Pediatric Airway

Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

YES → Supplemental oxygen
Goal Oxygen Saturation
92% - 98%
Exit to Appropriate Protocol(s)

NO

	Basic Maneuvers First -open airway chin lift / jaw thrust -nasal or oral airway -Bag-valve mask (BVM)
	Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***
	Consider AMS Protocol UP 4
	Respiratory Distress with a Tracheostomy Tube Protocol AR 10 ***if indicated***

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**
- **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Airway Obstructed → YES

	Airway Foreign Body Obstruction Procedure AP 13
A	Direct Laryngoscopy
P	Airway Cricothyrotomy Needle Procedure AP 20 **See Pearls Section**

NO

Breathing / Oxygenation Support needed → YES

	Supplemental Oxygen BVM Maintain Oxygen Saturation 92% - 98%
B	Airway BIAD Device Procedure AP 2 ***if indicated***
A	Oral / Tracheal Intubation Procedure AP 6/AP 7
P	Chest Decompression Procedure WTP 1 ***if indicated***
P	Consider Airway Drug Assisted Protocol AR 3 ***if available***
P	Post-intubation / BIAD Management Protocol AR 8 ***if indicated***

NO

Monitor /Reassess Supplemental Oxygen
if indicated

Exit to Appropriate Protocol(s)

Failed Airway:

Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful intubation attempts

and/ or
Anatomy inconsistent with continued attempts

and/ or
Three (3) unsuccessful attempts by most experienced Paramedic/ AEMT.

Exit to Pediatric Failed Airway Protocol AR 6

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Airway

Pearls

- **Capnography Monitoring (EtCO2):**
  - **Continuous Waveform and Pulse Oximetry are required for intubation verification and ongoing patient monitoring (Not validated and may prove impossible in the neonatal population - verification by two (2) other means is recommended in this population.)**
  - **Capnography verification and monitoring is required for BIAD verification and monitoring once available on scene.**

This protocol is for use in patients who FIT within a Pediatric Medication/Skill Resuscitation System Product.

- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of 92% - 98%, it is acceptable to continue with basic airway measures.**
- **Ventilation Rate:**
  - **30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 10 - 12 per minute. Maintain EtCO2 between 35 - 45 and avoid hyperventilation.**
- **Ketamine for airway intervention and/ or sedation purposes:**
  - **Ketamine may be used in pediatric patients (fit within a Pediatric Medication/Skill Resuscitation System product, ≤ 15 years of age, or ≤ 49 kg) with DIRECT ONLINE MEDICAL ORDER by the system MEDICAL DIRECTOR or ASSISTANT MEDICAL DIRECTOR only.**
- **KETAMINE:**
  - **Ketamine may be used with or without a paralytic agent in conjunction with either an OPA, NPA, BIAD or endotracheal tube. BIAD is preferred over endotracheal tube until hypoxia and/ or hypotension are corrected.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management. Once hypoxia and hypotension are corrected, use of a sedative and paralytic can proceed if indicated.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV/ IO should be established as soon as possible.**
  - **Ketamine may be used for sedation once a BIAD or endotracheal tube are established and confirmed.**
- **Intubation:**
  - **Attempt defined as laryngoscope blade passing the teeth or endotracheal tube passed into the nostril.**
  - **Use of a stylet is recommended in all pediatric intubations.**
  - **Endotracheal tube: Depth = 3 x the diameter of the ETT. Estimated Size = 16 + age (years) / 4. Term newborn = 3. 5 mm.**
  - **If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)**
- **NC EMS Airway Evaluation Form:**
  - **Fully complete and have receiving healthcare provider sign confirming BIAD or endotracheal tube placement.**
  - **Complete online in region specific *ReadyOp* and upload completed form.**
  - **Complete when Ketamine, Etomidate, Succinylcholine and/ or Rocuronium or used to facilitate use of a BIAD and/ or endotracheal intubation.** Paramedics/ AEMT should consider using a BIAD if endotracheal intubation is unsuccessful.
- Secure the endotracheal tube well and consider c-collar in pediatric patients (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **Airway Cricothyrotomy Percutaneous Needle Procedure:**
  - **Indicated as a lifesaving / last resort procedure in pediatric patients < 10 years of age.**
  - **Very little evidence to support it's use and safety.**
  - **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  - **≥ 10 years: Surgical cricothyrotomy or commercial kits based on agency preference recommended.**
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.