EMT Cardiology Study Guide

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This study guide focuses on Cardiology for EMTs. It aligns with the NREMT EMT certification exam (updated format effective April 2025), National EMS Education Standards, National EMS Scope of Practice Model 2019 (with Change Notices), and current prehospital care principles. Cardiology is a critical domain on the NREMT EMT exam, covering patient assessment, basic cardiac emergencies, and appropriate interventions within the EMT scope of practice. EMT Scope in Cardiology: Recognition of chest pain, basic ECG rhythm identification (e.g., sinus, bradycardia, tachycardia, asystole, PEA), use of aspirin and nitroglycerin (if prescribed and protocols allow), assisting with advanced cardiac medications (e.g., epinephrine in cardiac arrest), CPR, AED use, and basic airway management. Key Principle: Early recognition, early CPR, early defibrillation (AED), and early advanced care transport are paramount in cardiac emergencies.

Disclaimer: This is a study aid, not official. For PDF, copy into a word processor and export. Always follow current local protocols, NREMT skill sheets, and the latest AHA 2025 BLS guidelines.

Section 1: Cardiac Anatomy & Physiology (EMT Focus)

Heart Chambers & Blood Flow:

Right atrium (deoxygenated blood from body) → Right ventricle → Pulmonary artery (lungs) → Pulmonary veins (oxygenated blood) → Left atrium → Left ventricle (aorta to body).

Electrical Conduction System:

SA Node (pacemaker, 60-100 bpm) → AV Node (40-60 bpm) → Bundle of His → Bundle Branches → Purkinje Fibers (20-40 bpm).

Section 2: Patient Assessment & History Taking (Cardiac)

Primary Assessment:

Identify immediate life threats (unresponsive, no breathing/agonal, no pulse → start CPR/AED).

General Impression: Apparent distress, pallor, diaphoresis. AVPU/GCS.

Airway: Open, maintain.

Breathing: Rate, rhythm, quality, lung sounds (rales/crackles for CHF).

Circulation: Pulse (rate, rhythm, quality), skin (color, temp, condition), capillary refill, obtain BP.

Secondary Assessment:

SAMPLE history (Signs/Symptoms, Allergies, Medications, Past medical history, Last oral intake, Events leading to).

OPQRST for chest pain (Onset, Provocation/Palliation, Quality, Radiation, Severity, Time).

Focused Physical Exam: Chest (inspect, palpate, auscultate), extremities (edema), neck (JVD).

Section 3: Cardiac Emergencies & Interventions (EMT Scope)

Acute Coronary Syndrome (ACS) / Chest Pain:

Signs/Symptoms: Chest pain (pressure, heaviness, tightness, crushing), radiating to arm/jaw/back, dyspnea, diaphoresis, nausea/vomiting, anxiety, pallor.

Interventions: Position of comfort, O&sub2; if hypoxic (SpO&sub2; <94%), aspirin (162-324 mg chewable, if no contraindications), assist with patient's prescribed nitroglycerin (max 3 doses, BP >100 mmHg systolic, no ED meds in last 24-48 hrs). Be prepared for cardiac arrest.

Cardiac Arrest:

Unresponsive, no breathing/agonal, no pulse.

Interventions: Activate EMS, immediate high-quality CPR (compressions 100-120/min, depth 2-2.4 in, full chest recoil, minimize interruptions), early defibrillation (AED). Attach AED pads immediately, follow prompts. Resume CPR immediately after shock/no shock advised. Continuously switch compressors every 2 minutes.

Congestive Heart Failure (CHF):

Signs/Symptoms: Dyspnea (especially orthopnea), crackles/rales (fluid in lungs), pedal edema, JVD, pink frothy sputum, anxiety.

Interventions: Position of comfort (sitting up), O&sub2; (NRB or CPAP if available and protocol allows), prepare for respiratory distress/arrest.

Stroke:

Signs/Symptoms: Sudden unilateral weakness/numbness, facial droop, slurred speech, vision changes, severe headache.

Interventions: Rapid transport, Cincinnati Prehospital Stroke Scale, maintain airway, O&sub2; if hypoxic.

Seizure:

Signs/Symptoms: Convulsions, altered LOC, postictal state.

Interventions: Protect patient from injury, maintain airway, O&sub2; if hypoxic, monitor vital signs.

Section 4: Basic ECG Rhythm Recognition (EMT)

Normal Sinus Rhythm: Rate 60-100 bpm, regular rhythm, P wave before every QRS.

Sinus Bradycardia: Rate <60 bpm, regular rhythm, P wave before every QRS.

Sinus Tachycardia: Rate >100 bpm, regular rhythm, P wave before every QRS.

Asystole: Flatline, no electrical activity. **Interventions:** Confirm in 2 leads, check pulse. If no pulse, CPR/AED, consider reversible causes.

Pulseless Electrical Activity (PEA): Organized electrical activity on monitor, but no palpable pulse. **Interventions:** CPR/AED, consider reversible causes (H's and T's).

Ventricular Fibrillation (VFib) / Pulseless Ventricular Tachycardia (PVT): Chaotic electrical activity (VFib) or rapid, wide QRS (PVT) with no pulse. **Interventions:** Immediate defibrillation (AED).

Section 5: Common EMT Pitfalls to Avoid

Delaying CPR or AED deployment.

Not recognizing signs of hypoperfusion (shock).

Giving aspirin/nitroglycerin when contraindicated (e.g., hypotension, recent ED meds).

Incorrect positioning of patient (e.g., supine for CHF).

Missing signs of altered mental status in cardiac patients.

Example Question:

An 85 y/o female complains of sudden onset shortness of breath, appears anxious, and has crackles heard bilaterally in her lungs. Her skin is pale and diaphoretic. Vital signs are BP 160/94, HR 110, RR 28, SpO&sub2; 88% on room air. Which of the following is the most appropriate initial intervention for this patient? A) Administer her prescribed nitroglycerin. B) Assist her into a supine position. C) Apply oxygen via non-rebreather mask and consider CPAP if protocol allows. D) Administer 324 mg of chewable aspirin. **Solution:** C) Apply oxygen via non-rebreather mask and consider CPAP if protocol allows.**Reasoning:** The patient exhibits classic signs of acute pulmonary edema likely secondary to CHF, including dyspnea, crackles, and hypoxia. Oxygen is immediately indicated to improve oxygenation. CPAP can help push fluid out of the alveoli and improve breathing without increasing preload. Nitroglycerin might be considered later, but oxygenation and ventilation support are primary. Aspirin is for suspected ACS. A supine position would worsen her dyspnea. Mastering EMT cardiology requires rapid assessment, early intervention for life threats, and strict adherence to protocol. Practice patient scenarios, understand medication contraindications, and continually review BLS algorithms. Good luck on your EMT certification—act fast, think clearly, and always prioritize the ABCs!