Used with permission from the BASDART Course Dr R Glasson And Dr S Chadwick
Adapted by Dr A Norman 2015

The Fibre-optic Bronchoscope

Visually guided techniques are always preferable to blind techniques, when appropriate equipment is available. The fibreoptic bronchoscope can be used as an adjunct for the unanticipated difficult airway in a “can’t intubate *can* ventilate” situation (**Plan B of DAS** guidelines). It can also be used *electively* in the patient with a known difficult airway to facilitate intubation using one of the following techniques:
1. Fibreoptically guided intubating LMA technique
2. Asleep fibreoptic intubation via the LMA or Berman airway

Indications

- Aid to intubation
    - Known / suspected difficult airway
    - Unstable C-spine
    - Place / confirm placement of tracheal tube (TT) / double lumen tube / bronchial blocker
    - High aspiration risk with potentially difficult airway
- ITU uses
    - Percutaneous tracheostomy
    - Bronchoalveolar lavage (diagnostic or therapeutic)
- Airway assessment (usually ENT)
    - Upper airway anatomy
    - Laryngeal / cord pathology
    - Infraglottic pathology – stenoses / masses / compression
- Teaching and Training

Contraindications

- Absolute
    - Patient refusal
- Relative (depending on operator skill)
    - Patient cooperation
    - Bleeding
    - Extensive facial / neck trauma
    - Critical upper airway obstruction
    - Requirement to secure airway immediately

Complications

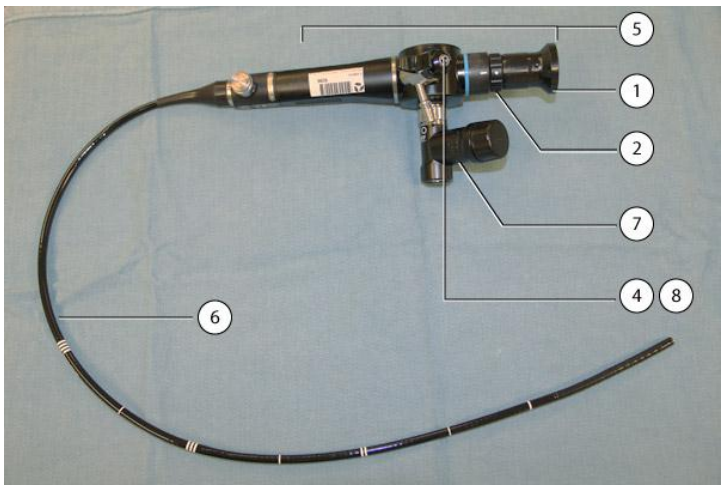
- Malposition
- False passage
- Haemorrhage
- Oesophageal perforation
- Surgical emphysema

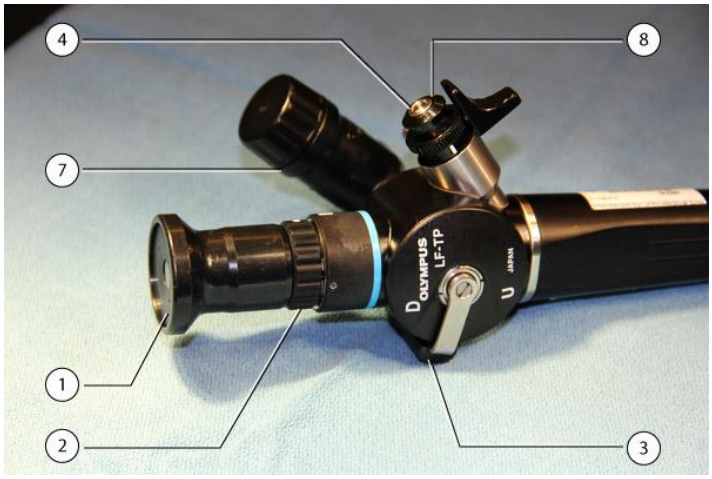
- Barotrauma / pneumothorax

Assembly, Manipulation and Steering of Scope

Description

- Standard 60cm length (range 50-65cm)
- Commonly 4mm diameter. Available 1.8 - 6.4mm diameter
- ↑ diameter = larger picture, better definition
- ↓ diameter = easier manipulation, less trauma, fewer ports
- Field of view: mostly 120°, range 90-120º





Main components

(1) Eye piece: Can be attached to a camera for display on screen. fibreoptic scopes have an eye piece; video scopes do not.

(2) Dioptre ring for focusing

(3) Control lever: Controls the tip. Only permits movement in a vertical plane. Two wires extend from the handle to the tip in the insertion cord. Moving the lever down, moves the tip up and moving the lever up, points the tip down. Side to side movement is accomplished by rotation of the body of the bronchoscope with the operator's wrist and shoulder.

(4) Working channel port: For suction, instillation of local anaesthetic, oxygen delivery.

(5) Body – incorporates above 4 items

(6) Flexible insertion cord
- 10 - 50,000 fibres depending on diameter
- Fibres around 20µm, total internal reflection
- Some bundles of fibres relay light, some relay image. Arrangement of image bearing bundles is identical each end – 'coherent'
- Lens to focus image on fibres
- Working channel
- Control wires to flex and extend tip

(7) Light source: Can be a portable battery powered source or via a cable. Light source may be halogen, incandescent or LED.

(8) Suction valve and port

Using the fibreoptic bronchoscope

1. Attach and turn on the light source.
2. Attach suction or oxygen at 2l/min.
3. Check focus and colour / white balance.
4. Hold body with lever facing toward operator.
5. Place thumb on lever, index finger on suction port.
6. The other hand guides the distal insertion cord.
7. Keep cord taut between hands so that the orientation of the tip remains the same as the body, and movements of the body are translated to the tip.
8. There are only 3 movements:
   - Rotation – directed from the body of the bronchoscope
   - Flexion and extension – using the lever
   - Advancement / withdrawal
9. Advance the bronchoscope through a manikin or Oxford box.

Tips

- Preparation – local anaesthetic, antisialogoue
- Assistant applies jaw thrust to increase space in posterior pharynx

Used with permission from the BASDART Course Dr R Glasson And Dr S Chadwick
Adapted by Dr A Norman 2015

- Maintain straight scope at all times
- Orientate yourself using the triangular 12 o'clock marker
- Aim for black
- Bring target ("black") into flexion plane (i.e. in line with marker, between 6 and 12 o'clock) by rotating, then advance towards it by flexing / extending.
- Keep target in the centre of the field of vision
- If you see red, withdraw until re-orientated, don't push further
- Advance bronchoscope to carina before advancing TT and take care when detaching TT

Common reasons for failure

- Operator inexperience
- Failure to negotiate nares
- Nostril patency
- Advancing TT too early

Care and Aftercare of the Scope

- Avoid excessive bending/twisting
- Use bite block in awake / unparalysed patients
- Avoid knocking insertion cord
- Keep hanging up with insertion cord straight
- Clean *immediately* after use
    - Don't let secretions dry – difficult to remove
    - Brush through suction port
    - Suck 1L water through suction port
    - Clean outside with weak detergent / sterets
    - Steris treatment (takes about 30min)

Tip

Use of the fibreoptic bronchoscope may result in a significantly increased workload for the anaesthetic assistant. Helping them out as much as possible will make their lives easier and improve your chances of being able to use it on the next patient / list.