

Airway Management

By Cyclops01

Airway management can be any number of procedures intended to assist a casualty victim in maintaining a patent (open) airway so that the victim can either breathe on their own or, receive ventilation through mechanical means. Maintaining a victim's airway can be a very simple, or an extremely complicated procedure, dependent upon any number of factors. As your group's emergency medical caregiver, you will have to understand these factors in order to assess the victim's airway condition and then make the most appropriate determination as to how the airway should be best managed. If a victim cannot breathe, irreversible brain damage will result within four to six minutes. Death will not be far behind.

What is a very simple situation? One of your group members has received an injury and is unconscious. To prevent a possible airway obstruction caused by the victim's own tongue, you manually position the victim's head to open and protect the airway. It don't get much simpler than that.

What is an extremely complicated situation? One of your group members has been stung by a hornet and is going into anaphylactic shock. The victim's tongue and throat are swelling, threatening to block the victim's airway and, the victim is about to vomit. Not only are you about to deal with an airway obstruction which will prevent an artificial airway (adjunct) from being inserted beyond the back of the tongue, you may also need to address aspiration of vomitus into the victim's lungs.

Basic Airway Management

A simple airway obstruction is usually created by the tongue in an unconscious injury victim. This is caused when the jaw relaxes and the tongue slips back against the inner wall of the pharynx. In a more mild obstruction condition, the victim will be making snoring sounds during respirations. When the obstruction is more severe, the victim will have no respirations at all and show signs of cyanosis. (turning blue) Airway obstructions caused by the tongue in unconscious victims, are usually simple to correct using a manual maneuver such as the head tilt – chin lift or, the jaw thrust.

But, What If...

There are always "what ifs" that may need to be considered. And one of those is; what do you do if there is an urgent reason why you cannot continuously hold the victim's head / chin / jaw in the position to maintain the airway and there is no one available to help? If you have little else to work with, you can pull the victim's tongue part way out of their mouth then insert a rigid ink pen cartridge through the tongue so as to block the tongue from going back into the mouth. Another "technique" is to pull the tongue part way out of the mouth and, using a safety pin, pin the tongue to the corner of the mouth.

This is an emergency situation under desperate conditions we are talking about here, so the ends justify the means.

Intermediate Airway Management

Taking a step up from the simple, the next level of airway management will require the procurement of some simple medical devices and an understanding of their use.

Besides the tongue, there are numerous conditions that can cause an airway obstruction, including the complications created by trauma and aspiration. As a result of trauma, the airway may be obstructed by loosened or broken teeth / dentures, blood, tissue or facial bone fractures. Penetrating or blunt trauma

NOTE: I am not a medical professional. The information and opinions presented are my own and are the product of personal research dealing with the subject matter. This information does not necessarily reflect the views and opinions of the Prepper Link administrators.

can fracture or displace the larynx, allowing the vocal cords to collapse. If an obstruction such as teeth, blood or other debris is allowed to enter the lungs by way of aspiration, the result can be serious to terminal as lung tissue can be destroyed.

Suction

A means of suction should be readily at hand to assist any victim who is unable to maintain their own airway. It is used to clear the mouth and airway of secretions, vomitus and other small particulates that could be aspirated. Further, to be on the safe side, you should assume that the victim has a full stomach and keep aware for possible vomiting.

Suction can be performed using something as simple as a rubber bulb and tube type cooking baster, or more professional disposable suction devices can be purchased for under \$35.00 through online sources.

Bag Valve Mask Device (BVM)

Once an airway device is inserted, you may now need a means of delivering air to ventilate the victim, if the victim is unable to breathe on their own. Enter the bag valve mask device; a rubber bag roughly the size and shape of a football which, when squeezed, pushes air out one end and when released, draws air in through the other. Flap type valves make this push / pull action possible. Lastly, a mask is attached to the outlet tube of the bag, which fits over the nose and mouth, to deliver air to the victim. In the case of the next two described airway devices, the devices will not interfere with the fit or function of the mask.

There are several types of BVM available, including one that is compressed and packaged so as to be carried in a cargo pocket. **BVMs** can be purchased online and are priced starting around \$12.00 plus shipping. The "**Pocket BVM**" is priced at about \$35.00 plus shipping.



The Procedures:

Nasopharyngeal Airway (NPA)

The **nasopharyngeal airway** is composed of a soft rubber tube (of varying sizes for children to adults) that is inserted through the nose and into the pharynx area, where it: 1) prevents the tongue from blocking the airway, 2) allows air to pass through the nose to the lower airway and 3) provides airway management when oral suctioning is necessary. The NPA is much better tolerated than an oral airway in conscious or semiconscious victims who have an intact gag reflex. It is best applied to victims suffering mouth injuries that include broken teeth and / or massive oral tissue damage.

The NPA should not be used in victims who show any evidence of head injury, traumatic injury to the roof of the mouth where brain matter is exposed or when there is cerebrospinal fluid (CSF) draining from the ears, nose or mouth.

Oropharyngeal Airway (OPA)

The **oropharyngeal airway**, also called a "J" tube, is a curved hard plastic tube that fits over the back of the tongue with the end of the tube resting against the back of the pharynx, effectively holding the tongue away from the pharynx and preventing an obstruction. Its design also allows for drainage and / or suction of secretions so as to prevent aspiration.

