Paramedic Airway Management Study Guide

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This study guide covers airway management for paramedics, aligned with NREMT paramedic certification standards (National EMS Scope of Practice Model 2019 with updates), AHA BLS/ACLS 2025 Guidelines (current as of 2026), and national EMS education standards. Airway is a high-priority, high-frequency skill on the NREMT exam (approximately 20% of questions in Airway, Respiration & Ventilation category). Focus areas include assessment, basic adjuncts, advanced airways, ventilation strategies, monitoring (especially waveform capnography), and special considerations (e.g., trauma, pediatrics, cardiac arrest). Always follow local protocols, use BSI/PPE, and prioritize minimal interruptions during CPR. Key Principle (AHA 2025): Patent airway is priority #1. Avoid hypoventilation or hyperventilation. Use visible chest rise as guide for tidal volume in arrest. For trauma with suspected head/neck injury: Prefer jaw thrust + adjunct; if ineffective, use head tilt-chin lift to secure airway.

Section 1: Airway Anatomy & Physiology Review

Upper Airway: Nose/mouth → pharynx → larynx (protects lower airway; epiglottis, vocal cords).

Lower Airway: Trachea → bronchi → bronchioles → alveoli (gas exchange).

Adult vs. Pediatric Differences: Pediatric: Larger tongue relative to mouth, higher larynx (C3-C4 vs. C5-C6 in adults), narrower cricoid ring (cuff pressure risk in uncuffed ETT).

Minute Ventilation (MV): Tidal volume (Vt) × Respiratory rate (RR). Adequate MV requires proper Vt and RR.

Adequate vs. Inadequate Breathing: Adequate: Clear speech, normal rate/depth, SpO&sub2; ≥94%, equal chest rise. Inadequate: Respiratory distress/failure → cyanosis, accessory muscle use, altered mental status → requires intervention.

Section 2: Assessment & Indications for Intervention

Step	Assessment Findings Indicating Intervention
Look/Listen/Feel Airway patency, respiratory effort	Obstruction, gurgling, stridor, absent sounds
Rate & Depth RR 10-20 adult; Vt ~500-600 mL adult	<8 or >30 RR; shallow or absent chest rise
SpO&sub2; & EtCO&sub2; Pulse ox, capnography	SpO&sub2; <94% on RA; EtCO&sub2; abnormal waveform
Mental Status AVPU/GCS	Altered → protect airway
Special Trauma, overdose, anaphylaxis	Suspected c-spine injury, facial trauma

Indications for Positive Pressure Ventilation (PPV): Apnea, inadequate respiratory effort, GCS ≤8, severe hypoxia despite O&sub2;.

Section 3: Basic Airway Management Techniques

Technique	Indications	Steps	Key Notes (AHA/NREMT)
Manual Opening	All patients	Head tilt-chin lift (non-trauma); Jaw thrust (trauma/suspected c-spine)	2025 Update: In trauma, if jaw thrust + adjunct fails, use head tilt-chin lift for patent airway priority.
Oropharyngeal Airway (OPA)	Unconscious, no gag reflex	Measure corner of mouth to angle of jaw; Insert inverted, rotate 180°	Contraindicated if gag present; Causes obstruction if too small.
Nasopharyngeal Airway (NPA)	Conscious or semi-conscious	Measure tip of nose to earlobe; Lubricate, insert bevel toward septum	Contraindicated in severe facial trauma, suspected basilar skull fracture.
Suctioning	Secretions, vomitus, blood	Yankauer/rigid for oral; Soft catheter for ET tube	Max 10-15 sec; Pre-oxygenate; Monitor for hypoxia.

Oxygen Delivery Devices: Nasal cannula: 1-6 L/min (24-44%). Non-rebreather: 10-15 L/min (60-90%). High-flow nasal cannula: Up to 60 L/min (for select patients). Titrate to SpO&sub2; 94-98% (avoid hyperoxia in some cases).

