

Sample PANRE Questions

Question 1

A 55-year-old man comes to the emergency department because he has had pressure-like pain in the substernal region of his chest for the past 20 minutes. The patient says the pain radiates to his left arm. He is nauseated and sweating profusely. Medical history includes long-standing hypertension that is well controlled with diuretics. On the basis of this patient's history and symptoms, which of the following pathologic processes is most likely to have occurred first?

- A. Activation of factor VII
- B. Activation of factor IX
- C. Activation of protein S
- *D. Adhesion of platelets
- E. Conversion of fibrinogen to fibrin

Content Area: Cardiovascular System

Critique:

This question tests the examinee's ability to identify the pathologic basis for the sudden development of acute myocardial infarction.

The correct answer is Option (D), adhesion of platelets. The patient described in the scenario has characteristic symptoms of acute myocardial infarction, including pain in the substernal region of the chest that radiates to the left arm as well as diaphoresis. After disruption of the atherosclerotic plaque, platelets attach to the area due to the increase in turbulence as well as the exposed plaque and collagen. This results in aggregation of platelets and increased thrombi in the vasculature.

Option (A), activation of factor VII, is incorrect because tissue factor is first activated before converting factor VII to factor VIIa via the extrinsic pathway. Option (B), activation of factor IX, is incorrect because this is not the first factor activated. Option (C), activation of protein S, is incorrect because protein S acts as a cofactor to deactivate factor Va and factor VIIIa and therefore is not involved in the initial formation of a clot. Option (E), conversion of fibrinogen to fibrin, is incorrect because this represents the end of the coagulation cascade.

References:

1. Mohler ER, Schafer AI. Atherothrombosis: disease initiation, progression, and treatment. In: Kaushansky K, Lichtman MA, Prchal JT, et al, eds. *Williams Hematology*. 9th ed. New York, NY: McGraw-Hill.

<http://accessmedicine.mhmedical.com/content.aspx?bookid=1581sectionid=108085670>.

Accessed July 3, 2018.

2. Mosnier LO, Griffin JH. Control of coagulation reactions. In: Kaushansky K, Lichtman MA, Prchal JT, et al, eds. *Williams Hematology*. 9th ed. New York, NY: McGraw-Hill.

<http://accessmedicine.mhmedical.com/content.aspx?bookid=1581sectionid=108080365>.

Accessed July 3, 2018.

Question 2

A 67-year-old woman comes to the clinic for routine physical examination. Medical history includes hypertension, type 2 diabetes mellitus, and dyslipidemia, which are well managed with medications. As the patient walks into the examination room, she describes an aching pain behind her sternum that radiates to her left breast. She says she has never had this type of pain before, and the pain does not worsen when she changes positions. The patient has shortness of breath and is slightly diaphoretic. Pulse rate is 105/min and regular, respirations are 24/min, and blood pressure is 146/91 mmHg. Oxygen saturation is 97% on room air. Which of the following is the most likely cause of this patient's symptoms?

- A. A communication between ventricles
- B. Dilation of the aortic root
- C. Ectopic electrical activity
- D. Inflammation of the pericardial sac
- *E. Plaque rupture with platelet aggregation

Content Area: Cardiovascular System

Critique:

This question tests the examinee's ability to recognize characteristic symptoms of myocardial infarction and identify the underlying pathologic process of this condition.

The correct answer is Option (E), plaque rupture with platelet aggregation. The patient described in the scenario has characteristic symptoms of myocardial infarction, including chest pain, shortness of breath, and diaphoresis. The underlying pathologic process of myocardial infarction is plaque rupture with platelet aggregation.

Option (A), a communication between ventricles, is incorrect because the acute symptoms described in the scenario would most likely not be caused by this process. Option (B), dilation of the aortic root, is incorrect because patients with this condition typically have no symptoms. Option (C), ectopic electrical activity, is incorrect because the symptoms described in the scenario are not characteristic of a conduction disorder. Option (D), inflammation of the pericardial sac, is incorrect because the patient does not have pain that worsens with changes in position, which is characteristic of pericarditis.

