

Video Laryngoscopy in the Field

Terence Valenzuela MD MPH
Tucson Fire Department





Short (Very) Hx of Laryngoscopy

- 1888 Alfred Kirstein first described direct visualization of the vocal cords
- 1913 Henry H. Janeway creates laryngoscope with a distal light source, batteries within the handle, a central notch in the blade, and a slight curve to the distal tip of the blade to help guide the tube through the glottis
- 1941 Robert A Miller invents the Miller lade
- 1943 Robert Reynolds Macintosh invents the Macintosh Blade
- Miller clan and Macintosh clan feud over patent rights from 1953 through to present



Why is
tracheal
intubation
with direct
laryngoscopy
so difficult?

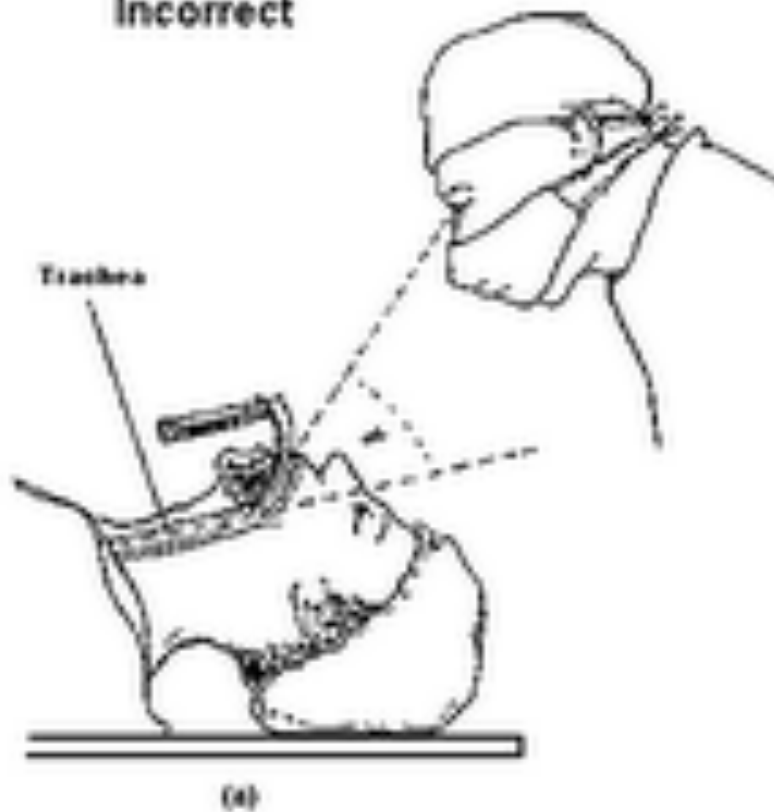




