Complete Arrhythmia - 30 MCQ Questions

1. Which of the following BEST describes arrhythmia according to the lecture content?

A. A physiological increase in heart rate occurring exclusively during exercise without alterations in conduction pathways

B. Any disturbance in the formation, conduction, frequency, or rhythm of cardiac electrical impulses resulting in abnormal cardiac rhythm

C. Complete absence of electrical activity within the myocardium caused only by ventricular fibrillation

D. A condition limited to structural defects of the cardiac valves without involvement of electrical conduction pathways

2. Which of the following structures normally possesses the highest intrinsic pacemaker activity in the heart?

A. Purkinje fibers

B. Bundle branches

C. SA node

D. AV node

3. Which of the following BEST explains why Purkinje fibers conduct impulses more rapidly than ventricular muscle fibers?

A. Purkinje fibers possess slower sodium influx and prolonged refractory periods

B. Purkinje fibers contain specialized conduction tissue adapted for rapid electrical transmission

C. Ventricular muscle fibers lack gap junctions and therefore cannot depolarize efficiently

D. Purkinje fibers generate impulses exclusively through calcium-dependent depolarization

4. Which of the following ECG intervals primarily represents conduction through the AV node?

A. QT interval

B. ST interval

C. PR interval

D. QRS duration

5. Which of the following BEST describes the QRS complex according to the lecture?

A. Atrial repolarization only

B. Ventricular depolarization accompanied by atrial repolarization

C. Ventricular repolarization only

D. SA nodal automaticity and atrial depolarization exclusively

6. Which of the following is considered normal sinus rhythm according to the lecture?

A. 20–40 beats per minute

B. 40–60 beats per minute

C. 60–100 beats per minute

D. More than 150 beats per minute

7. Which of the following BEST defines sinus bradycardia?

A. Irregular atrial rhythm associated with absent P waves

B. Abnormally slow heart rhythm with heart rate below 60 beats per minute

C. Ventricular rhythm exceeding 120 beats per minute

D. Complete dissociation between atrial and ventricular contractions

8. Which of the following autonomic influences would MOST likely increase sinus node firing rate?

A. Increased parasympathetic stimulation of the AV node

B. Increased sympathetic tone and circulating catecholamines

C. Increased acetylcholine release onto the SA node

D. Suppression of β■-adrenergic receptor activity within nodal tissue

9. Which of the following conditions is classified as an extrinsic cause of sinus bradycardia according to the lecture?

A. Infarction of the SA node

B. Acute ischemia of nodal tissue

C. Hypothyroidism and hypothermia

D. Congenital bundle branch fibrosis exclusively

10. Which of the following ECG findings is MOST characteristic of sinus bradycardia?

A. Shortened QT interval with absent P waves

B. Prolonged R–R interval due to reduced sinus rate

C. Widened QRS complexes associated with ventricular fibrillation

D. Irregular baseline fibrillation waves with absent ventricular activity

11. Which of the following BEST defines sinus tachycardia?

A. Complete AV nodal block causing ventricular escape rhythm

B. Abnormally rapid heart rhythm originating from increased SA node activity

C. Ventricular depolarization occurring independently of atrial impulses

D. Permanent suppression of nodal automaticity due to ischemic injury

12. Which of the following mechanisms is directly involved in abnormal impulse formation during sinus tachycardia?

A. Automaticity and triggered activity

B. Fibrosis and ventricular hypertrophy exclusively

C. AV nodal necrosis and myocardial rupture

D. Platelet aggregation within coronary arteries only

13. Which of the following BEST describes early afterdepolarization according to the lecture?

A. It occurs after complete repolarization and is typically associated with digitalis toxicity

B. It arises during phases 2 or 3 of repolarization and is associated with long QT syndrome

C. It occurs exclusively during atrial depolarization and suppresses ventricular activity

D. It permanently inhibits sodium channels and prevents reentry circuits

14. Which of the following BEST describes delayed afterdepolarization?

A. It develops during ventricular depolarization before phase 0 is completed

B. It occurs after repolarization is complete and is commonly associated with digitalis toxicity

C. It suppresses ectopic pacemaker activity through potassium channel blockade

D. It is caused primarily by prolonged AV nodal conduction and bundle branch block

15. Which of the following is REQUIRED for initiation of a reentry circuit according to the lecture?

A. Simultaneous conduction through both pathways without delay

B. Unidirectional block in one pathway with slow conduction in the alternate pathway

C. Complete absence of refractory periods in cardiac tissue

D. Total suppression of ectopic impulse formation within the myocardium

16. Which of the following BEST explains the mechanism of reentry tachyarrhythmia?

A. Permanent suppression of all conduction pathways except the SA node

B. Circulating electrical impulse repeatedly activating tissue through a closed-loop conduction pathway

C. Inhibition of automaticity by parasympathetic stimulation causing ventricular standstill

D. Destruction of Purkinje fibers resulting in rapid synchronized ventricular depolarization

