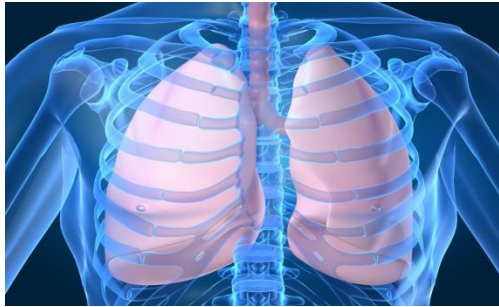
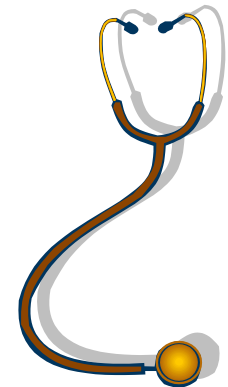


The RT's Role in Special Procedures – Intubation, Trachs, Bronchs & Chest Tubes



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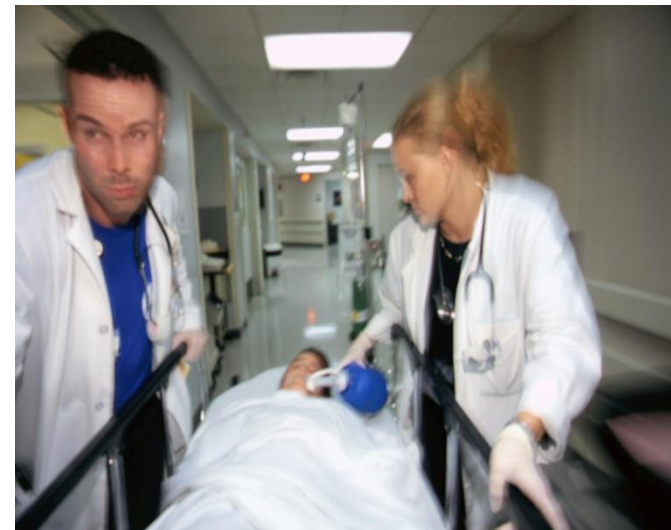
Learning Objectives

- Review the RT's role common to many procedures
- Examine procedure-specific functions, including:
 - Intubation
 - Tracheostomy tubes
 - Bronchoscopy
 - Chest tubes
- Distinguish the RT's role
 - *Before*
 - *During*
 - *After*
- Provide additional resources



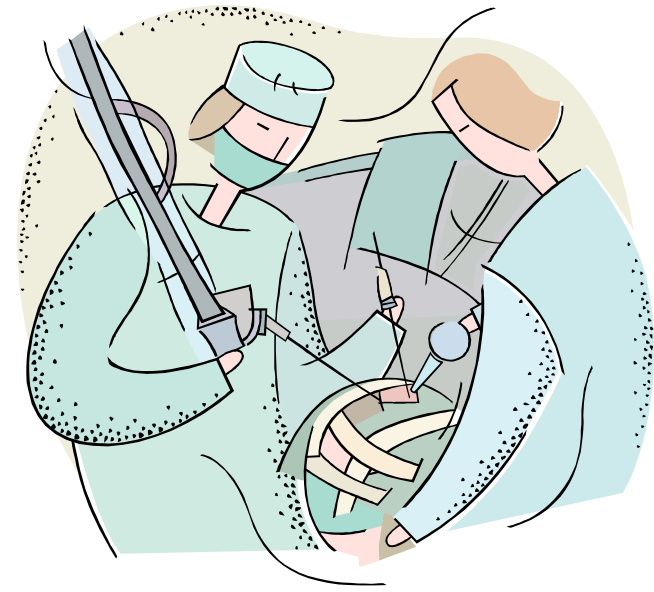
The RT's Role Common to Many Special Procedures - *Before*

- Know applicable policies, procedures
- Help identify the need for the procedure
- Check chart
 - MD's order
 - Informed consent
- Assist in patient and family education
- Assess Patient
 - Baseline clinical status
 - Contraindications
- Gather and prepare equipment
- If applicable, ensure pre-procedure “time-out”
 - Correct patient & procedure