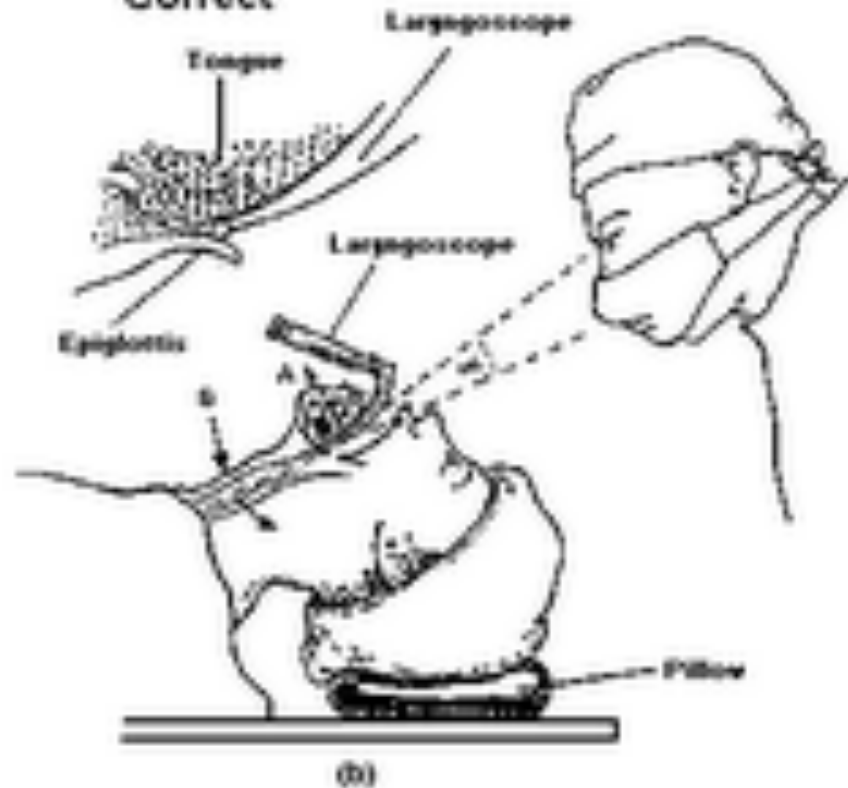


Line of sight from eye to glottis is required

Incorrect



Correct





The Classic Collector's Edition
**GRAY'S
ANATOMY**



780 illustrations, with 172 in color



Challenging Anatomy





Video Laryngoscopy

- Laryngoscope with a video camera on the blade that transmits real-time images of the glottis to an external monitor.
- Tracheal intubation performed viewing monitor screen rather than viewing directly through the mouth

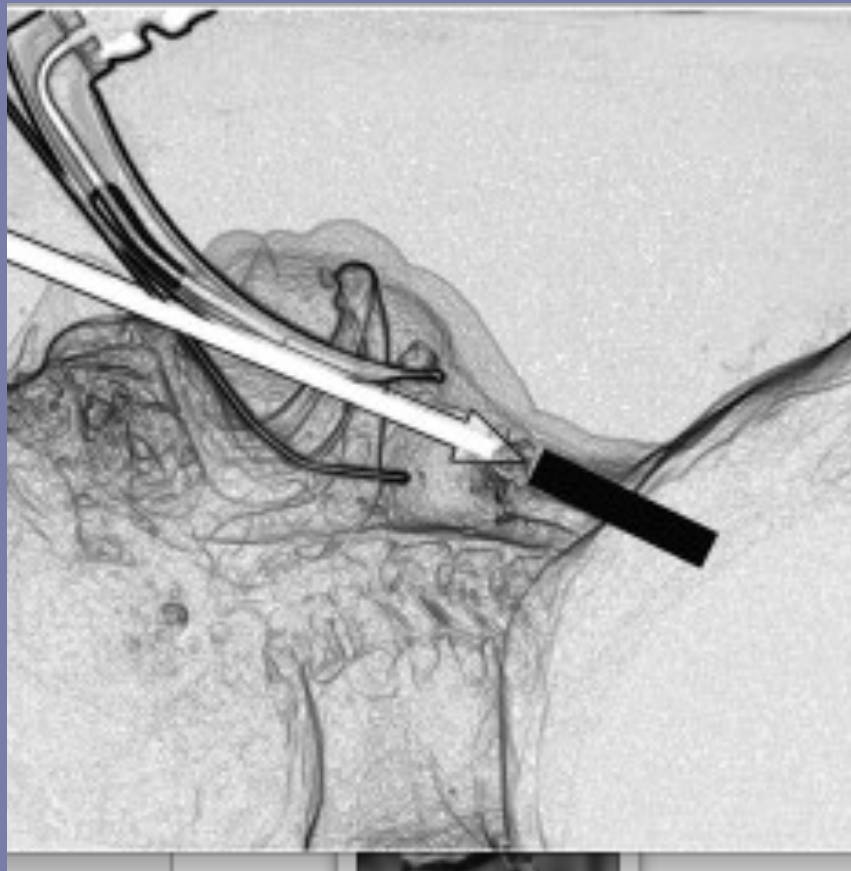


Advantages of VL in Tracheal Intubation

- Direct line of sight not required
- Can see around the tongue
- Structures are magnified
- Less deterioration of image by body fluids (blood, vomit, sangria)

