

**General recommendations**  
Suction through the endotracheal tube should be performed before bronchoscopy  
Avoid suction through the working channel of the bronchoscope  
Perform protected specimen brushing before bronchoalveolar lavage  
Set FIO<sub>2</sub> at 1.0

**Ventilated patients**  
Set peak pressure alarm at a level that allows adequate ventilation  
Titrate ventilator settings against exhaled tidal volume  
Consider neuromuscular blockade in addition to sedation in patients at high risk of complications who are undergoing prolonged bronchoscopy

**Protected specimen brushing (PSB)**  
Sample the consolidated segment of lung at subsegmental level  
If purulent secretions are not seen advance the brush until it can no longer be seen but avoid wedging it in a peripheral position  
Move brush back and forth and rotate it several times

**Bronchoalveolar lavage (BAL)**  
Wedge tip of bronchoscope into a subsegment of the consolidated segment of lung. If there is no obvious target area, choose non-dependent lung (e.g. upper lobe) for better return of BAL fluid.  
Inject, aspirate and collect 20 ml of sterile isotonic saline. Do not use this sample for quantitative microbiology or identification of intracellular organisms. It can be used for other microbiological analysis  
Inject, aspirate and collect additional aliquots of 20–60 ml  
The total volume of saline injected can be 60–200 ml

**Complications**  
Hypoxaemia (possibly less with smaller BAL volumes)  
Arrhythmia  
Transient worsening in pulmonary infiltrates  
Bleeding (particularly following PSB)  
Fever (more common after BAL)

**Positive results**  
>5% of cells in cytocentrifuge preparations of BAL fluid contain intracellular bacteria OR  
≥10<sup>3</sup> colony forming units/ml in PSB specimen OR  
≥10<sup>4</sup> colony forming units/ml in BAL fluid

**bronchoscopy**

specimens

indications

complications

contraindications

	Indication	Goal	
<b>Inspection</b>	Haemoptysis	Localise bleeding	
		Search for endobronchial lesion	
	Infection	Identify evidence of inflammation or sputum	
	Aspiration	Look for foreign bodies	
	Mass	Look for endobronchial masses	
<b>Sample collection</b>	Organ donation	Look at anatomy & evidence of lung injury	
	Chest trauma	Find evidence of airway injury	
	Inhalational injury	Find evidence of airway injury	
	Pulmonary infiltrates (infectious)	Obtain samples for gram stain, silver stain, bacterial cultures, viral and fungal studies	
	Pulmonary infiltrates (non-infectious)	Identify alveolar haemorrhage	
		Check for eosinophilia (analyse cell count and differential)	
	Mass or adenopathy	Perform transbronchial biopsy for cytology / pathology	
	<b>Interventions</b>	Haemoptysis	Control bleeding
		Bronchial obstruction	Remove mucus or foreign bodies
			Perform laser removal of masses
		Place stent	
Alveolar proteinosis		Perform lavage	
Intubation		Visualise anatomy for tube placement	
	Percutaneous tracheostomy	Visualise anatomy during procedure	

Intervention	Potential Complication	Prevention
Passing scope through the nose	Epistaxis, nasal discomfort	Topical anaesthesia & vasoconstriction
Passing scope through the pharynx	Gagging, emesis, aspiration	Topical anaesthesia, benzodiazepines
Passing scope through the trachea	Larygospasm, cough, laryngeal trauma	Topical anaesthesia
	Bronchospasm	Pretreatment with beta agonists
Bronchoalveolar lavage	Postprocedure fever	Minimize lung contamination by oral secretions
	Hypoxaemia	Supplemental oxygen
Cytology brush	Endobronchial haemorrhage	Avoid vascular lesions
Transbronchial biopsy	Haemorrhage	Avoid vascular lesions
	Pneumothorax	Avoid distal biopsies
Topical lignocaine administration	Arrhythmias, seizures	Use <7mg/kg lignocaine
Continuous sedation	Hypotension	i.v. access and prehydration in hypovolaemic patients
	Respiratory depression	Avoid oversedation

- absolute
    - (i) inability to maintain a patent airway during the procedure
    - (ii) inability to adequately oxygenate or ventilate during the procedure
    - (iii) active cardiac ischaemia
    - (iv) malignant arrhythmia
    - (v) severe haemodynamic instability
  - relative
    - (i) poor patient co-operation
    - (ii) elevated ICP
    - (iii) severe coagulopathy
- NB: patients with impending respiratory failure may undergo bronchoscopy more safely if the airway is secured