



Cardiac Monitor Technician Study Guide

I. Anatomy of the Heart

- a. Layers
 - 1. pericardium
 - 2. epicardium
 - 3. myocardium
 - 4. endocardium
- b. Chambers
 - 1. atrial
 - 2. ventricular
- c. Valves
 - 1. semilunar
 - 2. atrioventricular

II. Coronary & Systemic Circulation

- a. blood flow through the
 - 1. heart
 - 2. body
 - 3. coronary arteries
- b. coronary blood flow to various zones of the myocardium

III. Cardiac Conduction System

- a. sinus node
- b. Bachman's bundles in the atria
- c. AV node
- d. bundle branches
 - 1. right
 - 2. left
 - a. left anterior division
 - b. left posterior division
- e. blood supply to conducting tissue

IV. Knowing the Graph Paper

- a. calculating heart rate by "Scan" and "Exact" methods
- b. measuring depth and amplitude of waveform representing a complete cardiac cycle from any given lead of the 12-lead ECG

V. Identify the Normal Components of the Cardiac Cycle

a. Relate the mechanical events going on in the heart to each of the components of the cardiac cycle listed below:

1. P
2. P-R
3. QRS
4. ST
5. T
6. U
7. QT

VI. Identify the Normal Morphology of Each the Following Components From Each Lead of a 12-lead ECG:

- a. P wave
- b. P-R interval
- c. QRS complex
- d. ST segment
- e. T wave
- f. U wave
- g. QT interval

VII. The 12-Lead ECG

- a. the standard leads: I, II, and III
- b. the augmented voltage leads (aV): aVR, aVL, aVF
- c. precordial leads

VIII. Using Bedside Monitoring Leads

- a. The Gold Standard for bedside monitoring
 1. leads V1 and V6 for arrhythmias
 2. leads V1 and lead 3 for inferior ischemia/injury
 3. lead V3 for anterior ischemia/injury and lead V1 or V6 for anticipated arrhythmias

IX. When to Call for a 12-lead ECG:

- a. narrow and wide-QRS tachycardias
- b. new onset arrhythmias
- c. signs or symptoms of coronary artery disease to rapidly identify:
 - 1. ACS
 - 2. STEMI
 - 3. NSTEMI
 - 4. unstable angina
 - 5. ischemia vs injury
- d. suspected electrolyte disturbances
- e. suspected pericardial disease
- f. suspected pulmonary embolus

X. Recognition of Recording Errors:

- a. incorrect lead placement
- d. reversal of limb leads or chest leads

XI. Recognition of Recording Artifacts:

- a. electrical interference
- b. somatic tremor
- c. wandering baseline

XII. Patient and Electrical Safety Hazards of Electrical Apparatus:

- a. common hazards (broken cords, plugs and sockets)
- b. subtle hazards (current leakage)
- c. ground connectors
- d. pacemaker hazards
- e. electrical shock

XIII. Identify the Following Electrocardiographic Diagnoses and Identify the Best Leads from the 12-lead to make the Diagnosis and Further Identify Which Leads the Patient Should be Placed in for Continuous Monitoring for Each Entity:

- a. sinus rhythms
 - 1. sinus rhythm
 - 2. sinus bradycardia
 - 3. sinus tachycardia
 - 4. sinus pause
 - 5. sinus arrest
 - 6. sick sinus syndrome (tachy-brady syndrome)
- b. atrial rhythms
 - 1. atrial premature beats
 - a. conducted normally
 - b. non-conducted
 - c. conducted with bundle branch block
 - 2. atrial tachycardia
 - a. 1:1 conduction
 - b. 2:1 conduction
 - c. varying conduction
 - d. with bundle branch block aberration
 - 3. atrial fibrillation
 - a. controlled rate
 - b. rapid
 - c. over controlled with block
 - d. with bundle branch block aberration
 - 4. atrial flutter
 - a. 1:1 conduction
 - b. 2:1 conduction
 - c. varying conduction
- c. Junctional rhythms
 - 1. junctional premature & escape beats
 - 2. junctional rhythm
 - 3. accelerated junctional rhythm
 - 4. junctional tachycardia
 - 5. junctional rhythms with bundle branch block

- d. Ventricular rhythms
 - 1. ventricular premature & escape beats or rhythm
 - a. negative-wide in V1
 - b. positive-wide in V1
 - c. positive or negative concordancy
 - d. fusion beats
 - e. capture beats
 - 2. accelerated idioventricular rhythm
 - 3. ventricular tachycardia
 - 4. Torsades de pointes
- e. Aberrant ventricular conduction
 - 1. bundle branch block aberration
 - a. right bundle branch block
 - b. left bundle branch block
 - c. incomplete bundle branch block
 - d. rate dependent bundle branch block
 - 2. hemiblock aberration
 - a. left anterior hemiblock
 - b. left posterior hemiblock
- f. Atrioventricular block (AV block)
 - 1. first degree AV block
 - 2. second degree AV block
 - a. type I (Wenckebach and Mobitz I)
 - b. type II (Mobitz II)
 - 3. high grade AV block
 - 4. third degree or complete AV block
- g. Troubleshoot cardiac pacemakers strips
 - 1. AAI atrial demand
 - 2. VVI ventricular demand
 - 3. DDD or dual chambered devices
 - 4. ICDs
- h. Pre-Excitation arrhythmias
 - a. Wolff-Parkinson-White Syndrome (WPW)
- i. ST segment and T wave abnormalities
 - 1. patterns suggestive of myocardial ischemia
 - 2. patterns suggestive of myocardial infarction
- j. Electrolyte disturbances
 - 1. hyperkalemia
 - 2. hypokalemia
 - 3. hypercalcemia
 - 4. hypocalcemia

- k. Identify the common myocardial mimics
 - 1. pericarditis
 - 2. pulmonary embolus
 - 3. hemiblock
 - 4. ventricular hypertrophy
 - 5. hypertension with and without ventricular hypertrophy

XIV: Placement of and Changing Electrodes

- a. check for electrode sensitivity
- b. change electrodes daily if not every other day
- c. changes associated with even an inch of misplacement
- d. skin preparation

XV: Infection Prevention

- a. hand washing before and after each patient
- b. no artificial fingernails
- c. careful cleaning of the telemetry wires and boxes
- d. careful cleaning of the ECG machine and wires between patients