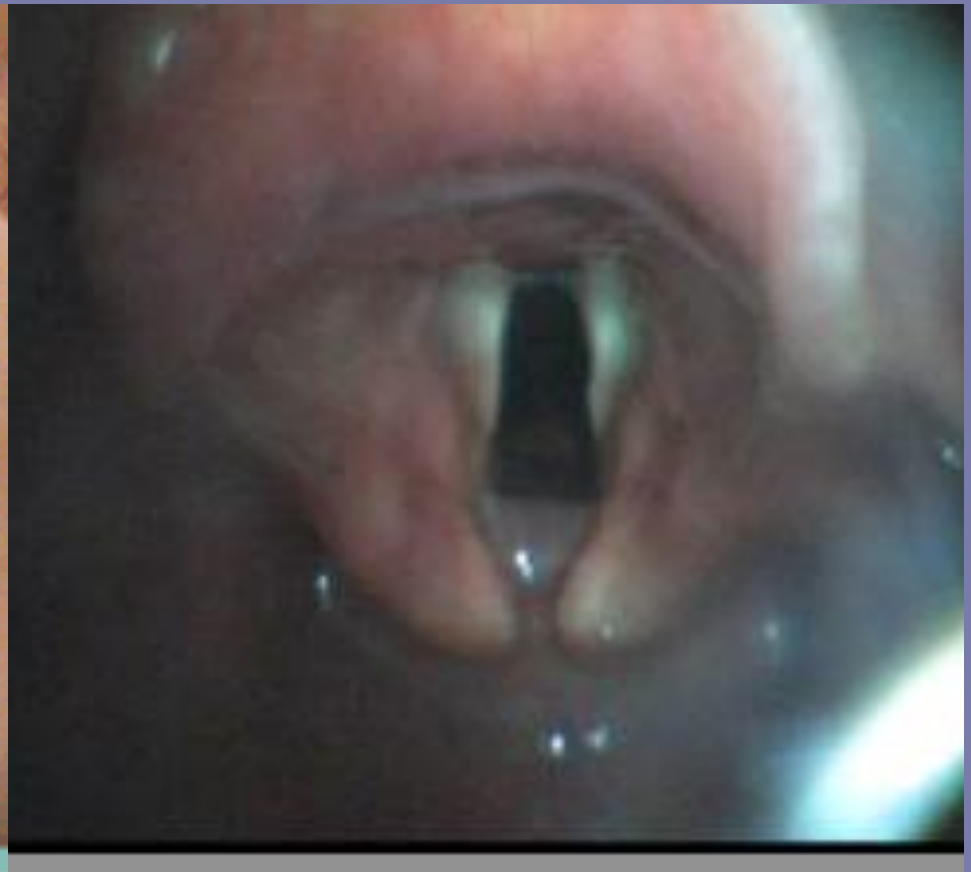
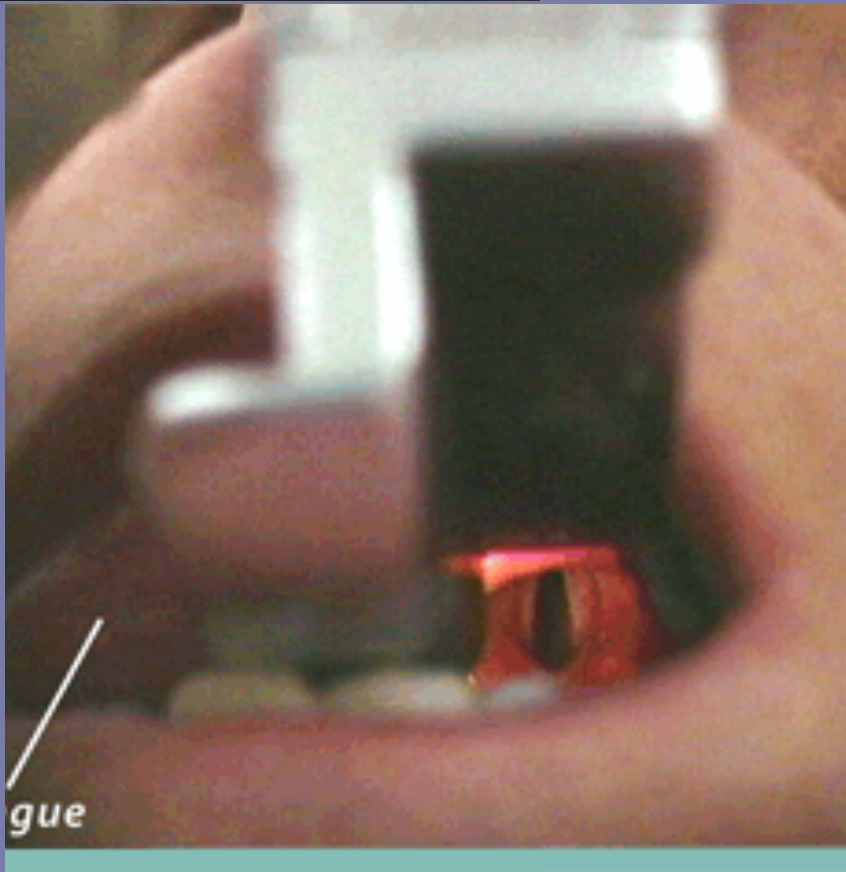


