

Surgical Airway

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If the upper airway is obstructed because of a foreign body or massive facial trauma or if ventilation cannot be accomplished by other means, surgical entry into the trachea is required. Historically, a surgical airway was also the response to failed intubation. However, surgical airways require on average about 100 seconds from initial incision to ventilation. [Laryngeal mask airways](#) (LMAs) and other supraglottic airways provide a faster means of rescue ventilation; because foreign body obstruction and (for an LMA) massive facial trauma are only rare contraindications to their use, very few patients require an emergency surgical airway.

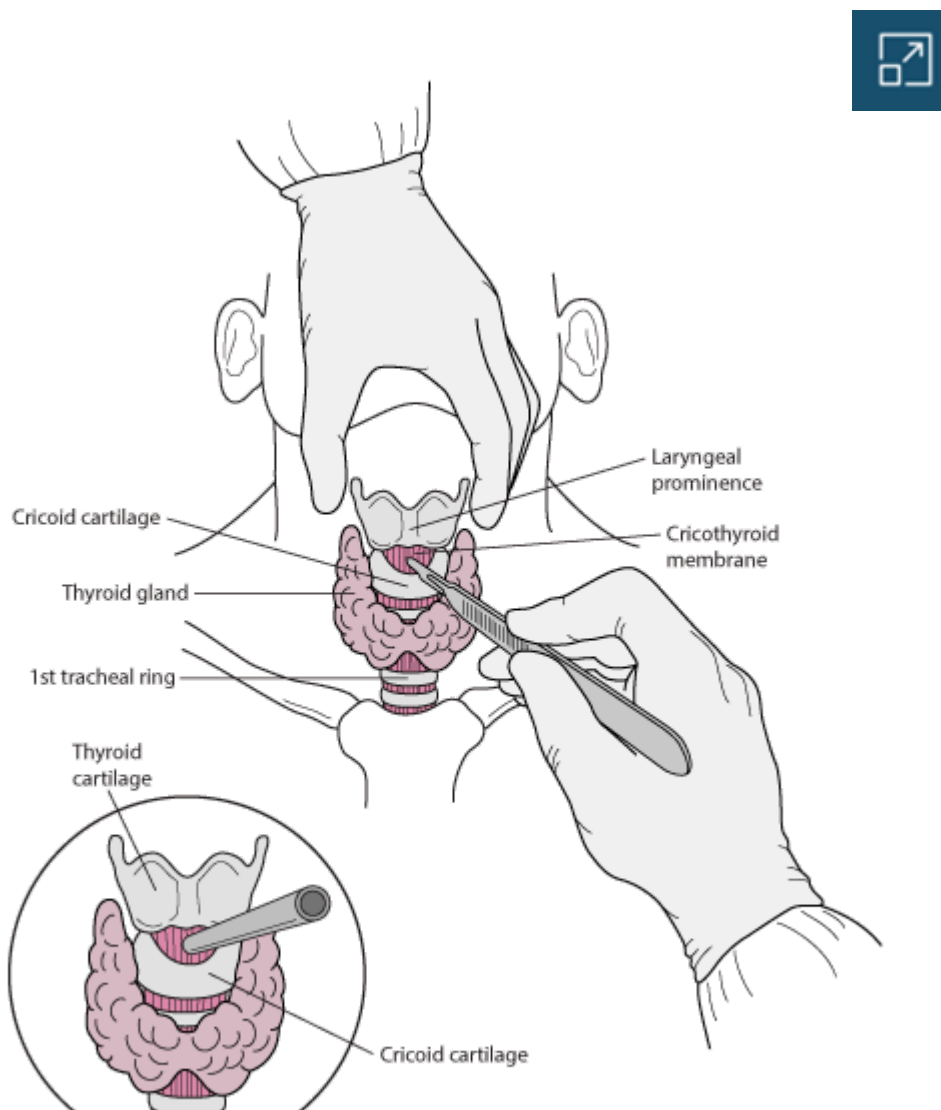
(See also [Overview of Respiratory Arrest](#), [Airway Establishment and Control](#), and [Tracheal Intubation](#).)

Cricothyrotomy

Scalpel cricothyrotomy/FONA (front of neck airway) is typically used for emergency surgical access because it is faster and simpler than tracheostomy (see also [How To Do Percutaneous Cricothyrotomy](#)).

Emergency cricothyrotomy

The patient lies supine with the neck extended. After sterile preparation, the larynx is grasped with one hand while a blade is used to incise the skin, subcutaneous tissue, and cricothyroid membrane precisely in the midline, accessing the trachea. A hollow tube is used to keep the airway open.





Unlike positioning for laryngoscopy or ventilation, the correct position for cricothyrotomy involves extending the neck and arching the shoulders backward. After sterile preparation, the larynx is grasped with the nondominant hand while a blade held in the dominant hand is used to vertically incise the skin, subcutaneous tissue, and cricothyroid membrane. A tracheal hook helps keep the space open and prevent retraction of the trachea while a small endotracheal tube (6.0 mm internal diameter [ID]) or small tracheotomy tube (cuffed 4.0 Shiley preferred) is advanced through the surgical site into the trachea.

Complications include hemorrhage, subcutaneous emphysema, [pneumomediastinum](#), and [pneumothorax](#). Various commercial products allow rapid surgical access to the cricothyroid space and provide a tube that allows adequate oxygenation and ventilation. Needle cricothyrotomy with large-bore IV catheters cannot provide adequate ventilation unless a 50-psi driving source (jet insufflator or jet ventilator) is readily available.

Tracheostomy

Tracheostomy is a more complex procedure because the trachea rings are very close together and part of at least one ring usually must be removed to allow tube placement. Tracheostomy is preferably done in an operating room by a surgeon. In emergencies, the procedure has a higher rate of complications than cricothyrotomy and offers no advantage. However, it is the preferred procedure for patients requiring long-term ventilation.

Percutaneous tracheostomy is an attractive alternative for mechanically ventilated, critically ill patients. This bedside technique uses skin puncture and dilators to insert a tracheostomy tube. Fiberoptic assistance (within the trachea) is usually used to prevent puncture of the membranous (posterior) trachea and esophagus.

Rarely, tracheostomy insertion causes hemorrhage, thyroid damage, pneumothorax, recurrent [laryngeal nerve paralysis](#), injury to major vessels, or late tracheal stenosis at the insertion site.

Erosion of the trachea is uncommon. It results more commonly from excessively high cuff pressure. Rarely, hemorrhage from major vessels (eg, innominate artery), fistulas (especially tracheoesophageal), and tracheal stenosis occur. Using high-volume, low-pressure cuffs with tubes of appropriate size and measuring cuff pressure frequently (every 8 hours) to maintain it at < 30 cm water decrease the risk of ischemic pressure necrosis, but patients in shock, with low cardiac output, or with sepsis remain especially vulnerable.

How To Do a Cricothyrotomy Using a Guidewire

VIDEO

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