

» APPLICATION NOTE VENTRAIN® AND TRITUBE®

! This application note does not replace the Instructions for Use of Ventrain and Tritube !

Materials

- Ventrain
- Tritube
- Manometer
- Lubricant spray (e.g. silicone)
- Syringe with saline
- Syringe empty
- Side stream capnometer with liquid trap and/or filter
- Capnometer tubing with male Luer slip connector
- High pressure oxygen source (3.5 - 5.0 bar) with pressure compensated flow regulator
- Total intravenous anesthesia (TIVA), preferably in combination with muscle relaxation

Workflow for ventilation with Ventrain and Tritube

- 1 Connect Ventrain to the oxygen flow regulator.
- 2 Connect capnometer via side port of ventrain.
- 3 Inflate cuff Tritube - Check for leakage - deflate cuff.
- 4 Induce (deep) anesthesia (TIVA).
- 5 Visually access larynx and nose and remove secretions if present.

6 Oral intubation

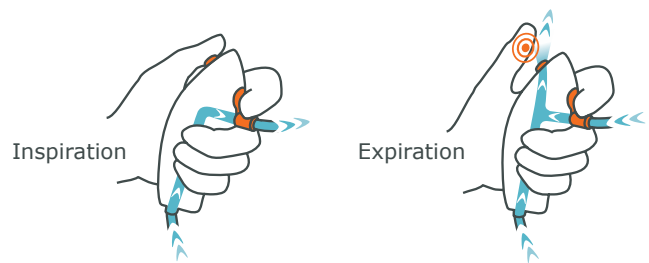
- Take out stylet Tritube, spray with lubricant and put stylet back.
- Bend tube in curve required for intubation.
- Local anesthetics may be applied to pharynx.
- Remove stylet Tritube after the tip has passed the vocal cords.

or

Nasal intubation

- Remove stylet.
- Local anesthetics may be applied to nasal cavity.
- Consider using a nasal trumpet (e.g. Mayo) to protect the nasal cavity from potential damage.
- Intubate Tritube.

- 7 Inflate cuff to be sure Tritube's tip is free from the tracheal wall.
- 8 Flush ventilation and pressure lumen with air to ensure absence of any obstructions.
- 9 Start ventilation with a flow of 10-15 L/min.



Flow (L/min)	6	10	12	15
Volume (mL) in 1 second	100	167	200	250

10 Continue ventilation:

- Observe the patient's chest excursions.
- Ventilate between Peak (Inspiration) and PEEP (Expiration) pressures as shown on the manometer.
- Volumes may be calculated based on flow and time (see table above).
- In case of (near) obstruction flush ventilation/pressure lumen with saline followed by air.
- In case of distraction, any doubt or to measure EtCO₂ (see next page) remove thumb and index finger from Ventrain (equilibration). Ventrain is functionally switched off, allowing passive expiration

Note that exhaled gases (and potentially secretions) exit via the thumb hole.



Capnometry

Note that a reliable etCO_2 measurement requires gas sampling during an equilibration phase and a sealed airway (inflated cuff):

- 1 Perform capnography via the side port of Ventrain.
- 2 A filter may be used to avoid contamination of the capnometer.
- 3 Insufflate to aimed intratracheal Peak pressure.
- 4 Start equilibration phase.



- 5 Read CO_2 value from curve when a plateau is nearly reached (taking approx. 5-8 seconds).
- 6 Resume ventilation.

Sedation and relaxation

Note that because of the small lumen (high resistance) coughing may result in dislocation of Tritube.

In case of light anesthesia, continue to ventilate and:

- 1 Deflate cuff of Tritube to reduce trachea stimuli.
- 2 Optimize anesthesia.
- 3 Inflate cuff when anesthesia is optimized.

Extubation

- 1 Stop TIVA.
- 2 Perform oral/pharyngeal suctioning to remove secretions if needed.
- 3 Deflate cuff while continuing to ventilate and to monitor intratracheal pressures. An open airway results in less pronounced pressure build-up. Intratracheal pressure build-up may appear during waking, indicating an increased glottic functioning.
- 4 After waking, confirm patient's ability to cough and inhale upon request (if not done spontaneously).
- 5 Extubate Tritube after confirmed stability of the patient's airway.

See next page for materials and workflow ventilation Ventrain and Tritube



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