Although extremely easy to insert, the OPA should not be use in victims who are conscious or who have an intact gag reflex as it is likely to cause the victim to vomit

Airway Management (Continued)

and create a possible aspiration condition. To assess a victim for a gag reflex, prior to insertion of any airway device, gently stroke the victim's upper eyelashes. If the lower eyelid contracts, the victim will most likely have an intact gag reflex.

An OPA should not be used in victims who have suffered trauma to the face. Also, vomiting may occur as the OPA is being removed from the victim, making it prudent to have a suction device readily available.

Advanced Airway Management

Advanced airway management devices and / or techniques require more specialized medical instruments as well as a skill level gained through training and "hands on" experience.

Medical devices needed for advanced airway management include;

Magill Forceps are long, angled forceps with non-pointed ends that are used in conjunction with a laryngoscope, to locate and remove larger airway obstructions that suction cannot remove.

Tracheal Hook (or cricothyrotomy hook) is a long, sharp hook device used to control the cricoid ring when performing an open cricothyrotomy.

A **Cricothyrotomy kit** containing all the items needed to perform a tracheotomy is available from Amazon. All other items discussed in this article are available through other online vendors to include eBay.

Trousseau Tracheal Dilator Forceps are curved end forceps used to dilate the incision and position the tracheal tube during an open cricothyrotomy. Trousseau Forceps are available online, starting at about \$25.00 plus shipping.

Laryngoscope is a device utilizing either curved (Macintosh) or straight (Miller) lighted blades used to visually inspect the larynx, perform procedures in the larynx area or to assist in the placement of orotracheal intubation.

The Procedures:

Airway Obstruction

If the basic airway maneuver of suctioning does not remove an obstruction, advanced airway procedures may be required. In this case a laryngoscope is used to light and identify foreign objects in the larynx then Magill Forceps are used to grasp and remove the object.

Nasotracheal Intubation

Nasotracheal intubation is the insertion of an endotracheal tube into the trachea through the nose. Although the use of this procedure is less common than orotracheal intubation, it is an excellent technique for controlling an airway in situations where it is difficult or dangerous to intubate a victim using a laryngoscope. For example; there is a small percentage of people who have congenital laryngeal defects, such as a curve, that can be torn if a laryngoscope blade or the orotracheal (mouth inserted) intubation tube is forced into position.

Nasotracheal intubation is indicated in victims who are breathing on their own but require definitive airway management to prevent further deterioration of their condition. The procedure works well on victims who are conscious, victims with altered mental status and victims with an intact gag reflex. It should not, however, be used in victims who have suffered a respiratory or cardiac arrest event, or in victims with head trauma with possible midface fractures, as evidenced by CSF drainage from the nose.

Orotacheal Intubation

Orotacheal intubation is the insertion of an endotracheal tube orally, through the vocal cords and into the trachea. Endotracheal intubation using a cuffed tube is the

preferred standard of airway care in a victim who cannot protect their airway or who requires assistance with breathing. The procedure is performed in conjunction with a laryngoscope, which is used to light the path to the larynx and help guide the tube into proper position.

The primary advantage of orotracheal intubation is that oxygen, medication and suction can be directed into the trachea through the endotracheal tube. The disadvantages of this procedure include slowing of the heart rate due to the laryngoscopy and manipulation of the airway and, there is a high possibility of inducing hypoxia if the procedure takes too long to complete. Professionals will not attempt the procedure if they are certain it cannot be completed in thirty seconds or less. In victims who are conscious and who have an intact gag reflex, sedation and neuromuscular blocking agents are used prior to tube insertion.

Endotracheal tubes are produced in varying diameters and lengths (children to adult sizes) and with or without inflatable cuffs. They are available online, sold separately, and prices start at about \$7.00 each, plus shipping.

Open Cricothyrotomy

An open cricothyrotomy (also known as a tracheotomy) is a surgical procedure wherein a stoma (hole) is cut into the throat and a tracheostomy tube is then inserted into the trachea. Although not an absolute requirement, the use of a tracheal hook and a Trousseau tracheal dilator help to simplify the procedure.

At the beginning of this article, there was an example of a group member who went into anaphylactic shock after a hornet sting. A common occurrence with anaphylaxis is swelling of the tongue and throat, effectively closing off the airway and making the use of any of the afore mentioned adjuncts impossible. The open cricothyrotomy procedure is the only option available to open an airway for this victim. It is also the best shot for a victim who has suffered massive facial trauma and whose upper airway cannot be cleared of a major obstruction.

In the best case scenario, the use of a fast acting pain blocking agent (such as lidocaine) could provide some surgical procedure relief to the victim however, when seconds count, the pain of hypoxia (or death by asphyxiation) would be far worse than the pain caused during the procedure.

As is the case with the previously discussed artificial airway adjuncts listed under "advanced airway management," a tracheostomy tube can be connected directly to a bag valve mask device to assist in ventilating the victim.

A cricothyrotomy "kit" containing all the items needed to perform a tracheotomy (sans a dilator and hook) is available online for \$34.50 plus shipping through Tac Med Solutions. All other items discussed in this article are available through Amazon, eBay and other sellers.

Conclusion

We are preppers. We live by the motto, "pray for the best, prepare for the worst." Airway obstructions definitely qualify as one of the abject worst of the worst case situations we may encounter. Recognizing the various conditions, knowing the proper responses and having the equipment necessary to resolve airway issues will bring us that much closer to prepper perfection.

More detailed information can be found in the books, "Tactical Medicine Essentials" and "The Trauma Manual: Trauma And Acute Care Surgery."

