



## Practice lecture of anesthesia equipments

### ENDOTRACHEAL TUBES

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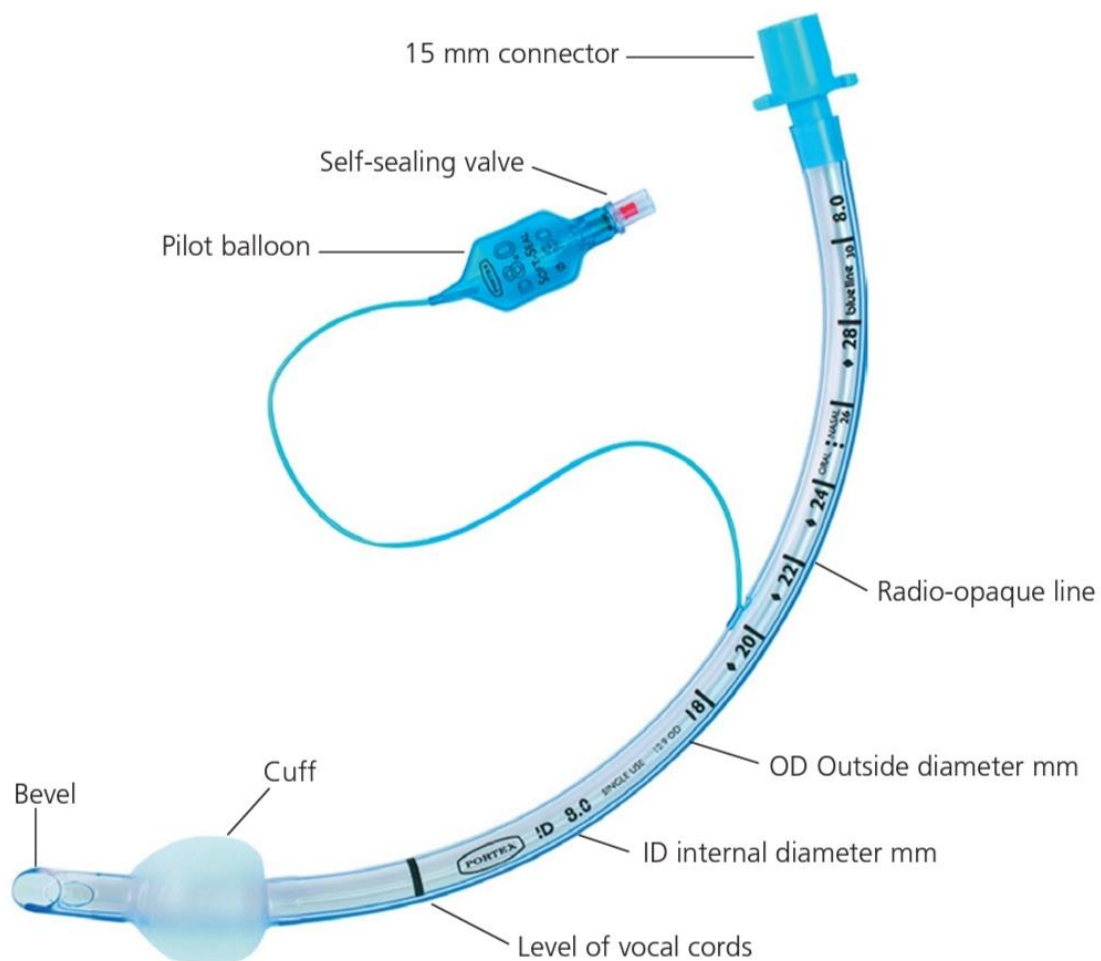
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## Tracheal tubes

Tracheal tubes provide a means of securing the patient's airway. These disposable plastic tubes are made of polyvinyl chloride (PVC)

As plastic is not radio-opaque, tracheal tubes have a radio-opaque line running along their length, which enables their position to be determined on chest X-rays. The siliconized PVC aids the passage of suction catheters through the tube. In the past, tracheal tubes used to be made of rubber allowing them to be reused after cleaning and autoclaving.



**Fig. 5.1** Features of a cuffed tracheal tube. Some designs have the markings of IT (implantation tested) and Z-79 stands (the Z-79 Committee of the American National Standards Institute). (Courtesy of Smiths Medical.)

## Endotracheal tube is consists of

- 1)15mm connector.
- 2)self-sealing valve.
- 3)pilot ballon
- 4)radio-opaque line
- 5)OD outside diameter
- 6)ID internal diameter
- 7)level of vocal cord.
- 8)cuff
- 9)Bevel and morphe eye

## Size of tracheal tubes

1. The 'size' of a tracheal tube refers to its internal diameter which is marked on the outside of the tube in millimetres. Narrower tubes increase the resistance to gas flow, therefore the largest possible internal diameter should be used. This is especially important during spontaneous ventilation where the patient's own respiratory effort must overcome the tube's resistance.