The RT's Role in Many Special Procedures - *During*

- Patient Safety & Monitoring
 - Vital signs, SPO2, appearance
- Respond to adverse reactions
 - Stay with patient
 - Monitor
 - Provide support and treatment, as appropriate
 - Quickly obtain help
 - Communicate with others
- Assist physician
 - With actual procedure
 - Medications
 - Equipment



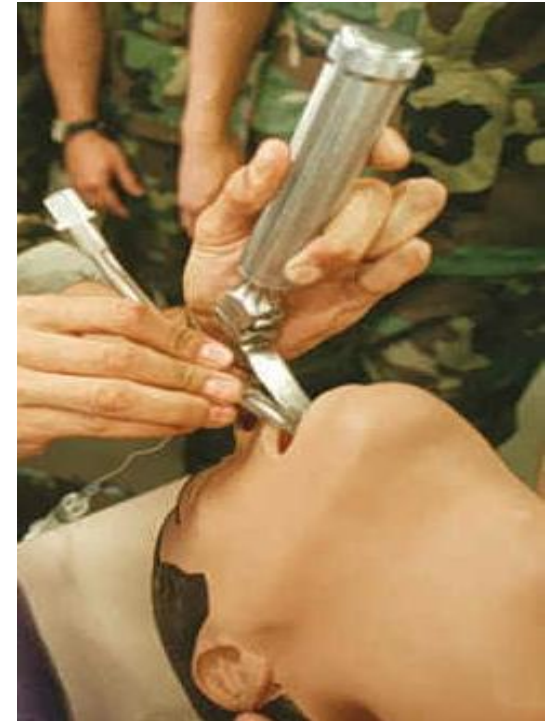
The RT's Role in Many Special Procedures - After

- Monitor patient
- Respond to adverse reactions
- Process equipment
- Document
 - What you did
 - How patient tolerated procedure



Intubation – Summary, Indications & Contraindications

- Major Indications:
 - Facilitate ventilation/oxygenation
 - Acute airway obstruction
 - Apnea
 - Cardiopulmonary resuscitation
- Contraindications:
 - Presence of a valid DNR/DNI order
 - Lack of properly trained personnel



RT'S Role *Prior to* Intubation

- Help identify potential need (e.g., Code Blue)
- Screen for contraindications (e.g., DNR)
- Prepare and test equipment including
 - Laryngoscope handle and blade (Test light & batteries)
 - Proper & multiple sized ETT (Test cuff)
 - 10 ml syringe, ETCO2 detection device
 - Oxygen source, AMBU & suction
- Patient Prep.
 - Hyperoxygenate and ventilate
 - Sniffing position (if no cervical injury)
 - Denture removal
- Recommend meds. (e.g., versed)

Recommended ETT and Laryngoscope Sizes

- ETT Tube Sizes

- Av. Adult – 8.0 - 9.0
- Sm. Adult – 7.0-7.5
- 16 YO – 7.0
- 3 YO 4.5 mm (uncuffed)

- Laryngoscope Sizes

- Large Adult – 4.0
- Av. Adult – 3.0
- Av. Ped. – 2.0



RT'S Role *During* Intubation

- Oxygenate & ventilate patient
- Assist physician with equipment (suction, ETT, syringe)
- Monitor patient and & adverse reactions
 - Severe hypoxemia
 - Vomiting/Aspiration
- Advise regarding elapsed time, # of attempts
- Inflate cuff once tube is (thought to be) in place
- Assess placement
 - Breath sounds, ETCO₂, Esophageal detection device
- Immediately extubate if placement in question

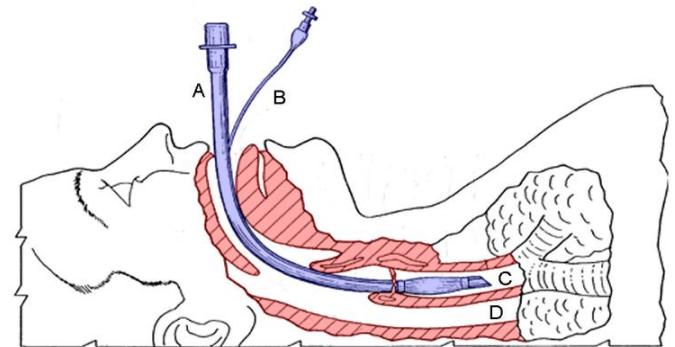
RT'S Role After Intubation

- Confirm placement
- Secure Tube & note placement level
- Re-assess patient
- Suction patient as needed
- Ensure chest x-ray is ordered
- Document in patient record
- Confirm that (verbal) order was written



