

1. A 62-year-old patient with long-standing hypertension and hyperlipidemia presents with exertional chest pain that resolves with rest. The underlying mechanism most accurately reflects:

- A) Complete thrombotic occlusion leading to transmural infarction
- B) Fixed atherosclerotic narrowing causing supply-demand mismatch during stress
- C) Coronary vasospasm causing transient total occlusion at rest
- D) Microvascular embolization causing patchy myocardial necrosis

2. In the context of myocardial ischemia, the transition from reversible injury to irreversible necrosis is most critically determined by:

- A) Degree of endothelial dysfunction alone
- B) Duration and severity of perfusion reduction
- C) Presence of collateral circulation exclusively
- D) Absolute oxygen content in arterial blood

3. A patient develops chest pain at rest with increasing frequency. The most plausible pathophysiological explanation involves:

- A) Stable plaque with thick fibrous cap
- B) Plaque rupture with superimposed platelet-rich thrombus
- C) Fixed stenosis without endothelial dysfunction
- D) Chronic hypoxia without ischemia

4. Which statement best explains why ischemia affects the left ventricle more prominently?

- A) The right ventricle has higher oxygen demand
- B) Coronary perfusion occurs mainly during systole in the left ventricle
- C) The left ventricle has greater wall stress and oxygen demand
- D) The right coronary artery supplies less myocardium

5. During ischemia, myocardial metabolism shifts toward:

- A) Increased fatty acid oxidation
- B) Aerobic glycolysis
- C) Anaerobic glycolysis with lactate accumulation
- D) Ketone body utilization

6. Endothelial dysfunction contributes to atherosclerosis primarily by:

- A) Enhancing vasodilation and anticoagulation
- B) Preventing LDL oxidation
- C) Promoting vasoconstriction, thrombosis, and inflammation

D) Increasing oxygen delivery to tissues

7. A thin fibrous cap over an atherosclerotic plaque predisposes to:

A) Stable angina

B) Reduced platelet aggregation

C) Plaque rupture and acute coronary syndrome

D) Decreased inflammatory response

8. In NSTEMI, the infarction is typically:

A) Transmural affecting all layers

B) Subendocardial due to partial occlusion

C) Limited to epicardial surface

D) Independent of coronary blood flow

9. Which ECG change is most associated with subendocardial ischemia?

A) ST elevation

B) Q waves

C) ST depression

D) Peaked T waves

10. Collateral circulation is most beneficial in:

A) Sudden complete occlusion

B) Gradual atherosclerotic narrowing

C) Acute embolism

D) Immediate plaque rupture

11. The imbalance in oxygen supply and demand in IHD primarily results from:

A) Increased oxygen supply only

B) Reduced demand only

C) Reduced supply and/or increased demand

D) Increased hemoglobin affinity for oxygen

12. Which of the following best describes unstable angina?

A) Predictable pain relieved by rest

B) Pain lasting less than 2 minutes

C) Pain occurring at rest with increasing severity

D) Pain only during exercise

13. The primary cause of myocardial infarction is:

- A) Coronary artery spasm alone
- B) Atherosclerotic plaque rupture with thrombosis
- C) Increased cardiac output
- D) Decreased venous return

14. Which factor is considered non-modifiable in coronary artery disease?

- A) Smoking
- B) Hypertension
- C) Age
- D) Hyperlipidemia

15. The earliest biochemical change during ischemia is:

- A) Cell death
- B) ATP depletion
- C) Fibrosis
- D) Collagen deposition

16. Electrical instability in ischemia may lead to:

- A) Bradycardia only
- B) Ventricular tachycardia and fibrillation
- C) Atrial enlargement
- D) Valve stenosis

17. Which layer of the heart is most vulnerable to ischemia?

- A) Epicardium
- B) Outer myocardium
- C) Subendocardium
- D) Pericardium

18. A patient with complete coronary occlusion will most likely develop:

- A) Stable angina
- B) NSTEMI
- C) STEMI
- D) No symptoms

19. The role of LDL in atherosclerosis involves:

- A) Reducing inflammation
- B) Oxidation leading to foam cell formation
- C) Preventing macrophage activation
- D) Enhancing endothelial repair

20. Which condition increases myocardial oxygen demand?

- A) Bradycardia
- B) Hypotension
- C) Hypertension
- D) Hypothermia

21. Platelet aggregation in coronary arteries leads to:

- A) Vasodilation
- B) Thrombus formation
- C) Increased oxygen supply
- D) Reduced blood viscosity

22. The main determinant of coronary perfusion is:

- A) Systolic pressure
- B) Diastolic pressure
- C) Heart rate alone
- D) Venous return

23. Which complication is most fatal in early MI?

- A) Fibrosis
- B) Arrhythmia
- C) Hypertrophy
- D) Valve disease

24. A transmural infarction affects:

- A) Inner layer only
- B) Outer layer only
- C) Full thickness of myocardium
- D) Endocardium only

25. Which symptom is most characteristic of myocardial infarction?

- A) Mild transient discomfort

B) Severe prolonged chest pain

C) Headache

D) Muscle pain

26. Which mechanism explains ST elevation?

A) Subendocardial ischemia

B) Transmural ischemia

C) Potassium intake

D) Low heart rate

27. Atherosclerosis most commonly affects:

A) Veins

B) Capillaries

C) Epicardial coronary arteries

D) Lymphatics

28. Which worsens angina?

A) Rest

B) Reduced workload

C) Anemia

D) Oxygen therapy

29. Primary goal in MI management:

A) Increase viscosity

B) Reduce workload & restore perfusion

C) Decrease oxygen

D) Vasoconstriction

30. Most critical factor determining infarct size:

A) Age

B) Duration of ischemia

C) Sex

D) Blood pressure

31. Ischemia and hypoxia produce identical pathological effects in myocardium. (True/False)

32. Plaque rupture depends mainly on lipid core size not fibrous cap. (True/False)

33. Subendocardium is more vulnerable due to pressure and reduced perfusion. (True/False)

34. Collateral circulation may reduce but not prevent MI. (True/False)

35. Ionic imbalance leads to arrhythmias. (True/False)

Answers:

MCQs: 1-B,2-B,3-B,4-C,5-C,6-C,7-C,8-B,9-C,10-B,11-C,12-C,13-B,14-C,15-B,16-B,17-C,18-C,19-B,20-C,21-B,22-B,23-B,24-C,25-B,26-B,27-C,28-C,29-B,30-B

True/False: 31-False, 32-False, 33-True, 34-True, 35-True