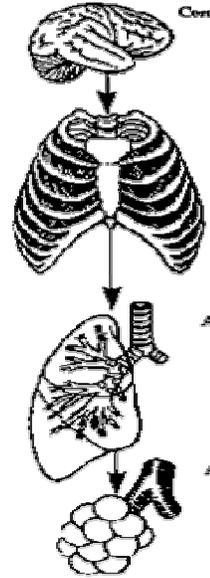


Preparation for Intubation

Reasons for intubation:

Head trauma / CNS
Weakness
Sedation
ICP?

Airway edema/ protection
Respiratory Failure
Arrest
Cardiogenic Shock
Sepsis



Preparation:

Yourself:

Evaluate Airway

AMPLE History

Check Equipment
(ET tube +/- sizes)

Patient:

100% O₂ X 5 min
(denitrogenate)

Positioned Airway
(near HOB)

Informed Consent?

Working IV

Room / Nurses:

Monitors on with BP q5

Suction/ Ambu bag

RT Called

Draw up drugs

Scenarios	Drugs: Induction	Drugs: Blockade	Adjuncts <i>Pretreat</i>	Special concerns
Head trauma	Pentothal 3-5mg/kg	Succinylcholine 1.5 –2 mg/kg	Atropine.02mg/kg min 0.1mg Lidocaine 1-1.5 mg/kg	Assume full stomach (RSI), use cricoid pressure, no BVM if possible
Status Asthmaticus	Ketamine 2mg/kg Consider Versed 0.1mg/kg to avoid emergence phenomemon	Vecuronium 0.1mg/kg (↑ dose for faster response)	Glycopyrrolate (antisialogogue) .004 -.01 mg/kg Lidocaine1-1.5 mg/kg	Full stomach? (Cricoid), BVM before blockade
Respiratory Failure	Versed 0.1-0.2 mg/kg and Fentanyl 2-5 mcg/kg	Vecuronium 0.1mg/kg		BVM before blockade
Cardiogenic Shock	Etomidate 0.1 -0.3 mg/kg or Fentanyl or small doses of the others	Vecuronium 0.1mg/kg	Consider Ketamine as alternative	Beware of worsening shock with induction BVM before blockade
Other	Propofol 1- 2mg/kg	Rocuronium 0.5 – 1.0 mg/kg (faster)	Atropine 0.02mg/kg min 0.1mg for young infants	Full stomach? (cricoid),BVM before blockade

ENDOTRACHEAL INTUBATION

I. **Purpose:** To establish access to the airway for assisted ventilation and emergency resuscitation

II. Equipment

1. Laryngoscope with blade size appropriate to the patient:
Ex. Neonates
Term (Greater than 3500 Gm) Miller (straight) 1
Premature (Less than 3500 Gm) Miller 0
Older Patients: Miller 1,2,3 or Mac 1,2,3
2. Endotracheal Tube of size appropriate:
Newborn <1500 grams 3.0
>1500 grams 3.5
Age in years +16 (equals size of ETT)

4

*All children under 8 years of age should have an uncuffed ETT

Note: The operator should have available tube sizes one size smaller and one size larger than the estimated size. It is probably safer to use a tube too small than one that is too big. Trauma and tissue ischemia are less likely to occur with a smaller tube. Have NG tube, oral, and ET suction catheters and BVM of the appropriate size available for all intubations.

3. Place the Stylet in endotracheal tube for **ALL** urgent and emergent intubations. The small stylet is used for all tubes 5.0 and smaller and the adult stylet for all tubes 5.5 and larger. Bend the stylet at the top of the ETT so that it will not slip down and out the end of the ETT.
4. You may proceed **after** checking that BVM is attached to an O₂ source turned up to 10L/min, **after** checking that suction is working; and checking that all intubation equipment is working properly. This includes a functioning IV.

III. Procedure

1. Place patient on a cardiorespiratory monitor with alarms set, pulse oximeter and non-invasive BP device. Obtain baseline vital signs and continue to monitor every 2 - 3 minutes through out the procedure.
2. Place patient in the supine position, neck straight and slightly extended. For a smaller infant a roll may be necessary under the shoulders to maintain an open airway during neck extension.
3. Hyperoxygenate/Denitrogenate. If necessary utilize BVM with 100% FiO₂.
4. Emergency intubation (Modified Rapid Sequence) is to be used in the following patients: Agitated, At risk for increased ICP, Head Trauma, Status Epilepticus, Inability to visualize the airway structures or full stomach. (Remember! Routine NPO guidelines i.e. >6 hours s/p solids pertains to an unstressed state. When in doubt assume a full stomach!)
5. Atropine 0.02mg/kg with a minimum dose of 0.1mg IV for all infants or if succinylcholine is used. Needs to be given 3-5 minutes ahead of planned sedatives.
6. Induction/Neuromuscular blockade:

See table on the previous page. Prepare syringes of each medication to be given ahead of time.

