



# Tracheostomy Tube Buyer's Guide



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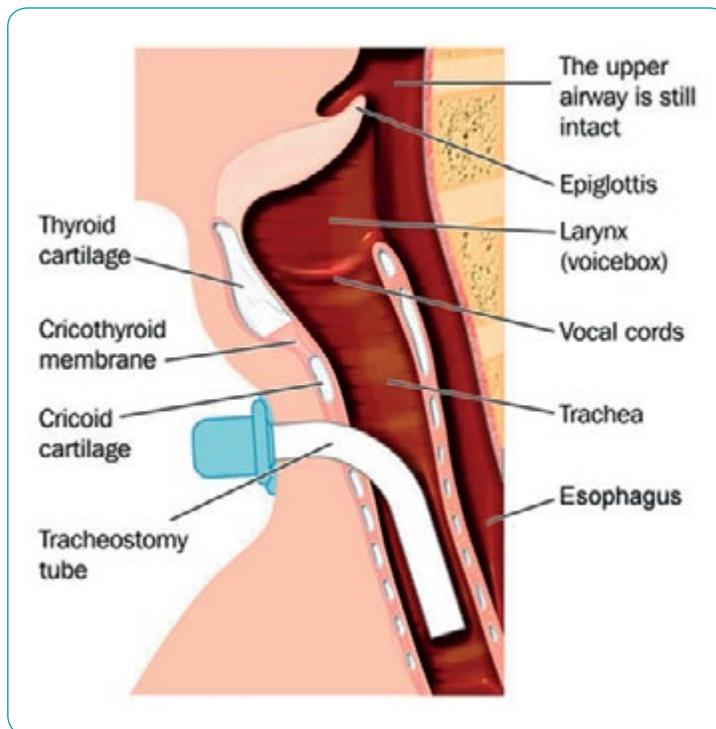
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## Understanding Tracheostomy Tubes

A tracheostomy tube (trach tube) is a curved tube that is inserted into the trachea through a tracheostoma (the surgical opening) to assist a patient in breathing when they cannot or have trouble breathing on their own.

They are supplied in a wide variety of styles and designs that differ in function, materials, construction, and accessories. This allows them to be classified according to shape, size, degree of flexibility, and other qualities, so it can get confusing.

Your trachs.com Buyer's Guide was created to help explain trach tubes and their features to help you understand what is available and assist you in making informed decisions.



# USES AND PARTS OF A TRACHEOSTOMY TUBE

## Uses of Tracheostomy Tubes

Tracheostomy tubes are used for different reasons. They can be used short-term when the upper airway system (mouth and throat) are not sufficiently open, thus restricting or blocking the airflow. Sometimes this airway restriction can be corrected, and use of a tracheostomy tube is no longer necessary. Tracheostomy tubes can be used long-term when the need for an alternate airway is more or less permanent. Another common use for a tracheostomy is to wean a patient off a ventilator on the intensive care unit.

Due to the many reasons for a tracheostomy, there is a wide array of different tracheostomy tubes to choose from.

The indications for tracheostomy can be divided into 6 main categories, as follows:

- Upper-airway obstruction
- Prevention of aspiration
- Long-term respiratory support
- Suctioning of retained bronchial secretions in patients who are unable to cough and in patients with chronic aspiration
- Elective airway management in head and neck oncological treatment including surgery and/or radiotherapy
- Treatment of patients with severe obstructive sleep apnea in whom positive-pressure therapy and other modalities have failed

## Parts of a Tracheostomy Tube

**Outer cannula:** The main body of the tube that is inserted into the trachea (windpipe). It stays there until it is time to replace the tube. Single-cannula tubes consist of only the outer cannula. Dual-cannula tubes consist of the outer cannula and an inner cannula.

**Tube shaft:** This is the part behind the neck flange that goes inside the body (through the tracheostomy). The diameter and length of the shaft varies depending on the anatomy of the user. The curvature of the shaft is generally standardized, but customization is available on some types of tracheostomy tubes.

**Inner cannula:** Some trach tubes have an inner cannula which allows secretions to be cleared by cleaning or replacement at regular intervals. The inner cannula is locked in place at all times to avoid accidental displacement unless cleaning or replacing.