A size 4-mm tracheal tube has 16 times more resistance to gas flow than a size 8-mm tube. Usually, a size 8.5–9-mm internal diameter tube is selected for an average size adult male and a size 7.5–8-mm internal diameter tube for an average size adult female. Paediatric sizes are determined on the basis of age and weight. Tracheal tubes have both internal diameter (ID) and outside diameter (OD) markings. There are various methods or formulae used to determine the size of paediatric tracheal tubes.

**Table 5.1** A guide to the size and length of oral tracheal tubes used in paediatric practice

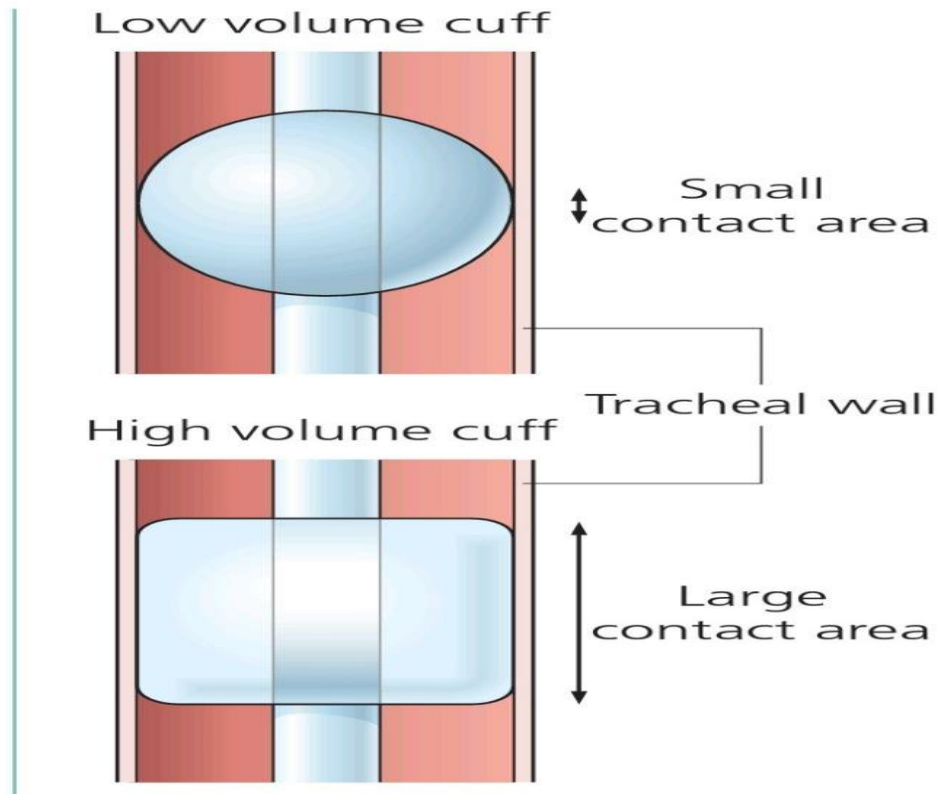
<u>Age</u>	<u>Weight (kg)</u>	<u>Size (ID mm)</u>	<u>Length (cm)</u>
Neonate	2–4	2.5–3.5	10–12
1–6 months	4–6	4.0–4.5	12–14
6–12 months	6–10	4.5–5.0	14–16
1–3 years	10–15	5.0–5.5	16–18
4–6 years	15–20	5.5–6.5	18–20
7–10 years	25–35	6.5–7.0	20–22
10–14 years	40–50	7.0–7.5	22–24

### High-pressure/low-volume cuffs

1. These can prevent the passing of vomitus, secretions or blood into the lungs.
2. At the same time, they exert a high pressure on the tracheal wall. If left in position for long periods, they may cause necrosis of the tracheal mucosa.

### Low-pressure/high-volume cuffs

1. These exert minimal pressure on the tracheal wall as the pressure equilibrates over a wider area. This allows the cuff to remain inflated for longer periods
2. They are less capable of preventing the aspiration of vomitus or secretions.



### **Route of insertion**

1. Tubes can be inserted orally or nasally.
2. The indications for nasal intubation include:
  - a) surgery where access via the mouth is necessary, e.g. ENT or dental operations
  - b) long-term ventilated patients on intensive care units. Patients tolerate a nasal tube better, and cannot bite on the tube. However, long-term nasal intubation may cause sinus infection.
3. Nasal intubation is usually avoided, if possible, in children up to the age of 8–11 years. Hypertrophy of the adenoids in this age group increases the risk of profuse bleeding if nasal intubation is performed.

## Problems in practice and safety features

1. Obstruction of the tracheal tube by kinking, herniation of the cuff, occlusion by secretions, foreign body or the bevel lying against the wall of the trachea.

2. Oesophageal or bronchial intubation.

3. Trauma and injury to the various tissues and structures during and after intubation.

trauma of lips, tongue , teeth

4- laceration of the pharyngeal or tracheal mucosa

5- injury of the vocal cords

6- laryngeal edema

7- cervical spine injury

8- laryngospasm , bronchospasm

9- tachycardia , hypertension

10- perforation of the trachea

11- hoarseness voice

Thank you