7. Apply cricoid pressure once any sedative is given.
8. Perform direct laryngoscopy. If visualization of the glottis is difficult, posterior displacement of the larynx with external pressure applied at the thyroid cartilage may be of value. Secretions of the glottis and posterior pharynx should be removed with the end of a Yankauer suction catheter at this time.
9. Insert the endotracheal tube, containing a pliable stylet, between the vocal cords and advance it a short distance into the trachea until the black mark disappears or insert cuff 1-2 cm past the vocal cords.
10. With the tube held securely, remove the laryngoscope then the stylet.
11. Begin manual ventilations with the ambu bag attached to the endotracheal tube.
12. Cricoid pressure should continue until endotracheal tube placement is confirmed.
13. If intubation is unsuccessful after an attempt lasting 30 seconds, remove the laryngoscope and BMV ventilate the child until stable before attempting again.
14. Once the tube is in the trachea, air exchange is evaluated. If the tube is properly placed, insufflation with the BVM device will result in equal and symmetrical chest wall excursion. If the ventilation is adequate, subjective improvement in the patient's color may be observed. Improper placement of the tube is indicated by unequal breath sounds, unequal or poor chest wall excursions, distention of the abdomen with air or escape of air into the pharynx.
15. Endotracheal tube placement should be confirmed by the use of an end-tidal CO₂ detector device.
16. If the tube has been advanced too far into the trachea, selective ventilation of one lung may result. In this situation, the tube should be gradually withdrawn until both lungs appear to be ventilated. (**Intubation lip depth should approximate:** 2 months- 11cm, 6 months- 12cm, 1 year- 13cm, 3 year- 14cm, 5 year- 15cm, 9 year- 18cm, 11 year- 19cm, 12 year- 20cm, 14 year- 22cm, 16 year- 22cm, adult- 22cm). An easy way to remember is 3X the size of the tube.
17. After proper placement has been assured by physical exam, tape the tube securely to the patient's face. Cloth tape and benzoin should be utilized.
18. NG tube placement should be performed now or emergently if gastric decompression is required to allow for effective ventilation.
19. After securing both tubes in place, a chest x-ray should be taken to document tube placement. The chest X-ray should demonstrate the ET tube tip halfway between the carina and the clavicle.

Complications of Endotracheal Intubation:

Watch for extremely loose teeth that may be dislodged during urgent intubation!
Inability to obtain airway, Laceration of gums, lips, vocal cords, and pharynx, Broken teeth, Vocal cord paralysis, Esophageal intubation, Pneumothorax, pneumomediastinum, Tracheal stenosis, Cardiovascular depression (hypotension and or bradycardia), Dislodgement of ETT during transport

RAPID SEQUENCE INTUBATION

I. Purpose:

To perform intubation in patients with a full stomach
To facilitate intubation and airway visualization in agitated patients
To prevent increased ICP during intubation especially in diseases associated with increased ICP and head trauma
To facilitate intubation during status epilepticus
To prevent vomiting and aspiration during intubation

II. Contraindications:

Upper airway obstruction, Myasthenia Gravis, Unsuccessful BVM ventilation
Major facial or laryngeal trauma, distortion of the airway anatomy
Sedation may be contraindicated in shock, and comatose patients

Drug Notes:

Most induction packages (**Pentothal, Versed+ Fentanyl, Propofol**) can cause significant hypotension. **Etomidate** has minimal hemodynamic effects.

Succinylcholine is contraindicated in myopathy, MH, after burns and crush injuries, and can cause significant rise in serum potassium. Should be used only when rapid sequence intubation is imperative

Atropine/Glycopyrrolate should proceed **Succinylcholine** and **Ketamine** respectively by 3-5 minutes if possible for their benefits to be effective.

Lidocaine IV ahead of laryngoscopy may reduce airway reflexes of coughing and gagging, and even bronchospasm

Ketamine is a bronchodilator, usually raises BP unless patient is in extremis and preserves respiratory drive more than **Versed and Fentanyl**

All non depolarizing muscular blockade agents (**Vecuronium** and **Rocuronium**) work faster at higher doses however they persist longer (You may have to bag the patient a long, long time if intubation is unsuccessful.