

Station: Video Laryngoscopy

Sugarloaf 2015 Airway Bootcamp

- Advantages of video laryngoscopy over traditional direct laryngoscopy
 - Magnifies view of airway and allows operator to perform tracheal intubation while watching video screen instead of looking in mouth (unequivocally provides better glottis visualization than standard DL)
 - Anterior angulation of blade and placement of video camera allows operator to see structure that would be difficult or impossible to see under direct vision.
 - VL can enhance education (others can visualize same anatomy operator is seeing)
 - Can record the procedure
- **Glidescope Video Laryngoscopy (GVL)**
 - A. Overview
 - VL with micro camera and Macintosh blade, LCD monitor, video cable
 - Attached to mobile stand or IV pole with C clamp
 - Laryngoscope portion of GVL consists of combined handle/laryngoscope
 - Video camera midway along undersurface of Laryngoscope blade to protect from secretions
 - Anti-fog mechanism around lens
 - *Three blades sizes:* Large (adult size), midsize (pediatric blade – toddlers to small adults), small (neonate to toddlers 1-2 yo)
 - B. Glidescope Cobalt (AVL single use)
 - Disposable one time version
 - Only two blade sizes available (large blade for adult patients, small blade for small adult/pediatric patients)
 - Blade slightly more anterior than original
 - C. Glidescope Ranger
 - Portable unit for field use
 - Transreflective 3.5 inch screen (to compensate outdoors in bright light)
 - Battery provides 90 minutes of use
 - Soft sided case
 - D. Strengths
 - Use for routine or as a device for difficult airways
 - Device's distal *angulation ideally suited to visualize anterior airway and intubate anterior larynx*
 - Useful when *c-spine immobilized* (doesn't require looking in oropharynx)
 - E. Technique
 - Only absolute contraindication is restricted mouth opening < 16 mm
 - 1. Insert in midline of tongue (do not sweep tongue left like traditional MAC DL – difficult to identify anatomic landmarks if off midline)
 - 2. Walk blade down past tongue and past uvula with a slight elevating motion until epiglottis is seen
 - 3. Advance to vallecula with some gentle upward force, to lift the epiglottis out of the way. The blade should be seated in the vallecula, much in the same way that a Macintosh blade would be (manufacturer also says can seat against posterior

surface of epiglottis). When positioned optimally, the glottis should be in the upper third of the view (allowing for working space to manipulate the tube)

4. Identifying and exposing the glottis is the easy part of using the GlideScope. The challenging part is directing the ETT toward the image of the glottis displayed on the video screen. Two reasons it is challenging:
 - a. Glidescope video camera is directed at an angle of 50 – 60 degrees and thus the angle of attack of the tube is quite steep
 - b. Using screen to navigate to the glottis requires some stereoscopic skill and hand-eye coordination that may not come naturally to all operators
5. The critical factor in getting the tube to enter the trachea is *configuring the ETT into a shape that conforms to that of the GlideScope blade before inserting* it into the patient's mouth, and for the operator to look directly into the mouth when inserting the tube, until the distal tip of the tube is felt to be in proximity with the distal end of the laryngoscope blade, at which time the eyes are redirected to the video screen to guide the tube through the glottis.
6. Options for bending the Laryngoscope blade:
 - a. Manufacturer recommended – gentle curve of 60 degrees (use preformed "GlideRite" rigid stylet (see figure 1 and 2) that provides appropriate curve and angle for the ETT to allow proper placement of the glottis opening).
 - b. Alternative approach is to bend tube at right angle just proximal to cuff, similar to configuration when using the trachlight. Tube inserted into right corner of mouth and rotated upward, at which point the tip of the tube should be pointing at the glottis. Gentle forward rotation of the tube on the apex of the bend will then allow the operator to align the tip of the tube perfectly with the glottis entrance. Then direct under video visualization (help to slightly withdraw stylet due to extreme angulation while simultaneously advancing the tube)
7. Also helpful to withdraw GVL 2 cm (causes larynx to drop down, lessens angle of attack and greatly facilitates advancement of tube)
8. Summary "Four Step Method for Glidescope Intubation"
 - a. Look into the mouth to introduce the blade
 - b. Look at the monitor to obtain the best view of the glottis
 - c. Look into the mouth to introduce the blade
 - d. Look at the monitor to guide the tube through the glottis

