

# Bronchoscopy SICU Protocol



Updated January 2013

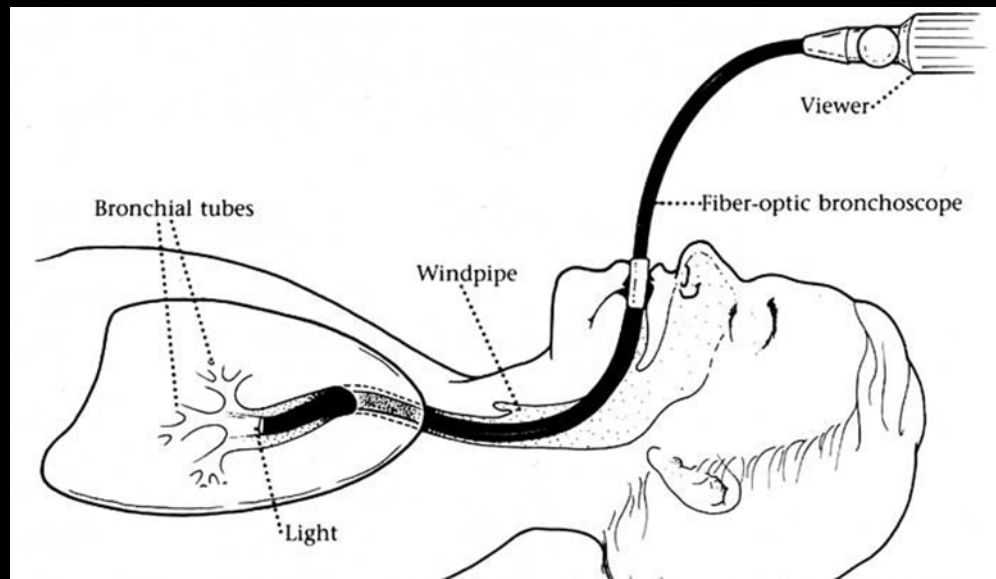
# Outline

- Clinical indications
- Considerations
- Preparation
- Bronchoscopy technique
- Bronchoalveolar Lavage (BAL)
- Post-procedure



# Purpose

Bronchoscopy is a procedure that involves placement of a viewing instrument into the tracheobronchial tree to diagnose or treat lung and airway problems.



# Clinical Indications

## Therapeutic

- Respiratory toilette
  - Secretion clearance
  - Atelectasis
  - Spine injury patients
- Lung abscess drainage
- Foreign body removal
- Difficult intubation

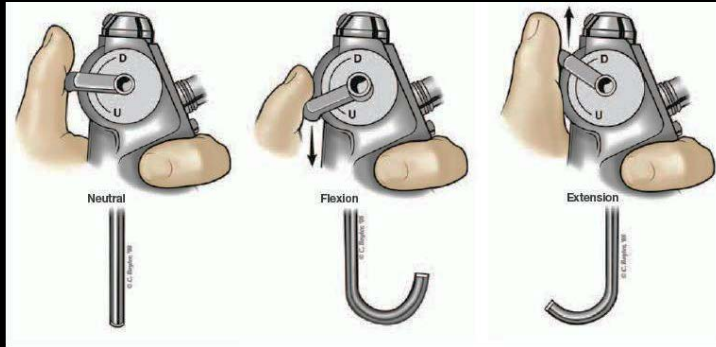
## Diagnostic

- Endobronchial sx
  - Hemoptysis
  - Obstructive pneumonia
  - Localized wheezing
- Selective bronchial culture
- Assessment of ETT position
- Evaluation of inhalation injuries