Section 4: Ventilation Techniques

Method	Rate (Adult Arrest)	Tidal Volume	Notes
Bag-Valve-Mask (BVM)	10-12/min (1 every 5-6 sec)	Visible chest rise (~500-600 mL)	Two-person preferred; Avoid hyperventilation (causes decreased venous return).
With Advanced Airway	10/min continuous	Visible chest rise	No pauses for compressions in arrest.
CPAP/BiPAP	N/A (pressure support)	N/A	For respiratory distress (e.g., CHF, COPD); Contraindicated in vomiting/unprotected airway.

AHA 2025 Ventilation Updates: In arrest: Enough volume for visible chest rise; Avoid hypo- or hyperventilation. With advanced airway: 1 breath every 6 sec (10/min) continuous compressions.

Section 5: Advanced Airway Management (Paramedic Scope)

Per NREMT/National Scope: Paramedics perform endotracheal intubation (ETT) and supraglottic airways (e.g., King LT, i-gel, LMA).

Device	Indications	Insertion Steps	Confirmation	Complications
Endotracheal Intubation (ETT)	Definitive airway; Cardiac arrest, failure of basic methods	Pre-oxygenate; Sellick (if used); Blade insertion; Pass tube; Inflate cuff (20-30 cmH&sub2;O)	Waveform capnography (gold standard); Bilateral breath sounds; No epigastric sounds; Chest rise	Esophageal intubation; Right mainstem; Trauma; Vomiting/aspiration
Supraglottic Airway (SGA)	Alternative to ETT; Easier/faster in arrest	Blind insertion; Inflate cuffs; Ventilate	Capnography; Chest rise; Breath sounds	Inadequate seal; Aspiration risk higher than ETT

Device	Indications	Insertion Steps	Confirmation	Complications
Needle Cricothyrotomy	arrest Can't intubate/ventilate	Surgical or needle	N/A	Temporary bridge; High complication rate

Confirmation of Placement (Mandatory): Continuous waveform capnography (EtCO&sub2;): >0 mmHg and consistent waveform = tracheal placement. Auscultation, chest rise, absence of epigastric sounds. Secure device; Monitor for dislodgement. NREMT Skill Emphasis: Successful placement within attempts limit; No dangerous maneuvers; Confirm properly.

Section 6: Special Situations

Cardiac Arrest (AHA ACLS 2025): Start with BVM + OPA/NPA. Advanced airway if needed (supraglottic preferred if intubation difficult). Continuous compressions if advanced airway in place. Avoid routine advanced airway early if BVM effective.

Trauma: C-spine precautions; Jaw thrust first; If fails, head tilt-chin lift (2025 update).

Pediatrics: Padding under shoulders; Smaller equipment; Avoid over-ventilation.

Obstruction (FBAO): Abdominal thrusts (conscious); CPR + finger sweep (unconscious adult).

Post-Intubation Care: Secure tube; Continuous EtCO&sub2;; Reassess frequently.

Section 7: Common NREMT-Tested Scenarios & Tips

Apneic adult → Immediate BVM ventilation.

Unconscious overdose → OPA + ventilate if inadequate.

Trauma patient with poor jaw thrust → Head tilt-chin lift if airway priority.

Failed intubation → Supraglottic airway or cric.

Always: Pre-oxygenate, minimize attempts (≤3 for ETT), use backup plans.

Math Example (Ventilation Rate Calculation): In arrest with advanced airway: Ventilate at 10 breaths/min. How many seconds between breaths? Solution: 60 seconds ÷ 10 breaths = 6 seconds per breath. Reasoning: Divide 60 by desired rate for interval. Review NREMT skill sheets for exact steps (e.g., Ventilatory Management - Adult, Supraglottic Airway Device). Practice with manikins and capnography simulators. Good luck on your paramedic certification! Stay current with AHA 2025 highlights and NREMT updates.