Contents lists available at www.innovativejournal.in

INTERNATIONAL JOURNAL OF NURSING DIDACTICS

homepage: http://innovativejournal.in/ijnd/index.php/ijnd

IJND ISSN: 2231-5454

Medication Assisted Intubation (M.A.I.)

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DOI: http://dx.doi.org/10.15520/ijnd.2015.vol5.iss05.46.23-25

Also known as ***Rapid Sequence Intubation (RSI), Crash Airway Procedures (CAP) ,***and other names, is the use of medications to assist in intubation is both life saving and risky. Rapid sequence intubation (RSI) is an airway management technique that produces inducing immediate unresponsiveness (induction agent) and muscular relaxation (neuromuscular blocking agent) and is the fastest and most effective means of controlling the emergency airway.

RSI is useful if the following are present:

a. Dynamically deteriorating clinical situation, i.e., there is a real “need for speed”
b. Non-cooperative patient
c. Respiratory and ventilatory compromise
d. Impaired oxygenation
e. Full stomach (increased risk of regurgitation, vomiting, aspiration)
f. Extremely short safe apnea times
g. Secretions, blood, vomitus, and distorted anatomy

PROCEDURE

The basic procedures of rapid sequence intubation can be remembered by the "9’ Ps":

1. Prepare:	Equipment, meds, team, patient (basic airway management, positioning)
2. Preoxygenate:	100% O_2, 3 to 5 minutes
3. Premedicate:	**Atropine (0.02 mg/kg IV; peds** minimum 0.1 mg in children <8years) **Lidocaine 1.5 mg/kg IV** (head injury, asthma)
4. Push the sedative:	**Use one:** **Etomidate 0.3 mg/kg IV:** Use with caution in septic shock. Consider alternative sedation or supplemental corticosteroids **Midazolam 0.1 mg/kg IV** (adults) **PEDS**: 0.3 mg/kg IV: Suggested maximum single dose 10 mg; reduce dose or consider alternative in hypotension or elderly **Ketamine 1 to 2 mg/kg IV** (bronchodilator) Raises intracranial pressure; avoid in head injury.
5. Paralyze:	**Use one:** **Succinylcholine 2 mg/kg IV** Avoid in hyperkalemia, neuromuscular disease, or ocular trauma **Vecuronium 0.1 mg/kg IV OR Rocuronium 1 mg/kg IV Wait for relaxation (45-60 sec). Do not bag unless hypoxic.**
6. Position airway:	Head/neck position; laryngeal manipulation, BURP, cricoid pressure as needed
7. Pass the tube:	Maintain in-line cervical immobilization in head/neck trauma
8. Patent airway assessment:	Use esophageal intubation detector, check breath sounds, CO_2 detector
9. Post-intubation plan:	Drugs and dosages depend on medications used during intubation **Sedation: Midazolam 0.05 to 0.3 mg/kg IV**. Suggested maximum single dose 10 mg; reduce

dose or consider alternative in hypotension or elderly
Paralysis: Vecuronium 0.1 mg/kg IV (if not used for intubation)
Analgesia: Fentanyl 1 to 2 MICROgrams/kg IV
Morphine 0.05 to 0.15 mg/kg IV
Consider need for seizure prevention.

MEDICATIONS USED IN RSI

A) Sedative Hypnotics: To be used before depolarizing agents as an induction agent.
-***Etomidate (Amidate):*** for adults and children greater than 2 years of age, IV, IO: 0.3 mg/kg

B) Depolarizing Neuro-muscular Blocking Agents: To be used after Etomidate and/or Benzodiazepines.
- ***Succinylcholine Chloride (Anectine):*** IV, and IO: 1-2 mg/kg, Repeat 1 time only.
1-2 mg/kg for children, 2 mg/kg for infants,

C) Non Depolarizing Neuro-muscular Blocking Agents: These are long acting paralytics to be used only after the ET is secured.
- ***Vecuronium (Norcuron):*** To be used only with estimated intubation times greater than 15-20 minutes, on medical control order. Adults and Peds: IV/IO 0.1mg/kg repeated PRN.

D) Benzodiazepines (BZD): -***Midazolam (Versed)*** IV, IO, IM: 0.5-5 mg, Max of 10mg
PEDS: 0.1-0.2 mg/kg IV/IO to a max of 5 mg/dose. Max of 10 mg
- ***Diazepam (Valium):*** IV, IM, and IO: 5-10 mg.
PEDS: IV/IO: 0.2-0.3 mg/kg IV/IO PRN. Max of 20 mg.

E) Opiates: Cautionary use with hypotension
-***Morphine Sulfate (MS)*** IV, IO, IM: 2-5 mg, repeat up to 20 mg as needed.
PEDS: IV/IM/IO: 0.2-0.3 mg/kg, repeated PRN every 5-10 min.
-***Fentanyl, (Sublimaze)*** IV, IO, IM: 25-50 mcg. Max of 200 mcg.
PEDS: 2-5 mcg/kg. Max of 100 mcg

F) Other medications used in specific situations:
-***Lidocaine*** (for suspected increased ICP, CVA, etc.) IV, IO: 1 mg/kg
-***Atropine*** for children: IV, IO: 0.02 mg/kg. Minimum dose of 0.1 mg

RESCUE AIRWAYS MAY BE NEEDED WHEN RSI FAILS

The worst-case scenario being a **"Can't Intubate, Can't Ventilate" (CICV) situation**. While there are many procedures endorsed among the medical professionals, common actions include:

Method	Typical Application
Combitube	Upper airway anatomy relatively intact Blind insertion The patient is obtunded Failed RSI—follow with sedation/analgesia Two sizes available: Combitube SA 37F (4 to 5 ½ feet) Combitube 41F (5 feet and taller)
Laryngeal Mask Airway	Upper airway anatomy relatively intact
Transtracheal Needle	Severe laryngeal edema as in acute epiglottitis or severe allergic reaction with airway obstruction
Cricothyrotomy	Use if failure of other methods . **PEDS**: The patient is older than about 8years May be first choice in facial trauma
Tracheotomy	Laryngeal trauma with obstruction. PEDS: Failure of other methods in children less than 8 years

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