Airway Management in the Emergency Department

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Objectives

- Discuss goals of airway management with rapid sequence intubation vs tracheal intubation
- Review implementation and maintenance of airway and the nurses role
- Understand the sequence and equipment used for intubation
Emergency Environment

- Quick pace
- Immediate response area
  - Little time for pondering
  - Reactive environment requiring impeccable critical thinking skills
Indications for Intubation

- First step in resuscitation is the verification or establishment of a patent and protected airway
- Emergent defibrillation is the sole exception to this principle
- Without adequate oxygenation, all other potentially life-saving maneuvers will fail
A Clear Picture

▪ Some intubation needs are clear
  ▪ The comatose head injured patient
  ▪ The patient in respiratory failure who is tiring
  ▪ The burn victim.....

▪ Some are crystal clear that they should not be intubated
  ▪ The patient who presents with respiratory distress who is improving with medication and positive pressure
  ▪ The patient with allergic reaction who is improving with steroids....
Three Questions....

- Is there failure of airway maintenance or protection?
- Is there failure of oxygenation or ventilation?
- Is there an anticipated need for intubation (ie, what is the expected clinical course)?
Is there failure of maintenance or protection?

- The patient phonates clearly and answers questions appropriately
  - Demonstrates airway patency, adequate ventilation, vocal cord function and cerebral perfusion with oxygenated blood
  - Loss of protective airway reflexes mandates tracheal intubation
    - Level of alertness to maintain airway tone is the same required to prevent aspiration of oral and gastric secretions
Is There Failure of Oxygenation or Ventilation?

- Clinicians assess the patient's oxygenation using clinical criteria and oxygen saturation measurements.
- Clinically, hypoxic patients act restless and agitated, and with severe hypoxemia can appear cyanotic.
- As hypoxia worsens, confusion, somnolence, and obtundation occur.
- Blood gases and sats are unreliable. The clinical condition/presentation should contribute to the decision.
Is there an anticipated need for intubation?

- Loss of airway protection?
- Glasgow Coma Scale less than 8?
- Impending exhaustion?
Medications for RSI

- Emergent airway management involves a series of steps that must be performed in a specific sequence and at the correct times.

- Etomidate 0.3 mg/kg IV push effect 3-12 minutes
  - Adrenal suppression, myoclonus, and regional cerebral excitation

- Midazolam induction dose 0.1 to 0.3 mg/kg with time to effect of approximately 30 – 60 seconds and may be used as an infusion.
Induction Medications for RSI

- Propofol induction dose of 1.5 to 3 mg/kg with effect 15 to 45 seconds
  - No analgesic effects but may be used as an infusion
Duration of Airway Management

- Assess duration of intubation
  - Some methods of intubation less advantageous

- Permanent support
  - Underlying advanced lung or neuromuscular disease
    - Airway protection
      - Due to depressed mental status
      - Reversible upper airway pathology
      - Patient centered needs
Significant Comorbidities

- Aspiration potential
- Increased respiratory secretions
- Hemodynamic conditions – Cardiac/Sepsis
- Renal or liver failure
Assessment

History
- Previous Intubation
- Difficult/routine
- Congenital syndromes
  - Down’s syndrome Atlanto-Axial instability
  - Nasal polyps
  - Neck and TMJ problems,
  - Loose teeth
- Recent dental work
Examination

- **Facial hair**

- **Teeth**
  - Protruding/long incisors
  - Prominent overbite
  - Mouth opening
    - 3-4 cm
  - High arched narrow palate
  - Mandibular protrusion
  - Neck mobility and masses
  - Thyromental distance
    - Greater than 6 cm is normal

- **Thyromental distance**
  - Greater than 6 cm is normal
Examination

Review general body habitus

- Pregnant: breast size, mucosal vascularity changes
- Congenital Syndromes: Downs, Goldenhaar, Peirre-Robin, Achondroplasia
- Oral/Facial trauma – C-Spine immobility
Examination

- Nose – polyps, deviated septum, hypervascularity
- Mouth – Restricted opening, restricted laryngoscope passage
- Teeth – Protuberant incisors, unstable dentition (obstruction)
- Tongue - Macroglossia
- Jaw/TMJ – Small jaw, TMJ surgery restricting opening
- Neck – Bullneck, previous tracheostomy, ankylosing spondylitis, rheumatoid arthritis
Inspection