**Connector:** The part that sticks out of the neck and can be connected to a ventilator, resuscitation bag or machine, Heat Moisture Exchanger (HME), or a speaking valve.

**Neck flange:** The neck flange keeps the trach tube properly placed, making sure it sits against the neck and doesn't migrate inward. It usually has holes on either side to secure it with neck ties. The flange can be rigid, or flexible to provide comfort and flexibility for the patient. The neck flange also contains important printed information on it about the tube: manufacturer, model name, inner diameter, outer diameter, and sometimes length.

**Cuff:** Some tubes have a cuff for patients who need ventilation or need to protect the airway. The cuff is inflated with an Inflation Line. The Pilot Balloon indicates whether there is air in the cuff or not.

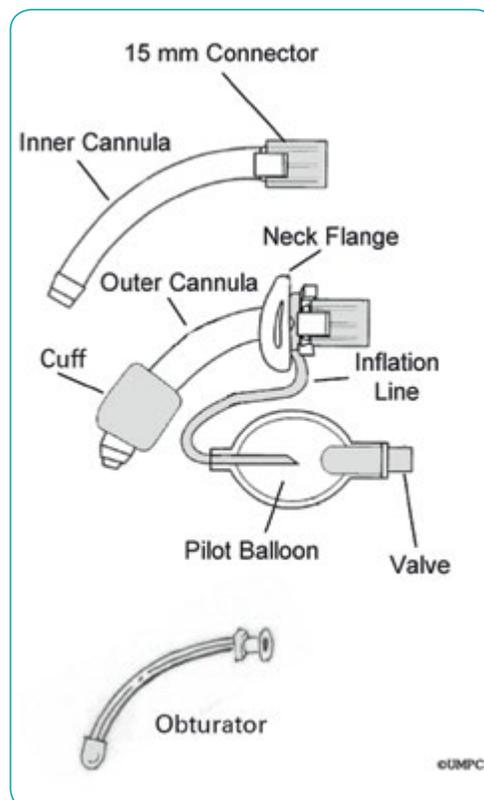
**Obturator:** The purpose of the obturator, which is sometimes called a pilot, is to assist with the insertion of the tracheostomy tube. The obturator is inserted into the outer cannula before tube placement and has a blunt tip to cushion the placement of the tube in the trachea in order to avoid tissue damage. Immediately following tube placement, the obturator is removed and replaced with the inner cannula.

## Types of Tracheostomy Tubes

Tracheostomy tubes have different designs and features to accommodate different needs. They can have a cuff or be cuffless, consist of a single tube or dual tube with inner cannulas, come with or without various connectors, be made of different materials, come in various sizes and lengths, have speaking options, have suction options, and are also provided with various accessories for different purposes. Here we will explain these features and the benefits of each for the patient.

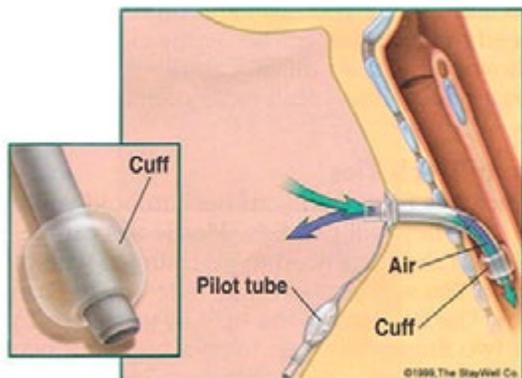
### Key Points

- Tracheostomy tubes can be classified into four categories: cuffed tubes with dual cannula, cuffed tubes with single cannula, cuffless tubes with dual cannula, and cuffless tubes with single cannula.
- Tracheostomy tubes are constructed of a variety of materials, including polyvinyl chloride, silicone, nylon, stainless steel, and silver. Plastic tubes have the advantage of being cheaper, lighter, and easier to modify.
- Tracheostomy tubes with inner cannulas should be used in patients who have large amounts of secretions. Some tubes are available with an integrated suction feature.
- Laryngectomy tubes are always cuffless and are usually shorter than a standard tube.
- Cuffless tracheostomy tubes can be used in patients who can protect their airway.
- Short-term tracheostomy tubes have a 15 mm connector to allow attachment to airway equipment. Long-term tracheostomy tubes may have a low profile flange which is more discreet but cannot be attached to airway equipment.