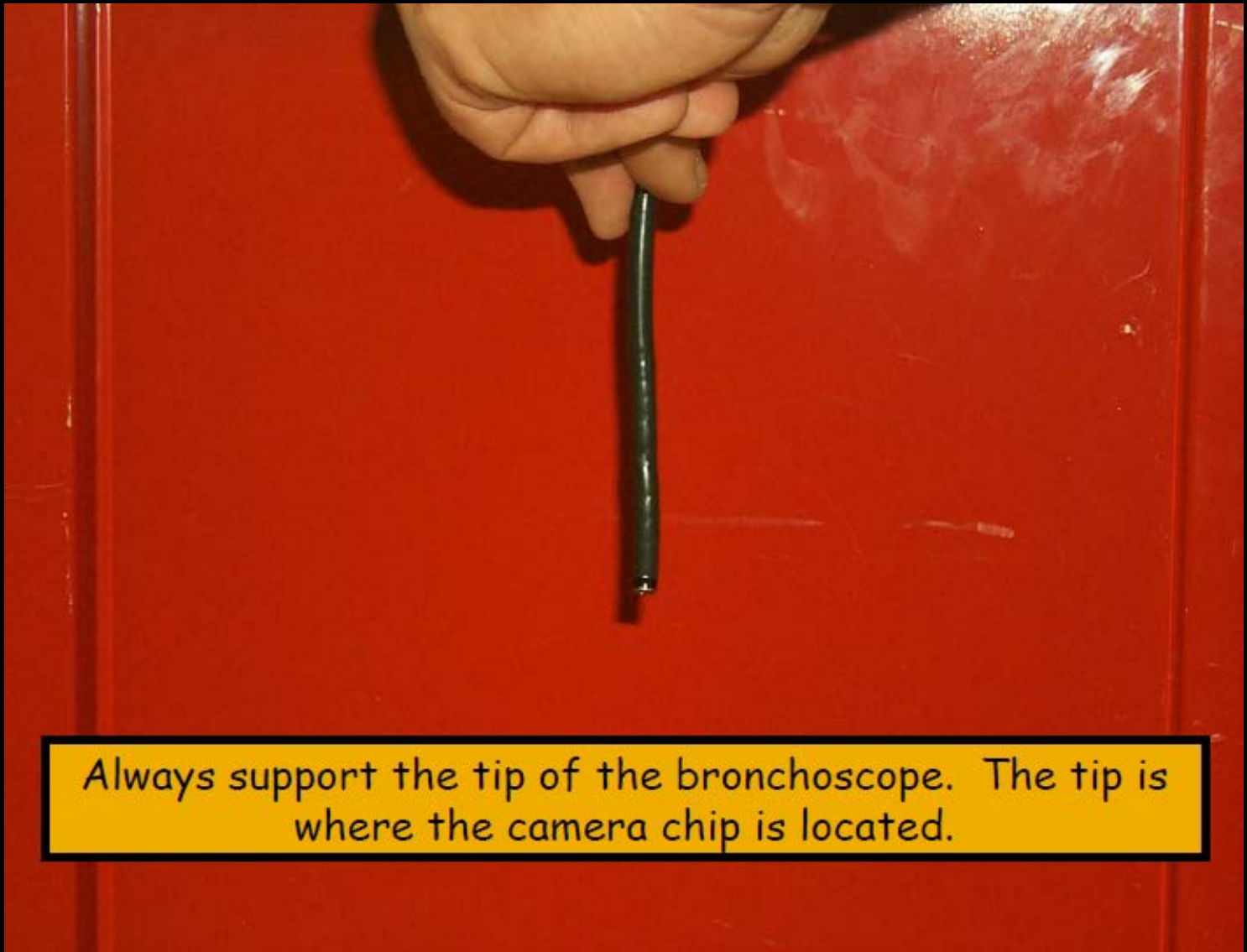
# Bronchoscope

- Flexible
  - Fiberoptic or video chip
  - Tip manipulated with levers and rotation of scope body



- Channel for irrigation, suction, biopsy forceps





Always support the tip of the bronchoscope. The tip is where the camera chip is located.





Always attempt  
to maintain a  
perpendicular  
angle with the  
scope to the  
patient.







Avoid excessive bending of the scope







DO NOT  
TWIST THE  
SCOPE WITH  
YOUR  
FINGERS

# Patient Considerations

- Ability to maintain oxygenation and ventilation
  - Peep < 14 cm H<sub>2</sub>O
  - Tolerate decreased minute ventilation
  - Not requiring high FIO<sub>2</sub> setting
- Absence of elevated ICP
- Minimal coagulopathy
- ET tube size ≥ 7.5 mm in diameter