17. Which of the following conditions is considered an acute cause of sinus tachycardia according to the lecture?

A. Hyperthyroidism and pregnancy

B. Exercise, fever, and acute heart failure

C. Hypothermia and hypothyroidism

D. Increased intracranial pressure and SA nodal infarction

18. Which of the following conditions is considered a chronic cause of sinus tachycardia according to the lecture?

A. Pain and emotional stress

B. Acute myocardial infarction

C. Pregnancy and anemia

D. Digoxin toxicity and hypothermia

19. Which of the following BEST defines an ectopic beat?

A. A delayed ventricular contraction occurring after prolonged refractory periods

B. A premature cardiac contraction originating from abnormal ectopic foci within the heart

C. Complete suppression of SA nodal activity due to AV nodal fibrosis

D. Simultaneous atrial and ventricular standstill caused by ischemia

20. Which of the following is a possible cause of ectopic foci according to the lecture?

A. Local ischemia and toxic irritation caused by nicotine or caffeine

B. Exclusive suppression of sympathetic tone within ventricular tissue

C. Permanent closure of all coronary vessels simultaneously

D. Complete absence of myocardial excitability due to fibrosis

21. Case: A 70-year-old patient presents with fatigue, dizziness, and ECG findings showing PR interval prolongation greater than 0.22 seconds while every atrial impulse is still conducted to the ventricles. Which condition BEST explains these findings?

A. Second-degree heart block

B. Third-degree heart block

C. First-degree heart block

D. Ventricular fibrillation

22. Case: A patient's ECG demonstrates that some P waves are conducted to the ventricles while others are not. Every second or third P wave fails to produce ventricular depolarization. Which diagnosis is MOST likely?

A. Sinus tachycardia

B. Second-degree heart block

C. First-degree heart block

D. Atrial fibrillation

23. Case: A patient develops complete dissociation between atrial and ventricular activity. The atrial rate remains 60–100 bpm, whereas ventricular escape rhythm is 40–60 bpm. Which condition BEST explains this presentation?

A. Third-degree complete heart block

B. Sinus bradycardia

C. Premature atrial contraction

D. Ventricular tachycardia

24. Case: A patient with acute myocardial infarction suddenly develops chaotic ventricular electrical activity. The ventricles quiver ineffectively and circulation ceases immediately. Which arrhythmia is MOST likely

present?

A. Atrial fibrillation

B. Sinus tachycardia

C. Ventricular fibrillation

D. First-degree AV block

25. Case: ECG recording demonstrates absence of P waves with irregular baseline fibrillation waves and irregular QRS intervals. Which arrhythmia BEST explains these findings?

A. Atrial fibrillation

B. Ventricular fibrillation

C. Sinus bradycardia

D. Complete heart block

26. Case: A patient with digoxin toxicity develops anorexia, nausea, vomiting, bradycardia, and multiple ventricular ectopic beats. Which mechanism BEST explains the arrhythmogenic effect of digoxin toxicity?

A. Excessive suppression of all myocardial depolarization

B. Triggered activity producing delayed afterdepolarizations

C. Complete blockade of all calcium channels in nodal tissue

D. Permanent inhibition of sympathetic stimulation to the SA node

27. Case: A patient with recurrent tachyarrhythmias is treated with propranolol. Which mechanism BEST explains the anti-arrhythmic effect of this drug according to the lecture?

A. Selective blockade of L-type calcium channels in ventricular muscle

B. Reduction of sympathetic stimulation leading to decreased automaticity and prolonged AV conduction

C. Direct stimulation of β-adrenoceptors to increase conduction velocity

D. Enhancement of sodium influx during phase 0 depolarization

28. Case: A patient is treated with amiodarone for severe ventricular arrhythmia. Which mechanism BEST describes the pharmacological action of this drug?

A. Selective blockade of muscarinic receptors within the SA node

B. Prolongation of action potential duration and effective refractory period

C. Direct activation of potassium outward currents to shorten repolarization

D. Enhancement of sympathetic stimulation to increase sinus automaticity

29. Case: A patient with supraventricular tachyarrhythmia receives verapamil therapy. Which mechanism BEST explains the anti-arrhythmic action of verapamil?

A. Blockade of activated and inactivated L-type calcium channels with prolongation of nodal conduction

B. Selective activation of sodium channels within Purkinje fibers

C. Permanent suppression of ventricular depolarization through potassium channel activation

D. Direct enhancement of catecholamine release from sympathetic nerve terminals

30. Case: A patient with severe bradyarrhythmia following myocardial infarction is treated with atropine. Which effect BEST explains the therapeutic benefit of atropine?

A. Blockade of acetylcholine effects leading to increased sinus rate and enhanced AV nodal conduction

B. Direct inhibition of β■-adrenoceptors causing reduced automaticity

C. Suppression of sodium influx resulting in prolonged ventricular refractory periods

D. Complete inhibition of calcium channels within nodal tissue

Model Answers

1. B
2. C
3. B
4. C
5. B
6. C
7. B
8. B
9. C
10. B
11. B
12. A
13. B
14. B
15. B
16. B
17. B
18. C
19. B
20. A
21. C
22. B
23. A
24. C
25. A
26. B
27. B

28. B

29. A

30. A