Intubation Take-Home Notes

- Ensure patient is not a DNR/DNI, beforehand.
- In CPR, don't stop compressions for intubation
- For difficult intubations
 - Consider other airway alternatives (LMA)
 - Know thy limitations
- If in doubt as to whether ETT is in trachea, extubate and ventilate
- If breath sounds only on the right bronchus intubation
- Ensure CXR ordered



Tracheostomy Summary

- ***Is one of the most common special procedures done in the ICU.***
- *Technique is either*
 - *Open surgical, or*
 - *With dilator kit*
- **Can be done:**
 - Emergently in the ED or OR
 - Electively in OR or at bedside



Tracheostomy – Indications and Contraindications

- Indications:
 - Emergent: Airway compromise
 - Trauma
 - Epiglottitis
 - Elective
 - Long term ventilation
 - Anatomical abnormality
 - Obstructive sleep apnea
- Contraindications
 - Lack of informed consent
 - if elective
 - Uncooperative patient
 - Severe coagulopathy

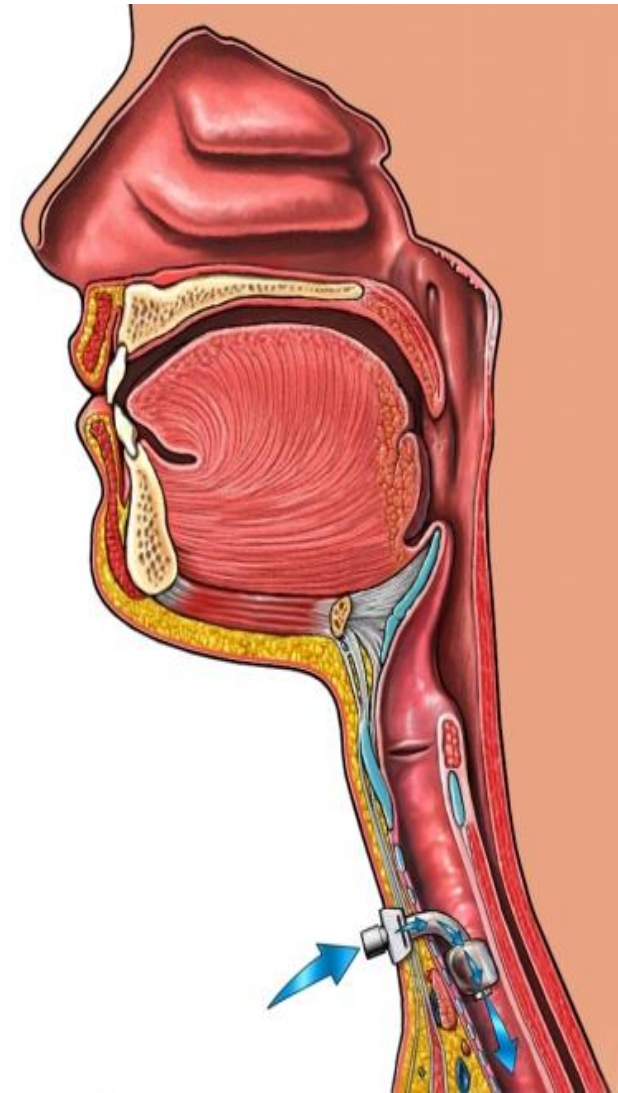


Open Surgical vs Percutaneous Dilation Technique

- Open Surgical
 - Surgical opening is established between the 2nd and 3rd tracheal ring.
 - More common than dilation method
- Percutaneous dilation
 - Guide-wire placement through the anterior tracheal wall, followed by progressive stoma dilation
- Both appear relatively equal in term of safety and efficacy (Susanto, 2002; Anderson, et al, 2001)
 - < 1% procedure-related mortality