- **Storz Video Laryngoscope Intubating System - CMAC**

- A. Overview

- New C-MAC abandons fiberoptic and conventional video in favor of a CMOS micro video camera, which provides an enhanced field of view and resists fogging
 - Video recording system (supports both teaching and quality management)
 - Rechargeable lithium battery (90 minutes of power)
 - Blades based on specially modified conventional laryngoscope blades, so they do not require a specially curved stylet as is used with the Glidescope
 - Sizes 2,3,4 like traditional MAC blade
 - Straight Miller blades available for pediatric patients
 - "D-Blade" more sharply curved like GVL; intended to improve glottis visualization when larynx is high in the neck (anterior) or in other difficult laryngoscopy situations where there are limitations with the standard geometry of Macintosh – based curvatures

- May not be as good for anterior airways as the Glidescope blade
- Insertion of the tube usually easier than glidescope

B. Technique

1. Insert like a traditional Miller or Mac blade but tongue sweep not required
2. Operator views the uvula on screen and follows the midline until epiglottis comes into view
3. Blade then used in traditional fashion with blade placement either within the vallecula with anterior lift or under the epiglottis, both providing visualization of the glottis inlet.
4. The angle of attack is less acute than with the Glidescope and the tube is curved in a similar shape that used for conventional direct laryngoscopy.

- **Additional Educational Resources**

A. Video

1. Glidescope - <https://www.youtube.com/watch?v=7jb2tbqQ6VQ>
2. Storz CMAC - <https://www.youtube.com/watch?v=2enVYsjxXcQ>
3. Storz CMAC - https://www.youtube.com/watch?v=FVIDP_3kYbc

B. Verathon website (Glidescope) - <http://verathon.com/products/glidescope-video-laryngoscope>

C. Storz website (CMAC) - <http://www.karlstorz.com/cps/rde/xchg/SID-94686894-B30A27D1/karlstorz-en/hs.xsl/9549.htm>

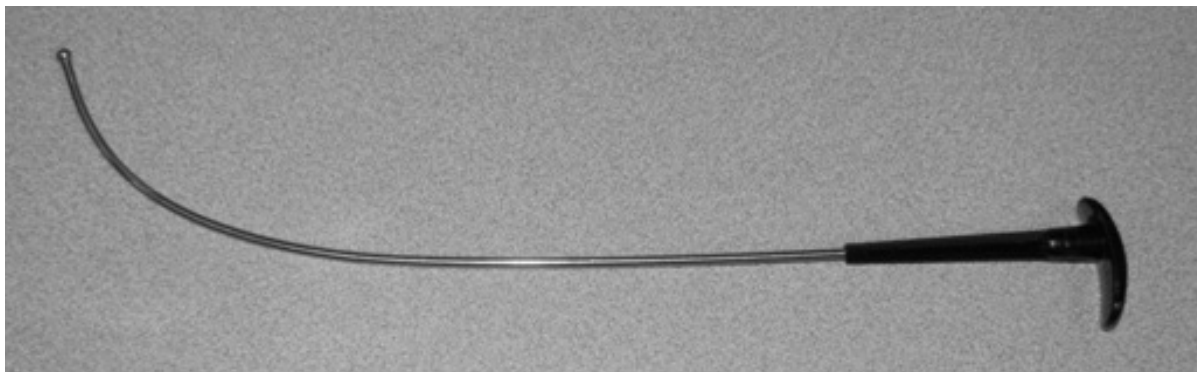


Figure 1. GlideRite Stylet



Figure 2. GlideRite Stylett configures ETT into a shape that conforms to that of the GlideScope blade.