# CUFFED TRACHEOSTOMY TUBES

## Cuffed or Cuffless



**Cuffed:** A cuffed tracheostomy tube has a cuff that can be inflated to form a seal against the tracheal wall allowing no air to pass around the tube. All air is inspired and expired through the trach tube with none flowing upwards through the larynx (voice box), mouth, or nose. These tubes are used in patients who require ventilation or in patients with poor or absent swallowing ability to minimize the risk of aspiration. The cuffs may be filled with air, foam, or water. Air-filled cuffs have pilot balloons.

Cuffed tubes are used when the patient cannot protect their airway and aspiration is a risk, in a newly formed stoma in an adult, for positive-pressure ventilation, or when there is bleeding or an unstable condition. With cuffed trach tubes, the inflation line is used to inflate or deflate the cuff. At the end of the inflation line is a pilot balloon which indicates whether or not there is air in the cuff.

## Key Points

Indications for a **cuffed tracheostomy tube** include the following:

- Risk of aspiration
- Patient cannot protect airway
- Newly formed stoma in adult
- Positive-pressure ventilation
- Bleeding is present
- Unstable condition
- Poor or absent swallowing ability

Contraindications include the following:

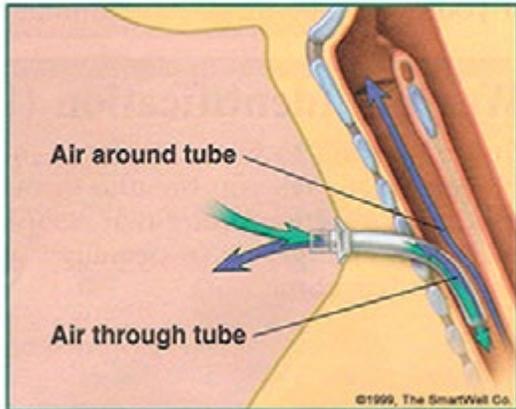
- Child younger than 12 years
- Significant risk of tracheal tissue damage from cuff
- Laryngectomized patients

Find Cuffed Tracheostomy Tubes on

[trachs.com](https://www.trachs.com)

DURACUFF® Tracheostomy Tubes  
DURATWIX® Tracheostomy Tubes  
TRACHEOTEC® Uni Tracheostomy Tubes  
SPIRAFLEX® Tracheostomy Tubes

# CUFFLESS TRACHEOSTOMY TUBES



**Cuffless:** Cuffless tubes are used in patients with a stable stoma, in patients who do not need positive-pressure ventilation, and in patients who wish to speak. Since these tubes do not have a cuff to protect the airway, they are used in patients who have no difficulty swallowing, have no danger of aspiration, and can manage their own secretions. They remove the risk of tracheal damage caused by an inflated cuff and since there is no cuff, they allow air to pass into the upper trachea and larynx so the patient can speak and cough normally. Cuffless tubes are usually used over a long period of time. They require a very accurate fit in order to prevent pressure sores in the trachea or at the tracheal stoma and also to ensure no air escapes. For long-term use, it is important to choose a tube made of a material that is suitable and approved for long periods of use.

## Key Points

Indications for a **cuffless tracheostomy tube** include the following:

- Stable stoma
- Patient can protect airway
- Adequate cough reflex
- Patient can manage secretions
- Allows for speech with speaking valve
- Does not need positive pressure ventilation
- Pediatric and neonatal patients
- Upper-airway obstruction due to tumors or neuromuscular disorders causing vocal cord palsy

Contraindications include the following:

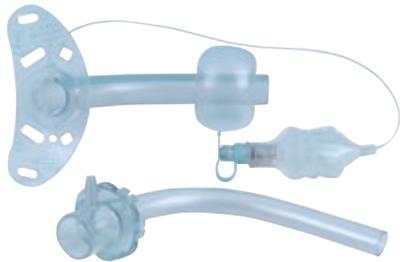
- Dependent on positive-pressure ventilation
- Significant risk of aspiration
- Newly formed tracheostomy

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DURATWIX® Tracheostomy Tubes  
TRACHEOTEC® Tracheostomy Tubes  
SPIRAFLEX® Tracheostomy Tubes  
SILVERVENT® Tracheostomy Tubes  
LARYNGOTEC® Laryngectomy Tubes  
Singer Laryngectomy Tubes  
Moore Tracheostomy Tubes  
LARYNGOTEC® Silicone Tubes

## Dual or Single Cannula



**Dual Cannula:** A dual cannula tracheostomy tube consists of the outer cannula plus an inner cannula, which is either reusable or disposable. Tubes with an inner cannula are used in patients who have large amounts of secretions. Secretions can build up on the inner surface of the tube and having an inner cannula that can be removed and cleaned facilitates maintenance of a clear airway.

