Tracheal Aspiration

• ...is the use of ____________ to facilitate the removal of secretions from the respiratory tract.

• Under normal circumstances, patients with normal coughing do not have difficulty in removing secretions.

Tracheal Aspiration

• Indications
  – CNS depression
  – Placement of ____________
  – Debilitating diseases
  – Pain
  – Anything that decreases the patient’s ability to
  – When there is a overwhelming amount of secretions, even when patient can cough
To Promote Cough

• Ask patient
  • Spontaneous
  • Ambu bag, mask
  • IPPB
  • 5% CO₂

To Promote Cough

• Insert sterile ______________ into trachea
• Instill sterile ______________ into trachea
  through suction catheter, ETT
• Suprasternal notch pressure

Orotracheal Suctioning

• Best done sitting up 45°
• Difficult to hit trachea
• Causes gagging, vomiting
Nasotracheal Suctioning

- Better
- Easier to hit trachea
- Does not cause gagging, etc.

Suction Equipment

- Suction source
  - Portable or piped-in wall outlet
- Suction setting
  - "Intermittent" or "Continuous"
- Collecting bottle
- One-way valve
- Connecting tube

Safe suction ranges

- Adult: _______ to _______ mmHg
- Pediatric: -60 to -80 mmHg
- Neonatal: -40 to -60 mmHg
Suction Equipment

• One-way valve
  – ________ valve
  – ________ valve
• Collection jar
  – Glass or plastic
  – Marked in ml to measure
  – Special containers for sterile samples

Suction Equipment

• Catheters should not take up more than 50% of airway
  – Sizes 6-18 Fr. (Fr. = O.D. x 3)
Suction Equipment

• Catheters are designed as ___________
• Procedure should be sterile
  – sterile catheter
  – 2 gloves
• Catheters should have thumb port

Suction Equipment

• Distal end of catheter is designed to reduce trauma to mucosa
  – standard or “whistle tip”
  – ring tip
  – Coudé tip
Suction Equipment
Catheter tips

Suction Procedure
• Suctioning Simulation
  – Nasotracheal suctioning
  – Artificial airway (ETT) suctioning
  – Closed system suctioning

Suction Procedure
• Tracheal aspiration is not a __________ procedure and should be performed on a PRN or as needed basis only
• Tracheal aspiration is just that - tracheal
• As with any patient procedure, a good ________________ is first
Suction Procedure

- Patient cooperation depends on it

- Airway straight and open
  - Semi-Fowler’s is best (head up at least 45°)

Suction Procedure

- Preoxygenation/hyperinflation
  - Increase
    - If patient is on O₂, ↑ liter flow
    - If patient is not on O₂, it would be best to set it up
  - Encourage/assist patient with 5-10 deep breaths

Suction Procedure

- Catheter insertion
  - Slow, gentle motion
  - Use sterile water-soluble lubricant (e.g., K-Y)
  - NEVER force advancement - can cause mucosal damage
  - DO NOT apply suction on insertion
Suction Procedure

• Catheter insertion
  – advance catheter as far as possible, then withdraw slightly
  – if suctioning through an artificial airway, catheter external diameter should be no more than \( \frac{1}{2} \) the internal diameter of the airway

Suction Procedure

• Applying suction
  – suction should be applied only during __________ of catheter
  – suction should be intermittent, never continuous
  – __________ catheter 180° between fingers during withdrawal

Suction Procedure

• Applying suction
  – suction should be applied for no more than __________ seconds
  – total procedure time, insertion to complete withdrawal, should take no more than 20 seconds
Suction Procedure

- Applying suction
  - stop procedure if dysrhythmias occur (indicates possible _____________ stimulation or hypoxia)
  - ventilate as necessary with 100% O₂ until vital signs and cardiac rhythm return to normal

Suction Procedure

- Reoxygenation/hyperinflation
  - patient should receive O₂ and be encouraged/assisted with deep breathing following procedure
  - monitor cardiac _________________ and _________________ until pre-procedure status returns

Suction Procedure

- Repetition
  - procedure may be repeated as necessary
  - repeat all steps each time
Suction Procedure

• Documentation
  – record __________, _________________ and viscosity of removed secretions
  – record any problems or adverse effects

Therapeutic Considerations

• Use largest catheter possible that meets size requirements/limitations
• If possible, suction __________ the cuff of artificial airways first
• DO NOT ________ disposable catheters
• Properly discard all disposable items

Therapeutic Considerations

• DO NOT apply suction during ________
• Be aware that your patient may have a deviated septum or obstructed nasal passages
• Be prepared for gagging, retching or vomiting as catheter is passed into the pharynx
Therapeutic Considerations

• The tongue may be held forward using a gloved hand or sterile 4 X 4
• Instruct patient to breathe deeply and slowly to assist in passing catheter through

Therapeutic Considerations

• Apply intermittent suction
• _______ catheter
• Limit actual suction time to _______ seconds
• Limit procedure to _______ seconds

Complications/Hazards

• Hypoxia
  – monitor for ↑
  – limit suction time
• Vagal Stimulation
  – monitor for ↓
  – perform slow, gentle insertion
  – limit
Complications/Hazards

• Atelectasis
  – Cause
    • Suctioning removes ________________
  – Prevention
    • __________
    • __________
    • Oxygenate between suction passes
    • Use proper size suction catheter

Complications/Hazards

• Trauma to the airway
  – Catheter tip contacts mucosa + suction =
    • Hemorrhage
    • Mucosal damage
    • Local inflammation
  – Well documented by autopsy reports: when suction applied, mucosa is elevated into catheter holes - epithelial cells are removed for entire length of suction time

Complications/Hazards

• Trauma to the airway
  – Prevention
    • Ring-tip catheters
    • __________ catheter while withdrawn
    • Intermittent suction
    • Limit suction __________ & pressure
Complications/Hazards

• Cardiac arrhythmias
  – Cause
    • Usually secondary to _______________
    • Also caused by hypoxia + vagal stimulation
      – Carina, trachea, pharynx, larynx
    • Vagal stimulation alone causes bradycardia & hypotension
    • Hypoxia can cause _______________

Premature Ventricular Contraction (PVC)
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Complications/Hazards

- Cardiac arrhythmias
  - Prevention
    - Gentle with suction catheter
    - Short suction times
    - Well &

- Hypotension
  - Cause
    - Bradycardia from stimulation
    - Prolonged coughing which interrupts venous return
  - Prevention
    - Gentle with suction catheter
    - Short suction times
    - Well &
Complications/Hazards

- Infection & most easily prevented
  - Cause
    - Non-sterile technique
    - Repeated passes with catheter
  - Prevent
    - __________________ technique with sterile equipment
    - __________________

Sterile Sputum Specimens

- Lukens tube
- Bottle in-line
- All samples labeled, bagged, sent to lab ASAP
  - C & S - anytime
  - AFB - AM x 3
  - Cytology