# Low-frequency jet ventilation (LFJV):


LFJV is usually applied via hand-triggered devices such as the Sanders injector or **Manujet III** (VBM, Germany). Its application is usually limited to short investigative procedures such as laryngoscopy or bronchoscopy, but also has an important role as part of the management of a difficult airway or the 'can't intubate, can't ventilate' scenario via a cricothyroidotomy cannula.

In practice, cannulae or jet-tubes should be short, narrow-bore and non-compliant and are often already integral to devices such as the rigid bronchoscope or laryngoscope. The oxygen source (primary gas source) is the high-pressure wall-piped oxygen at 4 bar. This is passed through pressure-reducing valves and can be further adjusted via a regulator sited near the handset to a pressure that produces the desired chest-wall excursion and maintains oxygenation and adequate gas exchange. Short, rigid piping extends from the handset and must fasten securely to the cannula, usually via a Luer-Lock connection. The cannula must be secure to prevent dislodgement when the high-pressure jet is in use. The nozzle or cannula should also be aligned along the axis of the airway to be effective and prevent gastric distension if positioned above the glottis. The tidal volume is the sum of the injected and entrained volumes. A jet frequency of 8–10 $min^{-1}$ allows adequate time for exhalation via passive recoil of the lung and chest wall and prevents air-trapping and build up of pressure in small airways.

When used during surgical procedures, total i.v. anaesthesia is employed. If 100% oxygen is used as the jet gas, the effective $F_{I_{O2}}$ in the trachea is 0.8–0.9 because of dilution by entrainment of ambient air. A side-arm attachment to a bronchoscope or laryngoscope may allow oxygen entrainment instead of ambient air if the decrease of oxygen concentration due to entrainment is undesirable.

## INSTRUCTION FOR USE OF THE MANUJET III

The Manujet lll is designed for use with either oxygen or compressed air and is supplied with a pressure hose attached.

The Manujet lll requires a working pressure of 4-10 bar.

The patient can be connected via a Jet Ventilation Catheterwith a Luer Lock Connecting Tube on the Manujet lll.

The respiration pressure can be set by turning the knob of the pressure regulator according to the patient, e.g. for babies, children or adults. By squeezing and releasing the pressure regulator knob, the pressure regulator will bL opened or closed. The regulation of the respiration pressure and the frequency of ventilation can be chosen by the doctor, whereby the following values have to be considered as standard values.

The following volumes can be given to the patient with normal frequency of ventilation, based on an inspiratory- expiratory rate of 1:1.

| Patient/Catheter | Frequency of ventilation per minute | Injection Pressure | Volume in Litres |
|---|---|---|---|
| Adult. 13G | 12-13 times | 3.0 bar | 24-30 |