**Single Cannula:** There is no removable inner cannula. Single cannula tubes maximize the inner diameter of the tube, thereby increasing the airway.



## Key Points

### Dual Cannula

- For managing copious secretions
- Can use disposable inner cannula or reusable inner cannula
- Inherently safer as the inner cannula may be removed quickly in the event of obstruction

### Single Cannula

- Has larger lumen, increasing the airway

Find these Trach Tubes on



#### Single Cannula Tubes on trachs.com

DURAVENT® Tracheostomy Tubes  
DURACUFF® Tracheostomy Tubes  
DURATWIX® Tracheostomy Tubes  
TRACHEOTEC® Uni Tracheostomy Tubes  
SPIRAFLEX® Tracheostomy Tubes  
SILVERVENT® Tracheostomy Tubes  
LARYNGOTEC® Laryngectomy Tubes  
Singer Laryngectomy Tubes

#### Dual Cannula Tubes on trachs.com

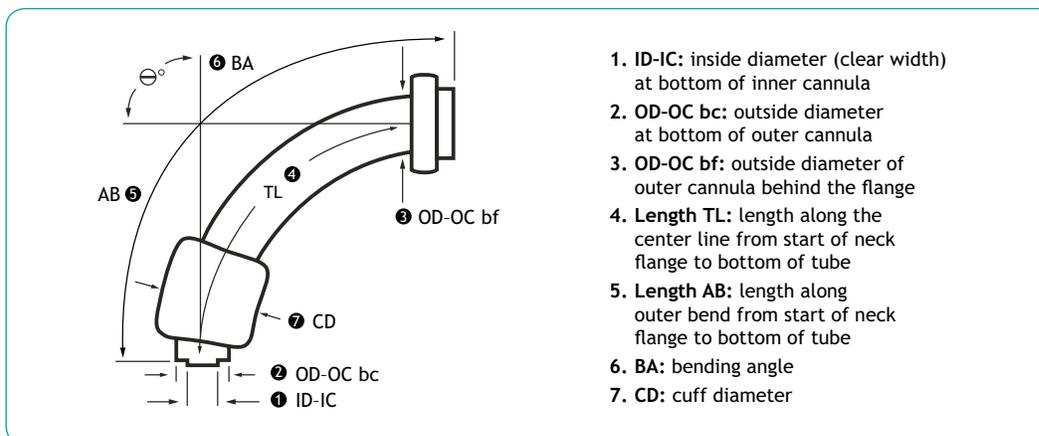
DURAVENT® Tracheostomy Tubes  
DURACUFF® Tracheostomy Tubes  
DURATWIX® Tracheostomy Tubes  
Moore Tracheostomy Tubes

## Sizing

The dimensions of a tracheostomy tube are given by their internal diameter, outer diameter, length, and curvature measured in millimeters.

A specific size from one manufacturer may not correspond to the same size with another manufacturer since there are two sizing systems in use today: the Jackson sizing system and the ISO (International Standards Organization) sizing system. The Jackson system was originally used with metal tracheostomy tubes and is still in use with some brands (Jackson and Shiley). It refers to the length and taper of the outer cannula. Other manufacturers use the ISO system which refers to the internal diameter of the outer cannula, or the inner diameter of the inner cannula if one is present, i.e., the smallest diameter that the airflow passes through. Similarly sized tubes from different manufacturers can also vary in length and curvature so check the dimensions carefully.

The ideal length of a tracheostomy tube is such that the tube tip lies a few centimeters above the carina. A tube which is too short carries a higher risk of accidental decannulation or partial airway obstruction due to poor positioning. A tube which is too long may impinge on the carina leading to discomfort and coughing.



**Extra-Long Tubes:** Sometimes an extra-long tube is used in cases of unusual anatomy, unusual pathology, or obesity. Most manufacturers will customize the length to be suitable for individual patients.

