

## 20 Questions – Cardiac Chest Pain

1. You are called to US Bank field after the Vikings lose. Several patients are having chest pain. One has left arm pain, the other has bilateral arm pain. Who is more likely to be having an MI?
2. Patient #1 states that he had some Maalox with him and that he feels better after taking a swig. What percentage of patients with an MI will have relief with antacids?
3. Patient #2 states that his pain is pleuritic (increases with respiration). What percentage of patients with acute MI have a pleuritic chest pain component?
4. After both receive aspirin and nitro, both patients feel improved. Patient #1 recalls that he has been diagnosed with esophageal spasm in the past. Does nitro relieve the pain of esophageal spasm?
5. On monitor, both patients have ST elevation. Patient #1 has anterior ST elevation 3mm in V2-4, patient #2 has 6mm of ST segment elevation in leads II and III. Who is at higher risk for a poor outcome?
6. What is the optimum time window in which to perform a cardiac cath?
7. What are the 6 life-threatening causes of chest pain that you should all know backwards and forwards? (For purposes of the question, you may answer in either direction).
8. Your patient has left bundle branch block on the ECG – what are the chances that this is caused by an acute MI?
9. Patient #2 is now exhibiting Levine's sign. What is he doing?
10. What makes angina "unstable"?
11. Patient #1 is now diaphoretic, Patient #2 is dyspneic. Which of these is more likely to be associated with cardiac chest pain?
12. Patient #1 suddenly collapses in VF arrest, but is resuscitated after 5 minutes of CPR. What are the chances that a heart attack caused his arrest?
13. Why get an ECG before giving nitroglycerine?
14. What percentage of patients with an MI will have the diagnosis made by EKG?
15. Why is aspirin important in cardiac chest pain?
16. What non-cardiac structures can cause chest pain similar to cardiac ischemia?
17. Is chest pain that comes on at rest or under stress in an otherwise healthy person ever cardiac?
18. Examining your patient, you find that he has some reproducible chest tenderness. What percentage of patients with MI have chest tenderness?
19. What is an "angina equivalent"?
20. Patient #1 has chest "pressure", patient #2 describes his pain as "sharp". Who is more likely to be having an MI?

## 20 Answers – Cardiac Chest Pain

1. Interestingly, even though left arm radiation (usually to the ulnar side) is more predictive than no radiation, radiation to BOTH arms is even more specific for an acute MI.
2. Though relief may be incomplete, about 15-20% of patients with acute MI will improve after antacids. Probably more denial than anything else...
3. 19% of patients in one study who had acute MI reported that their pain was pleuritic! (this should also make you worry about pneumothorax, pleurisy, PE, pericarditis, etc.)
4. The esophagus is smooth muscle for most of its length. NTG relaxes smooth muscle both in the walls of blood vessels, and in the wall of the esophagus, effectively relieving both pains.
5. Anterior infarcts involve more muscle mass (on average) than inferior infarcts and cause more effect on the function of the left ventricle. Degree of ST segment elevation is not generally useful in individual cases at predicting size of infarct. Loss of muscle predicts outcome, thus inferior infarcts usually do better than anterior. However, if there is right ventricular involvement with an inferior MI, the complication rate is greatly increased. (You can only tell this with a R sided EKG however...)
6. The most muscle is saved when intervention occurs within 2 hours after symptom onset. The faster, the better – our goal is to get the vessel open within 90 minutes of arrival at the hospital, and usually much faster. However, most people wait between 3-6 hours to get

medical help. This is a bad combination. By 6 hours, only about 15% of the affected muscle can be saved.

7. Cardiac ischemia (MI or angina), aortic dissection, pneumothorax, PE, pericarditis, esophageal rupture (Try PIPPED – PE, Ischemia, PTX, Pericarditis, Esophageal rupture, Dissection. Or, invent your own!)
8. Less than 10% - new onset LBBB is rarely associated with acute infarction – it used to be considered an indicator for treatment but not anymore – most of the time it's old and even when new isn't necessarily associated with acute ischemia.
9. Levine's sign is when the patient clenches his fist and holds it to his sternum when describing or experiencing pain. This sign, when present, is highly correlated with cardiac ischemia.
10. Stable angina is predictable chest pain occurring with a certain level of exertion. It is caused by a chronic narrowing in a coronary artery. Unstable angina generally represents new changes in the vessel wall, and is correlated with an impending MI unless treated. Generally, we call angina unstable if it: a) occurs at rest b) occurs with less exertion than before c) occurs with increased frequency and severity.
11. Diaphoresis has higher correlation with MI, though both are common symptoms in the setting of chest pain.
12. About 1/3 of VF arrest patients are found to have a specific lesion that may have been the 'culprit' which is high enough that we routinely take resuscitated VF arrests to the cath lab for assessment.
13. Often, the ST changes associated with ischemia (and sometimes STEMI) can vanish after the vasodilator effects of nitro. The few minutes it takes to get the ECG won't make any difference in the patient's outcome, but missing the diagnosis can be a huge problem – we always appreciate the EMS ECG!
14. Only about 25-50%. In fact, more than 20% of patients with MI will have normal EKGs.
15. Platelet clumping is the first step in forming clot – giving aspirin helps inhibit clot formation rapidly after oral administration to prevent clot from forming in a coronary artery. A single aspirin reduces mortality from MI by 23%! Plavix is like super aspirin in its effects.
16. Aorta and pulmonary vessels, pleura, bronchial tree, mediastinum, esophagus, diaphragm, chest wall, neck, stomach, gallbladder, pancreas, duodenum, brain (anxiety). Unfortunately, because the nerves to these areas aren't very specific, pain from any of these sources can mimic cardiac pain, and vice versa.
17. Yes. Prinzmetal's angina is spasm of the coronary arteries that is NOT associated with a fixed lesion. It classically comes on with rest and anxiety, is more common in females, and can be provoked with hyperventilation. Usual treatment is with calcium channel blockers.
18. 15% of patients with MI have a reproducible component of chest tenderness.
19. Anginal equivalents occur in patients whose nerves don't conduct information in the expected fashion. Examples would be elderly patients, diabetics, and other chronically ill folks, though occasionally younger people have these as well. Essentially, it is a non-pain representation of cardiac ischemia. The most common is episodic shortness of breath, but recurrent nausea, weakness and diaphoresis, fatigue, and other complaints are also seen, and may be the only clue to a major cardiac problem!
20. Sharp and stabbing pain represents an MI in only 5% of cases (but is angina in up to 17%). Pressure discomfort represents MI on average 24% of the time, with 30% of cases representing unstable angina (so 54% cardiac cause).

**Don't forget your partner this Halloween!**  
**(Chocolate always makes for a nice shift...)**