Camera Image Behind the Tongue





Structures Magnified

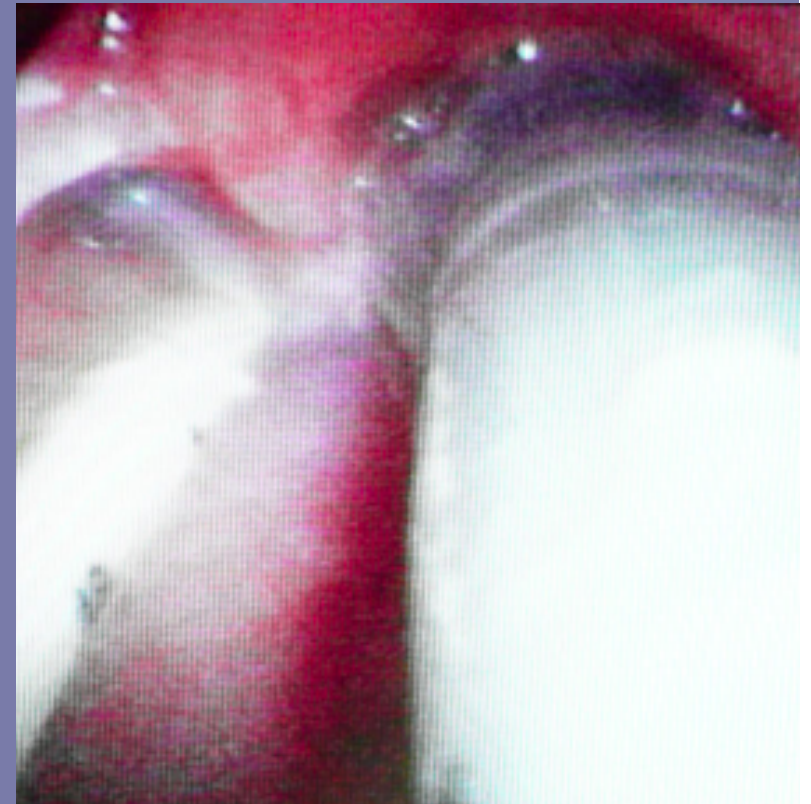
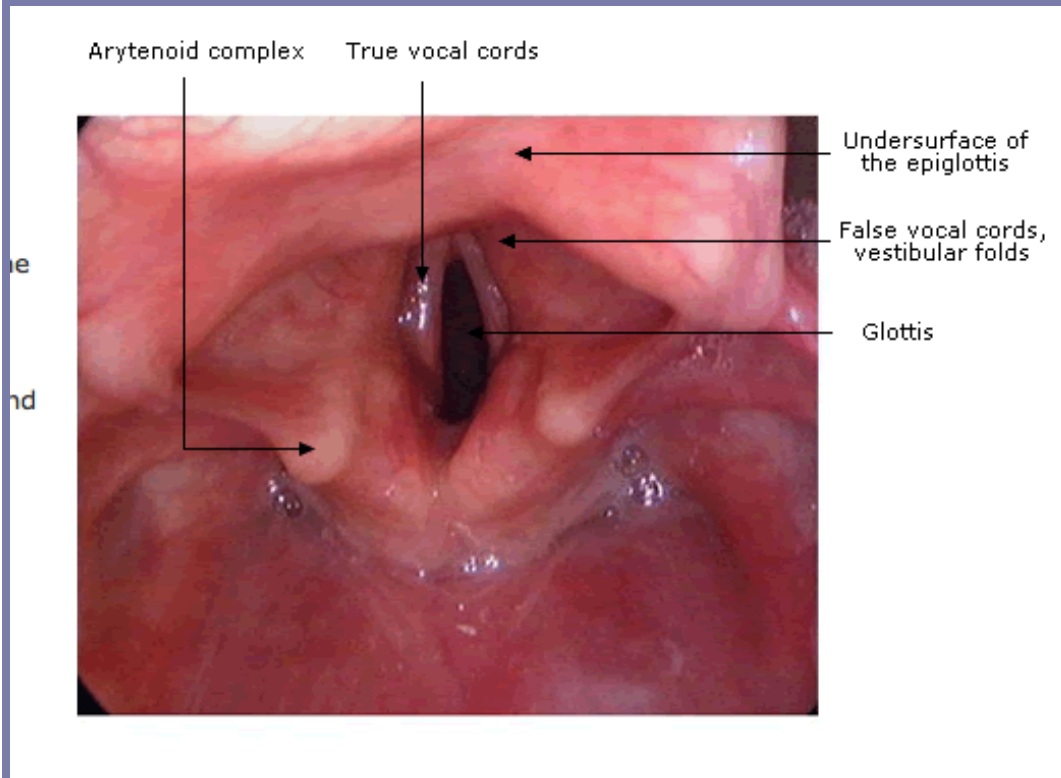