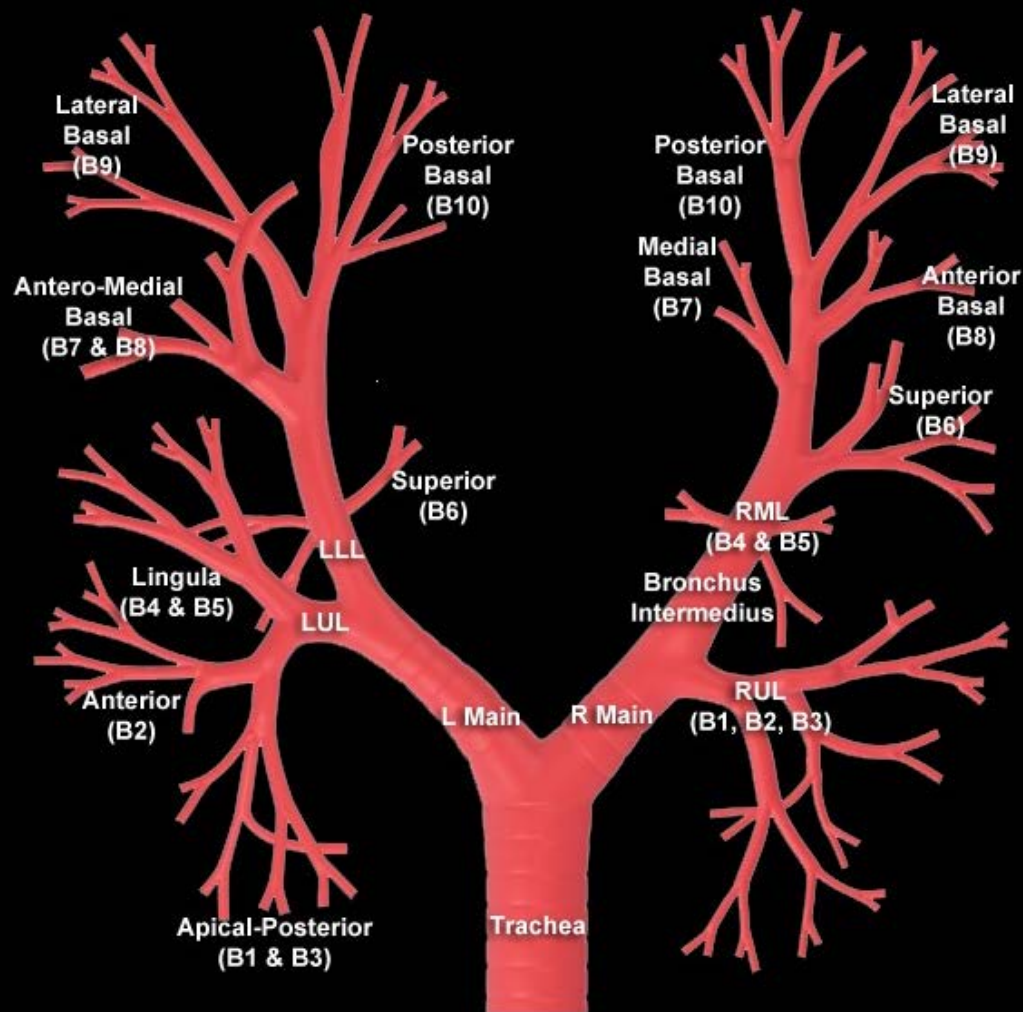


# Risks of Bronchoscopy

- Tube dislodgement
- Bleeding
- Infection
- Hypotension
- Hypoxemia
- Bronchospasm
- Pneumothorax, pneumomediastinum
  - Obtain post-bronchoscopy CXR
- Bronchial perforation
- Arrhythmia or AMI