**Short/Laryngectomy:** For laryngectomees (people who have had a total laryngectomy) who need a tube to stabilize a newly created stoma or to prevent the stoma opening from shrinking. Also useful when the laryngectomee is having radiation treatment.

**Pediatric/Neonatal:** The unique attributes of infants and children require special tubes that come in a range of sizes. Due to their small size, the tracheostomy tubes are single cannula, and cuffs are avoided due to the delicate nature of the still developing trachea tissue. To avoid build-up of secretions, the tubes have to be changed more frequently.

## Materials and Design

Most modern tracheostomy tubes are made of medical-grade plastics such as silicone, polyvinyl chloride, polyurethane, or a combination. Early tracheostomy tubes were metal, either stainless steel or silver. Some people still use these, but most prefer the lighter plastic materials since they are also cheaper, easier to modify if necessary, and depending on the material, are more pliable. Also, metal tubes do not have a cuff so cannot be connected to a ventilator. Metal tubes or tubes made of polyurethane are thin-walled and thus have a larger lumen. PVC tubes have a thicker wall that limits the size of the lumen, but are very lightweight and more comfortable for long-term users.

Regardless of the material it is constructed of, the design of a tracheostomy tube can make a crucial difference to the patient. Lesions can be minimized by use of conically tapered tubes or with the help of a special insertion aid (obturator).

Furthermore, there is a choice between the standard bending angle of 90° and other angles, depending on the shape of the trachea. Angled tubes with a soft structure fit very well into the tracheal anatomy.

It is important to make sure that the bending angle of pediatric tubes is adapted to 110° to conform to children's anatomy.

| Tracheostomy Tube Materials |  |
|-----------------------------|--|
| Silver                      | Extremely thin walls for larger airway, antibacterial, high strength   |
| Reinforced                  | Ensures stable shape, x-ray contract   |
| Thermosensitive             | Extremely flexible, conforms to individual anatomic features   |
| Medical-Grade Polymers      | Comfortable, light, elasticity of material, better visual appearance, used for radiotherapy treatment (is x-ray transparent) |
| ▪ Polyurethane              | Soft, light, flexible  |
| ▪ Silicone                  | Soft and flexible, tissue-friendly, resists adhesions  |
| ▪ PVC (polyvinylchloride)   | High degree of biocompatibility and flexibility under changing temperatures and humidity                                     |

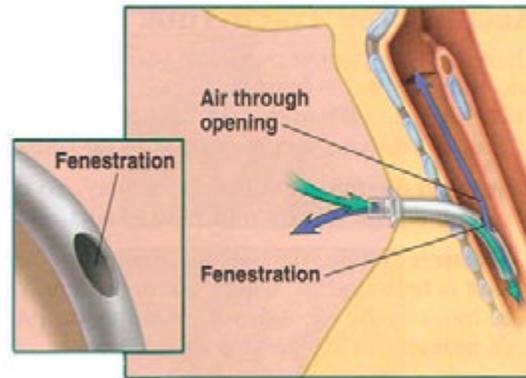
## Speech Option



For tracheotomized patients in whom vocal function is preserved, fenestrations allow the air to move up past the tracheostomy tube into the vocal cords so the patient can speak. Special **speaking valves** are available that close the tracheostomy tube automatically so the air can be diverted upwards through the vocal cords instead of out the tube. Since voice quality is improved if no air escapes around the stoma, it is important to have the correct size in place. Due to the danger of luminal obstruction, a speaking valve should only be used during the day and in patients who are cooperative and understanding. To enable patients requiring ventilation the ability for phonation, tubes can also feature a small opening directly above the cuff.

The external air (O<sub>2</sub> or compressed air) channeled through a thin inlet can be utilized for voice production.

**Fenestrations:** Fenestrations are small openings that allow for airflow around the tube, which allows the patient to breathe, speak, and cough normally. Fenestrated tubes may be considered for patients undergoing weaning from ventilation, as they facilitate speech and reduce the work of breathing in comparison to non-fenestrated tubes. They are also for patients who are on a ventilator but have difficulty using a speaking valve. Fenestrated tubes are not used with patients who require positive-pressure ventilation as some of the air will leak out of the openings. Multiple fenestrations (sieve) are preferred over a single opening since it better protects the trachea from injury during suctioning and is also associated with a lower risk of granulation tissue formation.