Disadvantages of VL

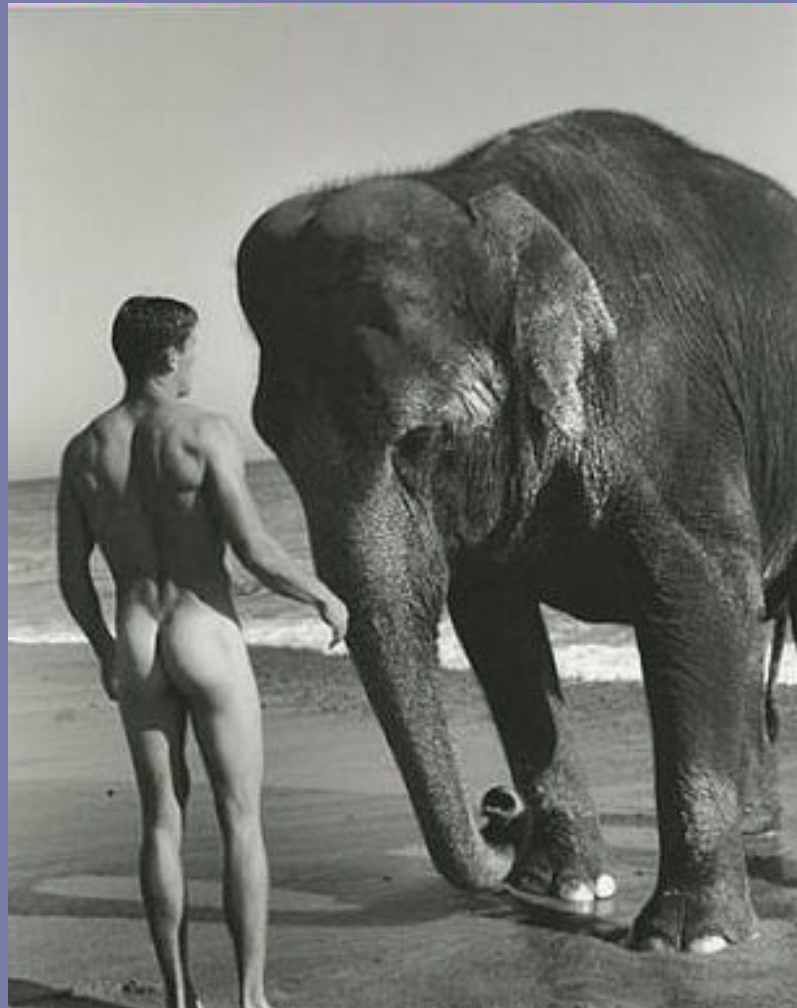
- Different technique for more angulated blades of VL
- More or less retraining necessary
- Maneuvering endotracheal tube to target (glottis) more or less different/difficult because of steeper approach
- Stylets match “bend” of VL blade

