

USMLE Step 2: Determine the next step in managing chest pain

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If you're preparing for the United States Medical Licensing Examination® (USMLE®) Step 2 exam, you might want to know which questions are most often missed by test takers. Check out this example from Kaplan Medical, and view an expert video explanation of the answer. Also check out all posts in this series.

This month's stumper

A 59-year-old ranch hand presents to the outpatient department with chest pain. Over the past eight months, he has noticed a dull, central chest pain that radiates to his left arm and jaw while walking. The pain subsides after about two minutes of rest but quickly returns upon walking again. This is severely affecting his work, and he is concerned that he will lose his job because of poor productivity. His vital signs are: temperature, 37 °C (98.6 °F); pulse, 74 beats per minute; and blood pressure, 135/82 mm Hg. Stress test reveals ST-segment depression in leads I, aVL, V4, V5 and V6.

Aspirin, nitrates and metoprolol are initiated. A 12-hour fasting serum LDL cholesterol concentration is 140 mg/dL. He is also started on atorvastatin and advised to implement a low-fat diet. Two months later, the patient returns and is still experiencing chest pain during exercise. However, he states that his productivity at the farm has increased. His resting pulse is 58 beats per minute. Echocardiogram reveals an ejection fraction of 55 percent.

What is the next best step in management?

- A. Eptifibatide and then perform a percutaneous transluminal coronary angioplasty
- B. Tirofiban
- C. Coronary angiography

D. Lisinopril

E. Coronary artery bypass graft (CABG)

The correct answer is C.

Kaplan Medical explains why

This patient has stable angina with symptoms affecting his livelihood. He is placed on aspirin, nitrates, a beta-blocker and a statin; however, angina-like symptoms are reported two months later. Maximal medical therapy has been achieved; an important part of medical therapy is a goal heart rate of 55 – 60 beats per minute. If this goal is not met, the next step is to increase the dose of metoprolol. Coronary angiography is only done with stable angina when a patient is still having symptoms of optimal medical management.

Heart rate goal is an important part of medical management, thus he should undergo coronary angiography. The coronary angiogram maps out the diseased vessels and dictates future management, such as angioplasty or stenting. If the angiogram shows left main coronary artery disease, or two- or three-vessel disease, he would be a candidate for CABG.

Why the other answers are wrong

Read these explanations to understand the important rationale for why each answer is incorrect.

Choices A and B: Eptifibatide, percutaneous transluminal coronary angioplasty and tirofiban are incorrect because there is no statistically significant data to suggest that giving tirofiban or eptifibatide lowers mortality in stable angina. These drugs are used for acute coronary syndrome. They act as glycoprotein IIb/IIIa inhibitors and have a pronounced antiplatelet effect; when given to patients post-PTCA, they reduce the risk of stent re-stenosis. Both drugs carry a risk of hemorrhage, though the risk is greater with eptifibatide than with tirofiban.

Choice D: Lisinopril is incorrect, but brings up a very good high-yield point for the USMLE: when to give an ACE inhibitor to a patient with stable angina. The indications for prescribing an ACE inhibitor in a patient with stable angina are: 1) diabetes, 2) hypertension, 3) low ejection fraction (less than 50

percent) and 4) the presence of proteinuria. This patient does not fit into any these categories (his ejection fraction on echo is 55 percent). ACE inhibitors have been shown to reduce mortality in patients with heart failure and diabetes.

Choice E: CABG is not appropriate until the extent of coronary disease has been determined, as described above.

Tips to remember

When maximal pharmacologic therapy for the treatment of stable angina has been reached (this is a combination and maximal doses of a beta-blocker, aspirin, statin and nitrates with persistence of symptoms), the next step is percutaneous coronary angiography. The extent of coronary disease will dictate whether angioplasty with stenting or coronary bypass grafting is indicated.

For more prep questions on USMLE Steps 1 and 2, view other posts in this series.