RT's Role- For *Elective*, Open Surgical Procedure

- **Before:**
 - If elective,
 - Help identify the need (e.g., long term ventilation)
 - Check chart
 - Informed consent, MD's order, contraindications
 - Gather and set-up equipment
 - One size smaller Trach tube
 - Syringe (10 ML)
 - Scissors
 - Trach tube connector, if mechanically ventilated
 - Position patient and yourself
 - Airway access without breaking sterile field
 - Prepare existing airway
 - Loosen trach tie
 - Pre-oxygenate patient, as appropriate
 - Monitor patient



RT's Role- For Elective, Open Surgical Procedure

- **During:**

- Monitor patient for adverse response
 - Excessive Bleeding
 - SPO2 & vital signs
- Prepare to remove ETT
 - Loosen endotracheal tube holder
 - Connect syringe to pilot balloon
- On order of the MD:
 - Briefly take patient off ventilator, as appropriate.
 - Gradually, remove air from the existing airway cuff
 - Gradually retract existing ETT
- On order of Physician, remove ETT as trach tube is inserted
- Connect patient to vent, as ordered
- Confirm proper tube placement
 - Bilateral breath sounds
 - + ETCO2
 - SPO2 & Vital signs

RT's Role- For Elective, Open Surgical Procedure

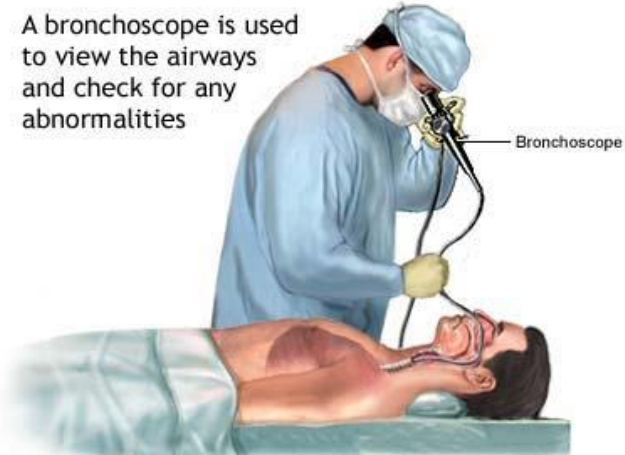
- **After:**
 - Return patient to original ventilator settings
 - Monitor patient for adverse response
 - Excessive Bleeding
 - Tube dislodgment
 - SPO2
 - Subcutaneous emphysema
 - Address any adverse reactions
 - Administer O2 as appropriate
 - Suction trach tube
 - Recommend chest x-ray
 - Document as appropriate

Trach Tube Take-Home Notes

- Make the correct tube size/type **& one size smaller**
- Watch for fire hazard from “layering” of oxygen beneath sterile drapes
- Don't get trapped at the head of bed without equipment and supplies
- Never remove the ETT until the physician says...typically done as the trach tube is inserted
- Always confirm proper placement

Bronchoscopy Assisting - Summary

- Generally involves using fiberoptic equipment to examine the upper airway, vocal cords, and tracheobronchial tree (to the 4th to 6th division bronchi)
- The indication(s) for performing the procedures may be diagnostic, therapeutic or both.
- Equipment may involve flexible or rigid bronchoscope.



Bronchoscopy: Indications and Contraindications

- Indications:
 - Diagnostic:
 - Investigate lesions, hemoptysis, etc.
 - Obtain lower airway secretions, cell washings and tissue samples
 - Therapeutic:
 - Mucous plug removal
 - Aid with difficult intubations
 - Retrieve foreign bodies
- Contraindications:
 - Lack of informed consent
 - Inability to adequately oxygenate
 - Coagulopathy or uncontrolled bleeding
 - Unstable hemodynamic status



RT'S Role *Prior to* Bronchoscopy

- Help identify potential need for procedure (see indications)
- Review chart:
 - Ensure MD order & signed informed consent
 - Review Contraindications
- Prepare and test equipment including bronchoscope, light source, monitor, meds, specimen traps.
- Patient assessment, education and pre-medication.
- Patient Prep, including
- Monitor clinical status