Steeper Angle of Attack





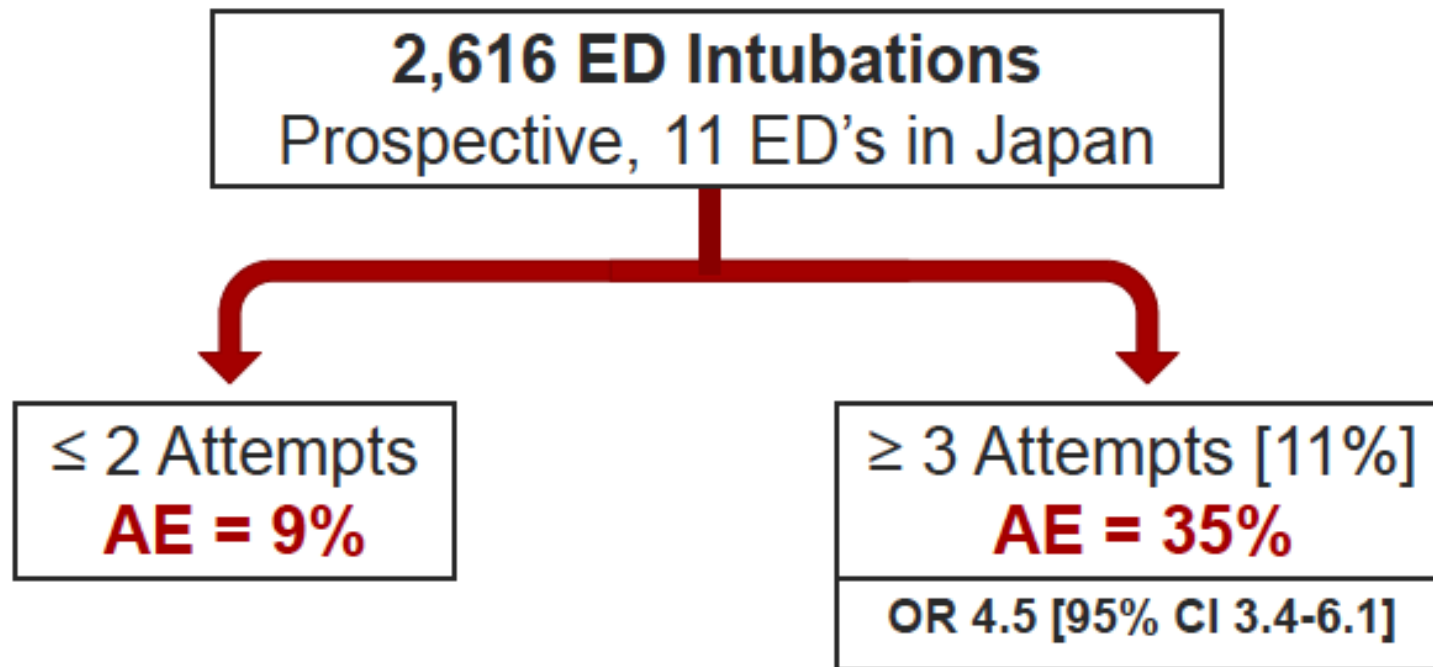
Does it pick up
peanuts?
(does it work?)





Hasegawa K Association between repeated intubation attempts and adverse events in emergency departments. Ann Emerg Med. 2012 Dec;60(6):749-754.

Intubation Attempts & Adverse Events



Adverse Events [AE]

Hypoxemia, hypotension, dysrhythmia, cardiac arrest, aspiration, unrecognized esophageal intubation, RMS intubation, airway injury.