# Airway Anatomy Review

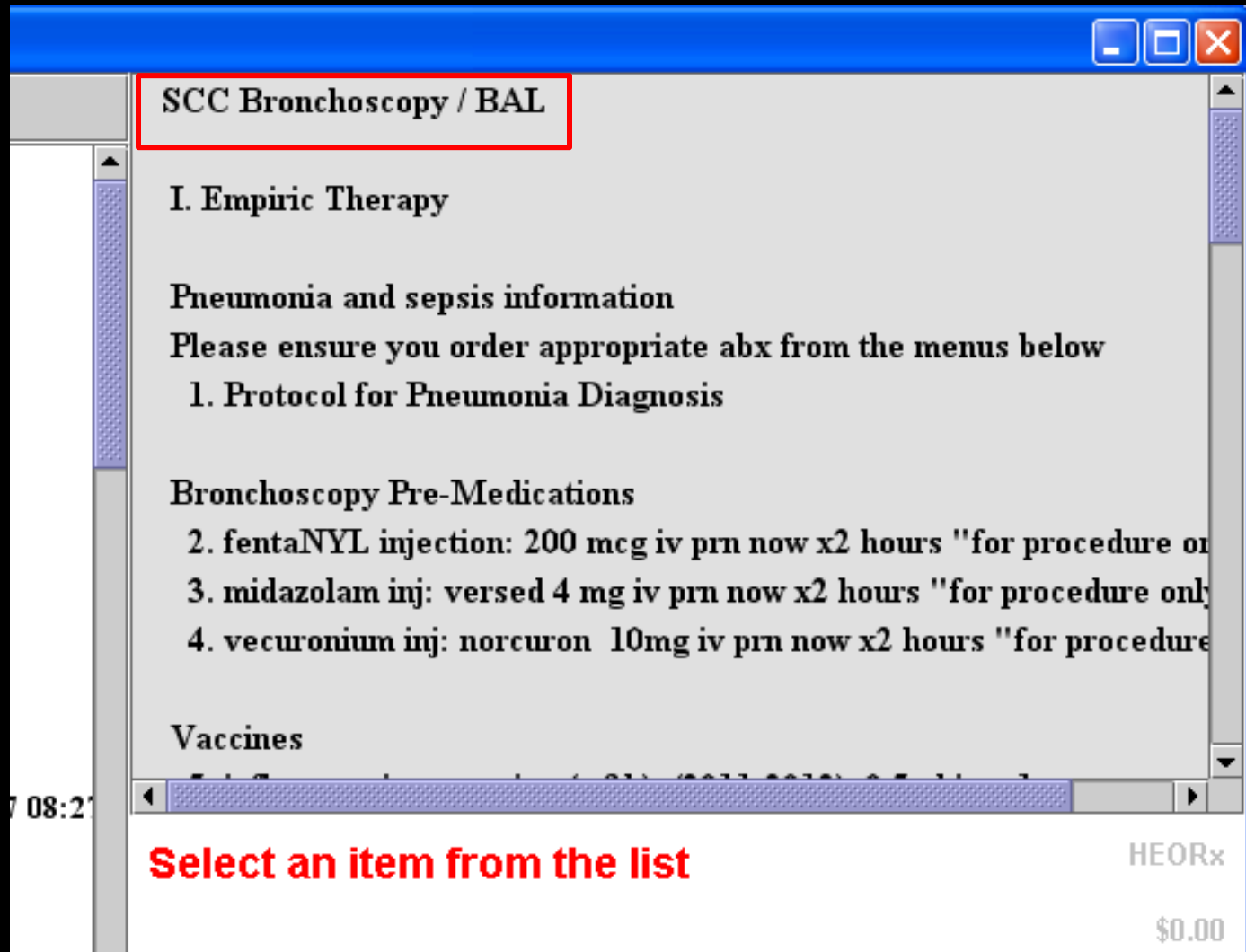


# Wiz Order Sets

- SCC Bronchoscopy / BAL
  - Procedure medications
  - BAL culture
  - Antibiotics
    - Order before scope so they can be hung immediately following
- Post-procedure CXR



# Wiz Order Sets



The screenshot shows a web-based order set interface. At the top, a blue header bar contains window control buttons. Below it, a red-bordered box highlights the title "SCC Bronchoscopy / BAL". The main content area is divided into sections: "I. Empiric Therapy", "Pneumonia and sepsis information" with a note to "Please ensure you order appropriate abx from the menus below", a numbered list starting with "1. Protocol for Pneumonia Diagnosis", "Bronchoscopy Pre-Medications" with a numbered list of four items (fentaNYL, midazolam, vecuronium, and others), and "Vaccines". A red instruction "Select an item from the list" is at the bottom left, and "HEORx" and "\$0.00" are at the bottom right. A timestamp "08:21" is visible on the left side of the interface.

**SCC Bronchoscopy / BAL**

**I. Empiric Therapy**

**Pneumonia and sepsis information**  
Please ensure you order appropriate abx from the menus below

1. Protocol for Pneumonia Diagnosis

**Bronchoscopy Pre-Medications**

2. fentaNYL injection: 200 mcg iv prn now x2 hours "for procedure on
3. midazolam inj: versed 4 mg iv prn now x2 hours "for procedure only
4. vecuronium inj: norcuron 10mg iv prn now x2 hours "for procedure

**Vaccines**

08:21

**Select an item from the list**

HEORx

\$0.00



# Wiz Order Sets - Continued

08:2

A. SICU Only Pneumonia ICU Day 1-4

18. vancomycin injection: \_\_\_\_mg iv \_\_\_\_ stat

19. ertapenem injection: invanz 1000mg iv q24h now "crcl > 30 ml/min  
crt"