References:

1. Bashore TM, Granger CB, Jackson KP, Patel MR. Heart disease. In: Papadakis MA, McPhee SJ, Rabow MW, eds. *Current Medical Diagnosis & Treatment 2019*. New York, NY: McGraw-Hill. <http://accessmedicine.mhmedical.com/content.aspx?bookid=2449§ionid=194435482>. Accessed September 12, 2018.
2. Buckley C II, Garcia B. Cardiac arrhythmias. In: Stone C, Humphries RL, eds. *Current Diagnosis & Treatment: Emergency Medicine*. 8th ed. New York, NY: McGraw-Hill. <http://accessmedicine.mhmedical.com/content.aspx?bookid=2172§ionid=165064676>. Accessed September 12, 2018.
3. Cannon CP, Braunwald E. Non-ST-segment elevation acute coronary syndrome (non-ST-segment elevation myocardial infarction and unstable angina). In: Kasper D, Fauci A, Hauser S, Longo D, Jameson J, Loscalzo J, eds. *Harrison's Principles of Internal Medicine*. 19th ed. New York, NY: McGraw-Hill; 2014. <http://accessmedicine.mhmedical.com/content.aspx?bookid=1130§ionid=79743570>. Accessed July 3, 2018.
4. Maron BA, Gersh BJ, O'Gara PT. The evaluation and management of stable ischemic heart disease. In: Fuster V, Harrington RA, Narula J, Eapen ZJ, eds. *Hurst's The Heart*. 14th ed. New York, NY: McGraw-Hill. <http://accessmedicine.mhmedical.com/content.aspx?bookid=2046§ionid=176556990>. Accessed August 7, 2018.
5. O'Gara PT, Loscalzo J. Aortic regurgitation. In: Jameson J, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J, eds. *Harrison's Principles of Internal Medicine*. 20th ed. New York, NY: McGraw-Hill. <http://accessmedicine.mhmedical.com/content.aspx?bookid=2129§ionid=192029428>. Accessed September 12, 2018.

Question 3

A 57-year-old woman comes to the office because she has had pain in the left side of her chest for the past hour. The patient says the pain worsened as she crossed the parking lot to the office. During the past three months, she has had pain in her left shoulder and breast that worsens with exertion and is relieved with rest. She also has had fatigue during this time. Medical history includes hypertension and chronic obstructive pulmonary disease, which are well controlled. The patient smokes one pack of cigarettes daily. Height is 170.2 cm (5 ft 7 in), and weight is 99.8 kg (220 lb). Pulse rate is 112/min, respirations are 24/min, and blood pressure is 180/76 mmHg. Oxygen saturation is 96% on room air. On physical examination, palpation of the chest does not worsen the pain. Which of the following is the most appropriate next step?

- A. Discuss weight loss strategies with the patient
- B. Recommend smoking cessation
- C. Refer the patient to a bariatric surgeon
- D. Schedule consultation with a pulmonologist
- *E. Send the patient to the emergency department

Content Area: Cardiovascular System

Critique:

This question tests the examinee's ability to identify the clinical presentation of myocardial infarction based on the risk factors and symptoms and determine the need for evaluation in the emergency department.

The correct answer is Option (E), send the patient to the emergency department. The patient described in the scenario has multiple risk factors for myocardial infarction, including older age, history of hypertension and chronic obstructive pulmonary disease, history of cigarette smoking, and obesity. In addition, the patient's history of chest pain on exertion suggests that her myocardial oxygen needs are not being met. On the basis of these findings, evaluation in the emergency department for myocardial infarction is the most appropriate next step.

Option (A), discuss weight loss strategies with the patient, and Option (B), recommend smoking cessation, are incorrect because the patient has an acute condition that must be managed before discussion of modifiable risk factors is appropriate. Option (C), refer the patient to a bariatric surgeon, is incorrect because the patient has acute symptoms that must be evaluated before this weight loss strategy is considered. Option (D), schedule consultation with a pulmonologist, is incorrect because the patient's acute coronary symptoms are potentially life-threatening and must be addressed before further pulmonary evaluation.

References:

1. Hollander JE, Diercks DB. Acute coronary syndromes. In: Tintinalli JE, Stapczynski J, Ma O, Yealy DM, Meckler GD, Cline DM, eds. *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*. 8th ed. New York, NY: McGraw-Hill; 2016.

<http://accessmedicine.mhmedical.com/content.aspx?bookid=1658§ionid=109449629>.

Accessed July 7, 2018.

2. Paganini A, Blue DE, Elmoselhi A. Ischemic heart disease and management drugs. In: Elmoselhi A, ed. *Cardiology: An Integrated Approach*. New York, NY: McGraw-Hill.

<http://accessmedicine.mhmedical.com/content.aspx?bookid=2224§ionid=171660665>.

Accessed July 7, 2018.