Sakles JC A comparison of the C-MAC video laryngoscope to the Macintosh direct laryngoscope for intubation in the emergency
Ann Emerg Med. 2012 Dec;60(6):739-48

ED
Intubations
750

Macintosh
DL
Successful
418/495
84%
95% CI [81%,
87%]

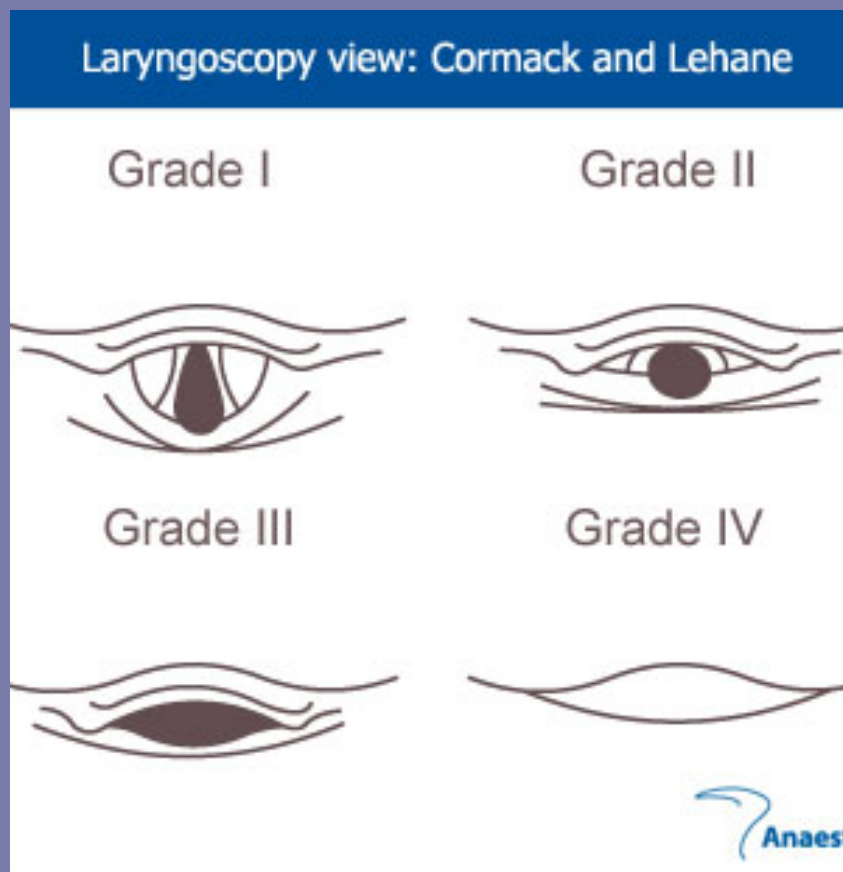
C-MAC
VL
Successful
248/245
97%
95% CI [94%,
99%]



Sakles JC
Ann Emerg Med. 2012
Dec;60(6):739-48

CMAC vs Macintosh

- Grade I or II view obtained:
117/125 **93%**; 95%
CI (88%,97%) vs
410/495 **83%**; 95%
(79%,86%).
- First-attempt success
(odds ratio 2.2; 95% CI
1.2 to 3.8)



Device	Name	Company	Power Source	Cost
	GlideScope Ranger	Verathon	Rechargeable	\$\$\$
	C-MAC PM	Karl Storz	Rechargeable	\$\$
	Pentax AWS	Pentax Medical	AA Batteries	\$\$\$
	King Vision	King Systems	AAA batteries	\$
	McGrath Series 5	McGrath	AA battery	\$\$



References

- Hasegawa K **Association between repeated intubation attempts and adverse events in emergency departments.** Ann Emerg Med. 2012 Dec; 60(6):749-754.
- Sakles JC **A comparison of the C-MAC video laryngoscope to the Macintosh direct laryngoscope for intubation in the emergency** Ann Emerg Med. 2012 Dec;60(6):739-48



Mobile Integrated Healthcare Network, Screen Door Manufacturing and Communal Living Experiment





Concerning Code 3: Burt and Edna
slam on the brakes and are rear-
ended by six vehicles