20. ertapenem injection: invanz 500mg iv q24h now "crcl < 31 ml/min  
hemodialysis"

B. SICU Only Pneumonia ICU > 4

21. vancomycin injection: \_\_\_\_mg iv \_\_\_\_ stat

22. Tobramycin

23. levoFLOXacin inj: levaquin 750mg iv q24h now "crcl > 49 ml/min"

24. levoFLOXacin inj: levaquin 750mg iv q48h now "crcl 20-49 ml/min"

25. levoFLOXacin inj: levaquin 750mg iv now xl "crcl 10-19 ml/min  
hemodialysis"

Select an item from the list

HEORx





# Medications for Procedure

Must be adequately sedated for tolerance and comfort

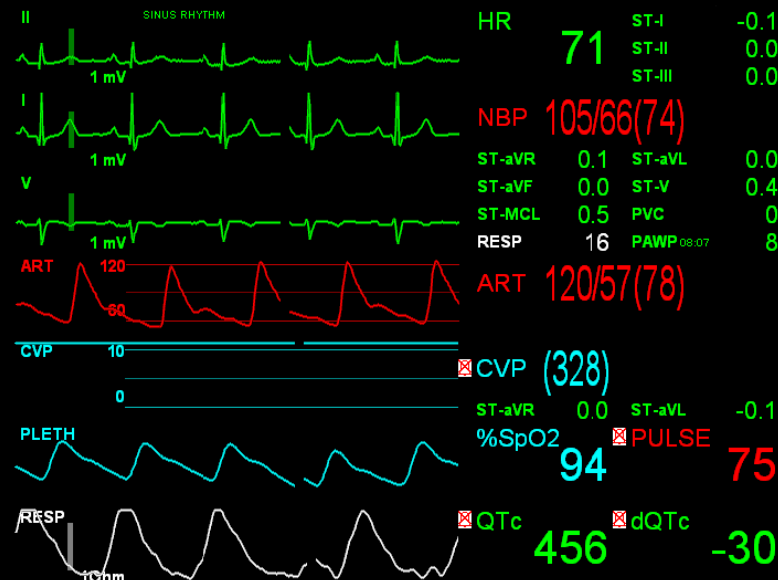
- Sedation/Analgesia
  - Narcotic/propofol/benzodiazapine
  - Supplemental sedation for ↑ HR and BP
- Paralytic agent
  - Vecuronium if hepatic insufficiency
  - Cisatracurium if renal insufficiency
- Lidocaine (non-bacteriostatic) – may consider
  - For inhalation via ETT/tracheostomy, do not administer IV



# Monitoring

Monitor to ensure adequate hemodynamics, minute ventilation, and O<sub>2</sub> sats maintained.

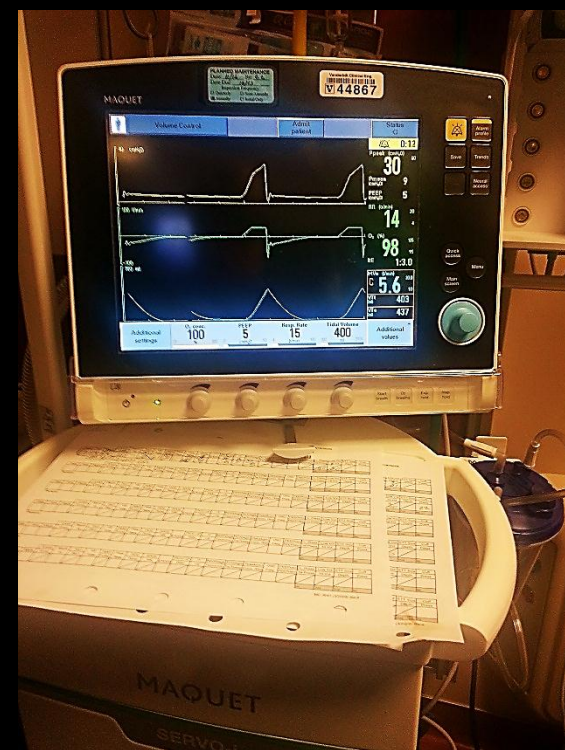
- Continuous pulse-oximetry & ECG monitoring
- Continuous or q5 minute BP monitoring