Even though their larynx and vocal cords have been removed, laryngectomized patients provided with a voice prosthesis (sometimes called a “TEP”) can speak again. This is achieved when the speaking valve on the tracheal stoma is shut during expiration and the expired air is rerouted through the voice prosthesis in the tracheoesophageal fistula (TEF). The air passes into the esophagus, thereby setting the vibrating segment in motion and enabling the creation of sounds and voice production.



**Talking:** Talking tracheostomy tubes are typically cuffed, with an additional lumen that terminates about the cuff and allows air to reach the vocal cords. When the tube is in the proper position and the connector attached to oxygen or an air-regulated gas source, air flows into the line and is directed upward to the vocal cords.

# UNIQUE FEATURES OF TRACHEOSTOMY TUBES

## Unique Features of Tracheostomy Tubes



**Adjustable Flange (neckplate):** These tubes are used in patients who have larger necks with a long distance from their skin to their trachea making it difficult to fit a standard tube.

**Additional suction channel:** Some tubes have a specifically designed suction channel to clear accumulations of secretions above the cuff. Some have specialized suction ports.



**O<sub>2</sub> Port:** Enables the supply of oxygen via a respirator.



**Connectors:** 15 mm, 22 mm - allows connection to ventilation, heat moisture exchangers (HMEs), and speaking valves.

**Disposable Inner Cannula:** The inner cannula is disposable which facilitates patient care and helps reduce the possibility of post-procedural infection.

**Custom Tube Designs:** When a standard tracheostomy tube does not provide an adequate fit for a patient, almost all manufacturers offer custom tube services. Modifications such as longer or shorter length, additional sizes, customized cuffs, modified neck flanges, curvatures, and fenestration locations are possible.

## Stoma Buttons

Stoma buttons are designed to be used in place of standard tracheostomy tubes to maintain the tracheostoma and/or to facilitate the use of a heat and moisture exchanger (HME). Their unique feature is a flange which resides on the anterior tracheal wall with no tube projecting into the trachea. Patients who require long-term tracheal access, but do not need positive ventilation or tracheal support find these devices comfortable and easy to use.



### Key Points

- Used in place of standard tracheostomy tube
- No tube projecting into trachea
- Not used with positive-pressure ventilation
- Long-term tracheal access
- Facilitate use of HME filter cassettes
- Can be used in combination with Hands-Free Speaking Valves

Find these Stoma Buttons on



Montgomery® Cannula System  
LARYNGOTEC® KOMBI Stoma Button  
LARYNGOTEC® Stoma Button

## HMEs (Heat-Moisture Exchangers)

A heat and moisture exchanger (HME) provides a highly effective respiratory air filtering function for patients with a tracheostomy tube. It is also called an artificial nose. It significantly reduces cooling and drying of the airway by retaining the patient's own expired heat and moisture, then returning both during inspiration. Use of the HME reduces irritation of the airway and associated thick secretions and crusting.



Find HMEs on



HUMIDOTRACH® HME  
HUMIDOTWIN® HME  
HUMIDOSTOM® HME  
HUMIDOFIX® HME  
HUMIDUAL® HME  
LARYVOX® HME

## Speaking Valves

Speaking valves are placed on the end of the tracheostomy tube to allow speaking in patients with vocal function. The valve flap is attached to the valve housing in such a way that, during inspiration, it opens and air can stream in. During expiration and speaking, the flap is pressed against the valve housing by the expired airflow and closes the cannula opening, creating the seal required for speaking.



There are two kinds of speaking valves: “biased closed” and “biased open”. Most common are the biased-closed, which means they are closed in the resting position. This has proven to have a beneficial impact on the ability to swallow. Biased-open valves have lower resistance to inspired airflow, and are therefore used by patients who cannot tolerate biased-closed valves, since some of the expired air is allowed to exit through the valve. Tracheostomy tube speaking valves cannot not be used on laryngectomized patients.

Find Speaking Valves on



Montgomery® Tracheostomy Speaking Valve  
Montgomery® Cannula Speaking Valves  
Montgomery® VENTRACH™ Speaking Valve  
HUMIDIPHONE® Speaking Valves  
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