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Paramedic Medical Study Guide

2025-2026 Edition - ACLS / PALS / NREMT Paramedic Aligned
Advanced Assessment - Pharmacology - Differential Diagnosis - Critical Interventions

Medical Emergencies = ~30-35% of NREMT Paramedic exam content
Heavily tested in patient assessment, differential diagnosis, advanced interventions, pharmacology

Core Paramedic Medical Principle (2025-2026):
Most medical patients are **time-sensitive until proven otherwise**. Your job is to rapidly narrow the differential, treat reversible causes, stabilize physiology, and deliver to the right specialty center before decompensation.

Always ask:
• "What is the most likely life threat right now?"
• "What can I fix in the next 5-10 minutes?"
• "Where is definitive care, and how fast can I get there?"

Section 1: Medical Patient Assessment Framework (Advanced)

SAMPLE + OPQRST + Focused Exam

- **S**igns/Symptoms → Include onset, progression, associated symptoms
- **A**llergies → Meds (especially beta-blockers, ACE inhibitors, anticoagulants)
- **M**edications → Full list + compliance + recent changes
- **P**ast history → Surgeries, hospitalizations, recent procedures
- **L**ast oral intake → Relevant for sedation/RSI, contrast studies
- **E**vents → Precipitating factors, environment, witnesses

Vital Signs & Monitoring Mastery

- **Continuous waveform capnography ($EtCO_2$)** for all advanced airways & respiratory distress
- **12-lead ECG** on all cardiac/neurologic/AMS patients
- **SpO_2:** 94-98% target (88-92% in COPD exacerbation if chronic)
- **Blood glucose** on all AMS/seizure patients
- **Temperature** (hyper/hypothermia as reversible cause)

Section 2: High-Yield Medical Emergencies & Paramedic Interventions

Emergency	Key Signs/Symptoms & Red Flags	Paramedic Priority Interventions	Destination / Transport
ACS / STEMI	Chest pressure, radiation, diaphoresis, nausea; ST elevation on 12-lead	ASA 325 mg, P2Y12 inhibitor, heparin bolus, nitro IV infusion, fentanyl, 12-lead transmission	PCI-capable center (scene-to-balloon <90 min)
Pulmonary Edema / CHF	Pink frothy sputum, rales, JVD, SpO_2 <90%	CPAP/BiPAP 5-10 cmH_2O, nitro IV infusion, cautious morphine, furosemide	Cardiac/PCI center if cardiogenic shock
Severe Asthma / COPD	Silent chest, accessory muscles, hypercapnia, fatigue	Continuous albuterol + ipratropium neb, magnesium 2g IV, CPAP/BiPAP, ketamine for DSI	ED or ICU-capable; RSI if impending arrest
Anaphylaxis	Stridor, angioedema, hypotension, bronchospasm	Epinephrine 0.3-0.5 mg IM q5-15min, diphenhydramine 25-50 mg IV, methylprednisolone 125 mg IV, fluids	ED - monitor for biphasic reaction
Stroke / CVA	Sudden focal deficit (FAST/BE-FAST), last known normal <4.5-24h	Glucose check, high-flow O_2 if hypoxic, BP management (avoid aggressive lowering), rapid transport	Stroke center (thrombectomy-capable if LVO)
Status Epilepticus	Continuous/recurrent seizures >5 min	Midazolam 0.2 mg/kg IV/IM/IN (max 10 mg), second-line levetiracetam 20-60 mg/kg IV, RSI if airway	ED or neuro-ICU capable
DKA / HHS	Hyperglycemia (>250), Kussmaul respirations, dehydration, AMS	IV fluids NS 500-1000 mL bolus then 250-500 mL/h, check K+, transport	ED or ICU-capable; insulin only in hospital
Sepsis / Septic Shock	Suspected infection + ≥2 qSOFA (RR ≥22, AMS, SBP ≤100)	Fluids 30 mL/kg crystalloid, norepinephrine if refractory, antibiotics if protocol	Sepsis/ICU-capable center
Opioid Overdose	Respiratory depression, pinpoint pupils, AMS	Naloxone 0.4-2 mg IV/IN titrated, advanced airway if needed	ED - monitor for re-narcotization

❤ Section 3: Cardiac Emergencies - Beyond BLS

12-Lead ECG - Must-Recognize Patterns

- **STEMI:** ST elevation ≥1mm in 2+ contiguous leads
- **Wellens:** Biphasic or deeply inverted T waves V2-V3 (LAD warning)
- **De Winter:** Upsloping ST depression V1-V6 + tall T waves (LAD occlusion)
- **LBBB:** Use Sgarbossa criteria for STEMI
- **Right-sided MI:** Inferior STEMI → do V4R; avoid nitrates if positive

ACS Pharmacology

Medication	Dose	Notes
Aspirin	324 mg chewed	First drug; unless active bleed
Nitroglycerin	0.4 mg SL or 10-20 mcg/min IV	Hold if SBP <100 or RV infarct
Heparin	60 units/kg (max 4000 units)	Per protocol; for STEMI
Fentanyl	50-100 mcg IV titrated	Pain control; preferred over morphine
P2Y12 Inhibitor	Clopidogrel 600mg or Ticagrelor 180mg	Per protocol; cath lab preference