# Ventilator Adjustments

Contact respiratory therapist or fellow to make changes

- Volume control mode
  - Allows continued minute vent despite relative airway obstruction
- 100% FIO<sub>2</sub>
- High RR & Small TV
  - Maintain pre-procedure VE
- Decreased flow rates
  - Lengthen inspiratory time
- Adjust high pressure limits & alarms



# Equipment Preparation

- Bronchoscopy tower to bedside
  - Monitor with adjustable arm (1)
  - Light source (2)
  - Image box (3)
- Bronchoscope in container (4)
- Bronchoscopy supply bag (5)



# Equipment Preparation

- Bronchoscopy supply bag
  - Swivel adapter, biopsy and suction valves
  - Gauze and water-soluble lubricant
  - Suction tubing
  - Sterile bowl
  - Non-luerlock 20 ml syringes
  - Saline for irrigating & clearing suction port
  - Sputum trap if BAL needed
  - Sterile drape, towels, gloves, gown, mask with face-shield



Lubricate scope with water soluble KY jelly only. DO NOT use silicon spray. It is Freon based and will erode the latex on the scopes and is a pulmonary toxin.



# Set-Up

Connect swivel adapter





# Set-Up

Sterile table



PPE MUST be worn by all in the immediate area



# Set-Up



Place towels around swivel adapter, then drape

Connect scope to light source, then accordion connector to image box



# Set-Up



- Attach scope buttons
  - Suction valve
  - Biopsy valve
- Connect suction
- Confirm proper function



# Bronchoscopy Technique

- Procedural pause
- Bedside nurse to administer medications
- Procedure nurse will stabilize the airway
- Insert bronchoscope into swivel adaptor
  - Remember to recap or cover swivel adaptor when scope removed to maintain tidal volumes



# Bronchoscopy Technique



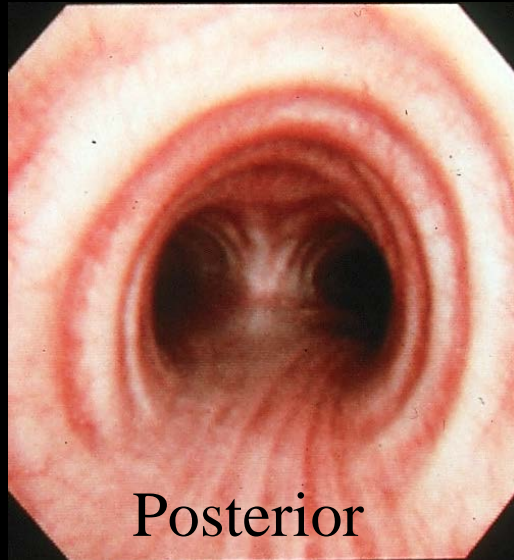
Pass scope through ETT or tracheostomy tube  
into trachea

- Advance with one hand
- Maneuver with the other





# Bronchoscopy Technique



- Visualize trachea, carina, and lobar bronchi
- Stay in the middle of the lumen at all times!



# Pathology



Blood clot



Tumors



Mucus plugs

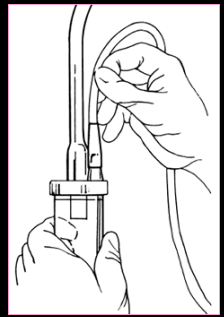


Esophageal fistula





# Bronchoalveolar Lavage



- Clear large airways of secretions as needed
- Advance to terminal bronchi in area of concern and wedge
  1. Irrigate with 20 cc aliquot and discard
  2. Attach sterile sputum trap to suction valve
  3. Irrigate with sequential 20 cc aliquots x 4





BAL Trap Connection to Scope  
Suction Tip

BAL Trap Connection to  
Sterile Suction

Keep sputum trap upright by  
securing a loop of suction  
tubing with your little finger



# Post-Procedure

- Rinse the scope by suctioning the enzymatic solution
- Wipe the scope with included sponge





Place scope in the plastic container, inside a biohazard bag and seal with a patient label



# Follow Up



- Order for quantitative bacterial Cx
- Order for cytology, if applicable
- Ensure specimen is delivered
- Chest X-ray
- Immediate Antibiotic Infusion



# Credits

- Jan 2013 update
  - Karole Davis, MD SCC Fellow
  - Billy Cameron, ACNP
  - Christy Thomas, RN Procedure Nurse
  - Raeanna Adams, MD SICU PI Chair
  
- Feb 2010
  - Cynthia Talley, MD SCC Fellow
  - Christy Thomas, RN Procedure Nurse
  - Addison May, MD SICU Director