RT'S Role *During* Bronchoscopy

- Ensure proper functioning of all equipment
- Monitor patient and document vital signs, SPO2 and overall clinical status
- Respond to adverse reactions
 - Bleeding
 - Hypoxemia
- Assist physician in obtaining specimens and in medication administration.
- Ensure all specimen vials are properly labeled.
- Monitor and document as appropriate

RT'S Role After Bronchoscopy

- Monitor patient clinical status and respond as appropriate
- Clean, sterilize/disinfect and store equipment
- Ensure specimens are sent to lab
- Document results in chart and complete other records, as appropriate

Bronchoscopy Take-Home Notes

- Take “time-out” before hand.
 - Correct: patient, procedure
- Plan for the worst (Hazards).
 - For hypoxemia: Oxygen
 - For bronchospasm: bronchodilators
 - For mucous plug: mucomyst, NSS
 - For bleeding: Epinephrine, tamponade balloon
- Don’t administer meds not within our scope of practice (e.g., versed, epinephrine)
- Ensure equipment is properly processed and stored.

Chest Tube Summary

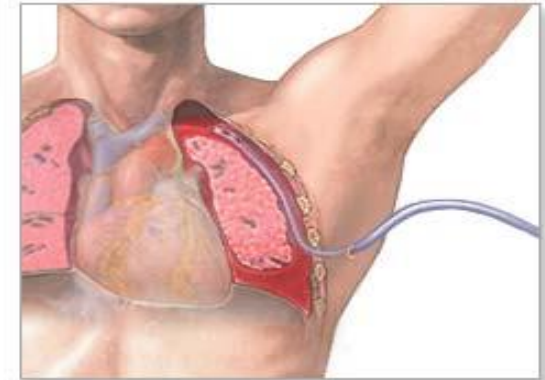
- Placement of a sterile tube (24-36fr) into the pleural space to evacuate air, fluid or blood
- Tube is generally inserted through:
 - Pneumothorax- 4th or 5th intercostal space at anterior axillary line
 - Pleural drainage: 7th intercostal space mid-clavicular line.
- Connected to a drainage system which often has three chambers
- Is a longer term alternative to a needle thoracostomy in the case of a pneumothorax

Chest Tube Indications and Contraindications

- Indications
 - Pneumothorax
 - Hemothorax
 - Empyema
 - Chylothorax (Collection of lymphatic fluid)
 - TX recurrent pleural effusion / pleural disease
- Contraindications
 - Severe coagulopathy
 - Uncooperative patient

