction.

With this disease process the damage occurs because of decrease oxygen to the myocardium. This can happen because of clogged coronary arteries, decreased hemoglobin, or if the arteries spasm down, as is the case with Prinzmetal's angina or cocaine use.

What you should carry away from this case:

1. Emergency presentations should be handled as such. If this person is infracting they need help immediately.

2. Risk factors for MI:
    a. diabetes mellitus (same risk as patient that has previously had an MI)
    b. previous MI
    c. HTN
    d. hyperlipidemia
    e. smoking
    f. sedentary lifestyle
    g. family history of MI
    h. male
    i. between 40-70 years old

3. The chest pain with an MI or UA is usually and crushing or pressure type pain. Pain that disappears with rest or nitroglycerin (NTG) is more likely UA. Pain that lasts > 30 minutes is most likely an MI.

4. Not all patients will present so classically. Some may arrive just with neck pain or lightheadedness. This rule holds especially true for women, elderly patients, and patients with DM.

Summary of treatment

1. Reperfusion: either TPA (only with S-T elevation MIs) or PCI
2. nitroglycerin
3. morphine
4. oxygen
5. place patient on telemetry
6. Aspirin/heparin/glycoprotein IIb/IIIa receptor antagonist

7. Beta blocker (only if patient is hemodynamically stable)
8. Statin
9. ACE- Inhibitor (only if patient is hemodynamically stable)
10. Heart healthy diet
11. Cardiac rehabilitation

The cardiologist visit your patient and decide to take him to the cathedarization lab where they find multiple large vessel disease and recommend coronary artery bypass grafting (CABG). The patient was given plavix in the E.D. so it will take a few days for this to leave his system and the operation to be performed. Three days later he complains to his nurse that his right hand and leg are weak. What is happening?

When cardiac blood flow is made turbulent this increases the likelihood of developing a clot. This patient most likely developed such a clot because of poor wall motion, subsequently lodged the clot in a left sided brain vessel, and is having an ischemic stroke.