Post-intubation/ BIAD Management

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 1, 2, 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.

ETT or Blind Insertion Airway Device Successful

NO → Exit to Appropriate Adult or Pediatric Airway Protocol(s) 1 – 7

YES

Continue Airway Adjuncts
Maintain SpO2 ≥ 92%
Ventilate Age Appropriate breaths/ minute
May require faster rate
See Pearls

B
- Maintain EtCO2 35 – 45
- 12 Lead ECG Procedure ***as indicated***

IV or IO Access Protocol UP 6 (preferably 2 sites)

P
- Cardiac Monitor
- Transport Ventilator Procedure ***If available***

Mechanical Ventilation Adult Protocol AR 11 ***If available***

Awakening or Moving after Intubation / BIAD Placement

Evidence of Anxiety / Agitation

NO

YES

P

Ketamine 1.5 – 2.0 mg / kg IV / IO

Fentanyl 50 - 75 mcg IV / IO
Repeat every 5 minutes as needed
Maximum 300 mcg
Pediatric: 1 mcg / kg IV / IO / IN
May repeat **0.5 mcg / kg** every 5 minutes as needed
Maximum 2 mcg / kg

Or
Morphine 4 mg IV / IO
Repeat **2 mg** every 5 minutes as needed
Maximum 10 mg
Pediatric: 0.1 mg / kg IV / IO
May repeat **0.1 mg / kg** every 5 minutes as needed
Maximum single dose 5 mg
Maximum 10 mg

Midazolam 2 - 2.5 mg IV / IO
Repeat every 3 – 5 minutes as needed
Maximum 10 mg
Pediatric: 0.1 – 0.2 mg / kg IV / IO / IN

Consider paralytic if needed for patient movement
Rocuronium 0.6 mg/kg IV / IO
Use only when unresponsive to pain control
Not indicated in Pediatrics

Propofol
Interfacility Transfer Protocol / Policy
If available

See Pearls

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Post-intubation/ BIAD Management

Immediately following BIAD or ETT placement:

- The patient may experience various levels of stress, agitation, or combativeness. The most important initial aspect of immediate post-intubation/ BIAD management is to control pain.
- Agitation and combativeness is usually because of pain with a BIAD or ETT in the airway causing discomfort. Mechanical ventilation/ BVM/ positive pressure ventilation is painful.
- Immediately begin sedation with **Ketamine 2 mg/kg** or **Fentanyl 50 – 100 mcg or 1 – 2 mcg/kg IV / IO**.
- Ketamine and Fentanyl are equal choices for sedation and even if Ketamine is given to initially to facilitate airway management, it remains an appropriate sedation choice. **Ketamine 2 mg/kg over 1 – 2 minutes. You may repeat 0.5 mg/kg doses every 5 to 10 minutes as needed**.

Benzodiazepines:

- **Benzodiazepines are associated with worse patient outcomes and prolonged ICU stays. Opioid(s) and/ or Ketamine is the best first choice.**

  Persistent inadequate sedation:

  Midazolam may be given if repeat doses of opioids and/ or **Ketamine** are ineffective or inadequate**. (≥3 doses)**

Hypotension:

- Persistent hypotension should not prevent you from providing appropriate sedation and pain control. Fluid resuscitation should be initiated. Push-dose vasopressors can be started simultaneously and pain medication can be given, such as **Fentanyl 50 – 75 mcg or 1 mcg/kg IV / IO.**
- **Ketamine** is also appropriate to use with hypotension as a sedative, which also has pain relieving properties and like **Fentanyl** does not provoke hypotension to the extent of other sedative medications.

ROCURONIUM MAY BE USED ONLY AS A LAST RESORT.

- If utilized, make every effort to ensure the patient has adequate pain control. A patient should never be paralyzed without adequate sedation and pain control. Using a paralytic should be rare event.

Positioning:

- Proper patient positioning is paramount. Raise the head of the bead 10 to 30° depending on underlying condition. This helps prevent aspiration.

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Patients requiring advanced airways and ventilation commonly experience pain and anxiety.**
- **Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.**
- **Ventilated patients cannot communicate pain/ anxiety and providers are poor at recognizing pain/ anxiety.**
- **Vital signs such has tachycardia and/ or hypertension can provide clues to inadequate sedation, however they are not always reliable indicators of a patient's lack of adequate sedation.**
- **Sedation strategy:**

  Pain is the primary reason patients experience agitation and must be addressed first.
  Opioids and/ or Ketamine are the first line agents, alone or in combination.
  Benzodiazepines may be utilized if patient is not responding to adequate opioid and/ or Ketamine doses.
  Paralysis is considered a last resort, only when patients are not responding to opioid, Ketamine, or benzodiazepines.
  Patients that have received paralytics may be experiencing pain with no obvious signs or symptoms.
  Consider sedation early after giving paralytics, especially in patients receiving Rocuronium.
- **Ventilation rate:**

  Guidelines: 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.
- **Ventilator/ Ventilation strategies will need to be tailored to individual patient presentations. Medical director can indicate different strategies above.**
- **Propofol:**

  Use restricted to agencies approved by the OEMS State Medical Director.
  Agencies must submit a use policy and education plan to the OEMS.
  Infusion must be supplied and initiated by a medical facility and may be used only during interfacility transfer.
  Paramedic may titrate infusion to maintain appropriate sedation but cannot initiate or bolus the medication.
- In general, ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 - 8 mL/kg and peak pressures should be < 30 cmH_20. Plateau Pressures should be < 30 cmH_20.
- Head of bed should be maintained at least 10 – 20 degrees of elevation when possible, to decrease aspiration risk.
- With abrupt clinical deterioration, if mechanically ventilated, disconnect from ventilator to assess lung compliance.
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.