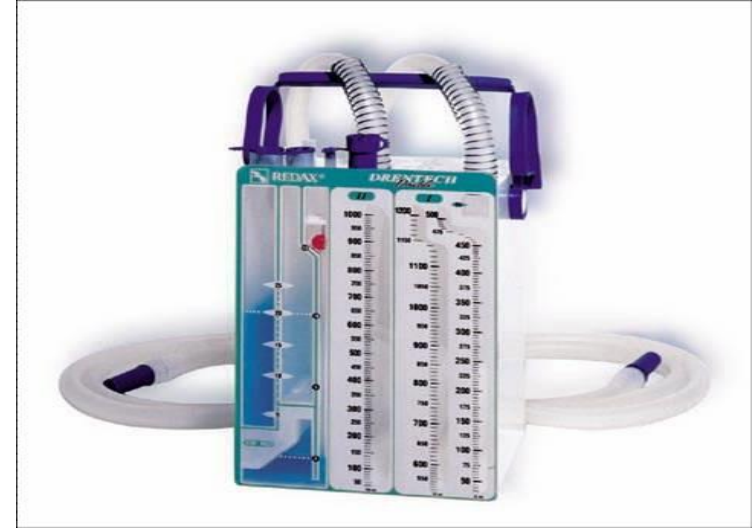


Chest tube drains blood from the lungs

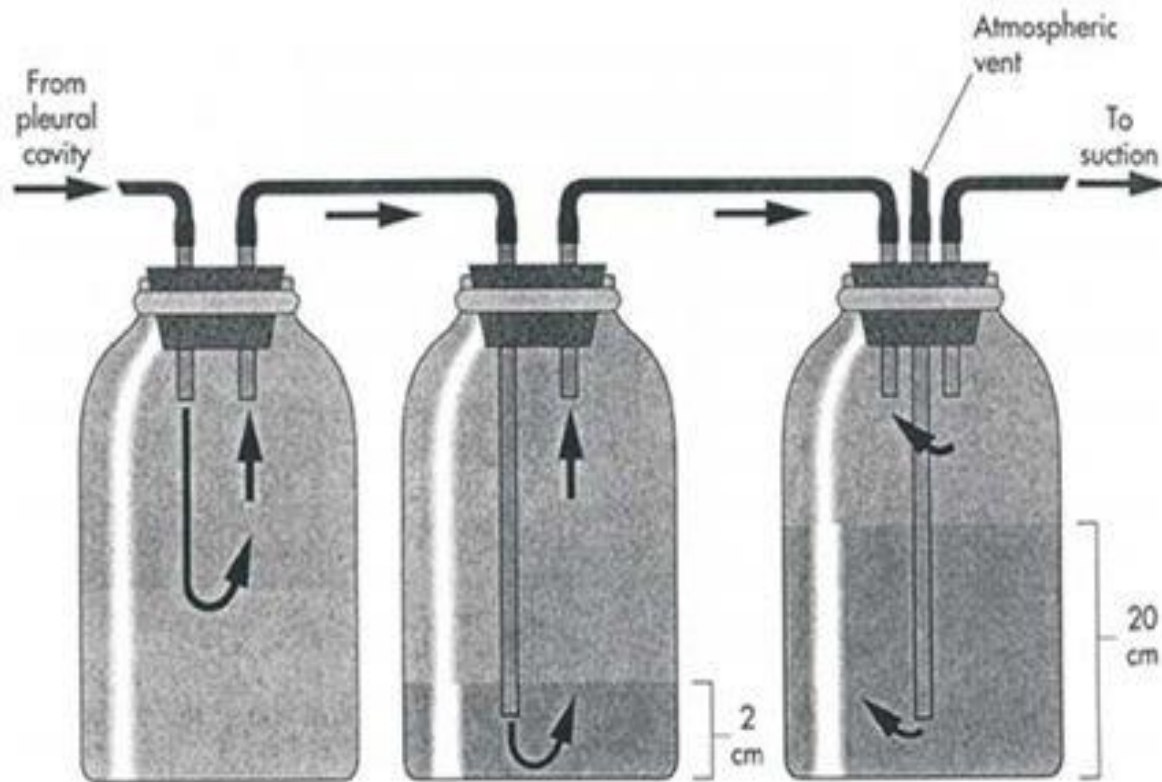


RT's Role

- Before:
 - Help determine the need
 - Help gather and set-up equipment
 - Monitor patient
- During and After:
 - Monitor patient for adverse response
 - Bleeding
 - Tube dislodgment
 - Secondary Pneumothorax
 - Ensure proper equipment functioning & **troubleshoot**
 - Document as appropriate



Chest Tube Drainage System



Basic Chest Tube Troubleshooting

- **If suction control chamber does not bubble:**
 - Adjust suction pressure (> 20 cm H₂O).
 - Check for tubing (from sx regulator to chamber) for leaks or obstruction
 - Ensure atmospheric vent is not obstructed
- **If water seal chamber stops tidal mov't:**
 - Check for a obstruction (clot or clog) in the tubing from device to patient
 - “Milk” the tube by compressing/releasing the tube from the patient towards the water seal chamber
- **Continuous bubbling in the water-seal chamber indicates the presence of a leak...**
 - ...at (or in) the patient...or,
 - ...in the drainage system (between device & patient)
 - To distinguish, briefly pinch the tube at the insertion point to the patient.
 - If bubbling stops, the leak is at the insertion point (tube is partially out) or in the patient (BP fistula).
 - If the bubbling continues, look for a loose connector or replace drainage system.

Chest tube Take-Home Notes

- Ensure that the patient is pre-medicated
- The tube should be inserted above, not beneath, the rib
- Once inserted, the tube should be secured
- Volume may be lost if patient is on a vent
- Recommend post-procedure CXR

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