- Complete a Mallampatti Score to determine difficulty for intubation
- Score ranges from 1 for no anticipated difficulty to 4 for most difficult
- Class 1-all structures are seen
- Class 4- only hard palate is seen
Intubation Difficulty Scales

- Multiple airway risk assessment scales
  - Simplified Airway Risk Index
    - Seven parameters is used to calculate the SARI score: Mouth opening, Thyromental distance, Mallampatti Score, movement of the neck, the ability to create an under bite, body weight and previously intubation history
  - Modified Cormack Lehane
    - Done with direct visualization via laryngoscopy
## Modified Cormack-Lehane System

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Approximate frequency</th>
<th>Likelihood of difficult intubation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Full view of glottis</td>
<td>68%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>2a</td>
<td>Partial view of glottis</td>
<td>24%</td>
<td>4.3%</td>
</tr>
<tr>
<td>2b</td>
<td>Only posterior extremity of glottis seen or only arytenoid cartilages</td>
<td>6.5%</td>
<td>67.4%</td>
</tr>
<tr>
<td>3</td>
<td>Only epiglottis seen, none of glottis seen</td>
<td>1.2%</td>
<td>87.5%</td>
</tr>
<tr>
<td>4</td>
<td>Neither glottis nor epiglottis seen</td>
<td>very rare</td>
<td>very likely</td>
</tr>
</tbody>
</table>
Preparation

- Prep patient, drugs, position
- End tidal CO2
- Mask (and bag connected to source)
- Adjuncts (LMA)
- Introducer
- Laryngoscope
- Suction (turned on and at head of bed)
Types of Airways

- Nasopharyngeal airway
Types of Airways

- Oropharyngeal Airway

Figure 32: Oral Airway Insertion

1. Proper measurement for oral airway insertion
2. Proper oral airway placement
Nasotracheal Intubation

- Indications
  - Oral Surgery
  - Faciomaxillary surgery
  - If mouth need to be closed after surgery
  - Closed mouth
  - Difficult oral intubation
  - Prolonged mechanical ventilation in ICU
Laryngoscopes
Glidescope

- Designed for 1\textsuperscript{st} pass success
- Clear view of the airway
- Snapshot and video recording to a USB for confirmation
Endotracheal Tubes

General features:
• Made of PVC with low-pressure high-volume cuffs
• Sizes from 2.5 to 9.0 mm (internal diameter)
• Radio-opaque incorporated to aid placement
• Distal end is beveled
Rapid Sequence Induction vs. Tracheal Intubation

Rapid sequence induction/rapid sequence intubation (RSI)
- Advanced airway management medical procedure used to achieve tracheal **intubation** under general anesthesia in patients who are at high risk of pulmonary aspiration

**Tracheal intubation**
- Usually referred to as **intubation**, is the placement of a flexible plastic tube into the **trachea** to maintain an open airway or to serve as a conduit through which to administer certain drugs
Seems the Same?

- RSI is the preferred method in the Emergency Department
  - Rapidly acting sedative
  - Rapidly acting neuromuscular blocking agent
  - Enables rapid control
  - Presupposes the patient is at risk for aspiration of stomach contents and incorporates medications and techniques to minimize this risk.
- Use of RSI also helps to mitigate the potential adverse effects of airway manipulation.
RSI versus Tracheal Intubation

**Indications** — RSI is the standard of care in emergency airway management for intubations not anticipated to be difficult

**Contraindications** — Contraindications to RSI are relative. Circumstances exist where neuromuscular blockade is undesirable due to the high likelihood of intubation or mechanical ventilation failure. Depending on clinical circumstances, particular sedative or neuromuscular blocking agents may be relatively contraindicated, due to the risk of potential side effects.
Needs intubation

Unresponsive? Near death?
Yes → "The crash airway algorithm©"
No

Predict difficult airway?
Yes → "The difficult airway algorithm©"
No → RSI

Attempt intubation
Successful?
Yes → Post-intubation management
No

Failure to maintain oxygenation?
Yes → "The failed airway algorithm©"
No

≥3 attempts by experienced operator?
Yes
No
Conclusion

- RSI is the preferred method of intubation in the Emergency Environment
- The nurse is a critical part of this process
- Caution is not always the right choice when it comes to airway protection

Thank you!