Section 4: Respiratory Emergencies

Condition	Assessment	Paramedic Treatment	Key Points
Asthma / Severe Bronchospasm	Wheezing, prolonged expiration, silent chest (severe)	Albuterol/ipratropium neb, magnesium 2g IV, epinephrine if severe	Mag sulfate for severe; epi IM if refractory
COPD Exacerbation	Pursed-lip, barrel chest, accessory muscles, chronic hypoxia	CPAP/BiPAP, bronchodilators, steroids, titrate O_2 to 88-92%	CPAP may prevent intubation
Pulmonary Embolism	Sudden dyspnea, pleuritic pain, tachycardia, DVT history	High-flow O_2, fluid bolus (cautious), anticoagulation (per protocol)	High mortality; needs hospital for tPA/thrombectomy
Tension Pneumothorax	Absent breath sounds, JVD, tracheal deviation, hypotension	Needle decompression (4th/5th ICS anterior axillary)	Decompress before intubation if suspected

CPAP/BiPAP Indications

- **CHF / Pulmonary Edema:** First-line for acute respiratory distress
- **COPD Exacerbation:** May prevent intubation
- **Contraindications:** Apnea, facial trauma, vomiting, GCS <10, unable to protect airway
- **Start:** CPAP 5-10 cm H_2O; BiPAP 10/5 typical

Section 5: Neurological Emergencies

Stroke - Time is Brain

- **FAST + LAMS/NIHSS:** Document severity for LVO detection
- **Last known well time:** Critical for tPA eligibility (4.5h window)
- **BGL:** Hypoglycemia mimics stroke
- **BP:** Do NOT treat unless >220/120 (or >185/110 if tPA candidate)
- **Transport:** Comprehensive stroke center if LVO suspected

Condition	Signs	Treatment
Status Epilepticus	Seizure >5 min or recurrent without recovery	Midazolam 10mg IM or Lorazepam 4mg IV, protect airway, glucose if low
Hypoglycemia	AMS, diaphoresis, tremors, seizure, BGL <60	D10 100-200 mL IV (preferred) or D50 25g IV, glucagon 1mg IM if no IV
Meningitis	Fever, headache, neck stiffness, photophobia, petechial rash	Supportive care, isolation, rapid transport, antibiotics in some protocols

Section 6: Pharmacology Quick Reference (Medical)

Medication	Dose & Route	Primary Medical Indication	Key Cautions / Side Effects
Aspirin	325 mg chewed	ACS / suspected cardiac event	Active bleeding, allergy
Nitroglycerin	10-20 mcg/min IV infusion, titrate	ACS, pulmonary edema	Hypotension; avoid in RV infarct
Epinephrine	0.3-0.5 mg IM (anaphylaxis) 2-10 mcg/min infusion (shock)	Anaphylaxis, refractory shock	Tachycardia, hypertension
Albuterol + Ipratropium	Continuous neb	Severe asthma/COPD exacerbation	Tachycardia, tremor
Magnesium Sulfate	2 g IV over 20 min	Severe asthma, torsades	Hypotension, flushing
Midazolam	0.1-0.2 mg/kg IV/IM/IN	Seizures, agitation, RSI induction	Respiratory depression
Fentanyl	50-100 mcg IV titrated	Pain control (ACS, trauma, post-arrest)	Respiratory depression, chest wall rigidity
Naloxone	0.4-2 mg IV/IN titrated	Opioid overdose	Precipitous withdrawal in chronic users
Diltiazem	0.25 mg/kg IV bolus → infusion	Rate control in stable AF/flutter	Hypotension, bradycardia
Norepinephrine	0.1-1 mcg/kg/min IV infusion	Septic/cardiogenic/neurogenic shock	Tissue necrosis if extravasation

Section 7: High-Yield Judgment Questions

Q1: 58 y/o male, crushing chest pain, 12-lead shows anterior STEMI, BP 142/88. First medications?

A: Aspirin 325 mg, P2Y12 inhibitor, heparin bolus, nitro IV infusion.

Q2: 45 y/o female, pulmonary edema, SpO_2 88% on RA, BP 180/110.

A: CPAP 5-10 cmH_2O, nitro IV infusion (preload/afterload reduction), rapid transport.

Q3: 32 y/o male, status epilepticus × 10 min, midazolam 10 mg IM given 5 min ago, still seizing.

A: Second benzo (lorazepam 0.1 mg/kg IV) → levetiracetam 20-60 mg/kg IV → RSI if airway compromise.

Q4: 70 y/o female, AMS, BGL 45 mg/dL, unconscious.

A: D10W 250 mL IV bolus (or D50 if protocol), reassess, transport.

Quick Medical Math Example

Question: 80 kg septic patient. Protocol: 30 mL/kg crystalloid bolus. How many mL total?

Solution: 30 mL/kg × 80 kg = **2,400 mL (2.4 L)**

Reasoning: Weight-based fluid resuscitation for sepsis.

Master Paramedic Medical Emergencies

Think in layers:
Airway/Oxygenation → Circulation/Shock → Reversible causes (glucose, toxins, infection) → Specialty center transport

Narrow the differential fast. Treat what you can see and measure. Get them to people who can do what you can't.

You're the bridge between the street and the ICU. Build it strong. Build it fast.

Stay sharp. Stay thorough. Stay lifesaving.