



Zabezpečenie dýchacích ciest

doc. MUDr. Jozef Firment, PhD.

I. klinika anestéziológie a intenzívnej medicíny UPJŠ LF a UNLP
Košice

Účel pre použitie pomôcok...

- Udržanie priechodnosti DC
 - Pri spontánnom dýchaní
 - Pri riadenom dýchaní
- Interface pre napojenie pomôcok a prístrojov 15/22 mm

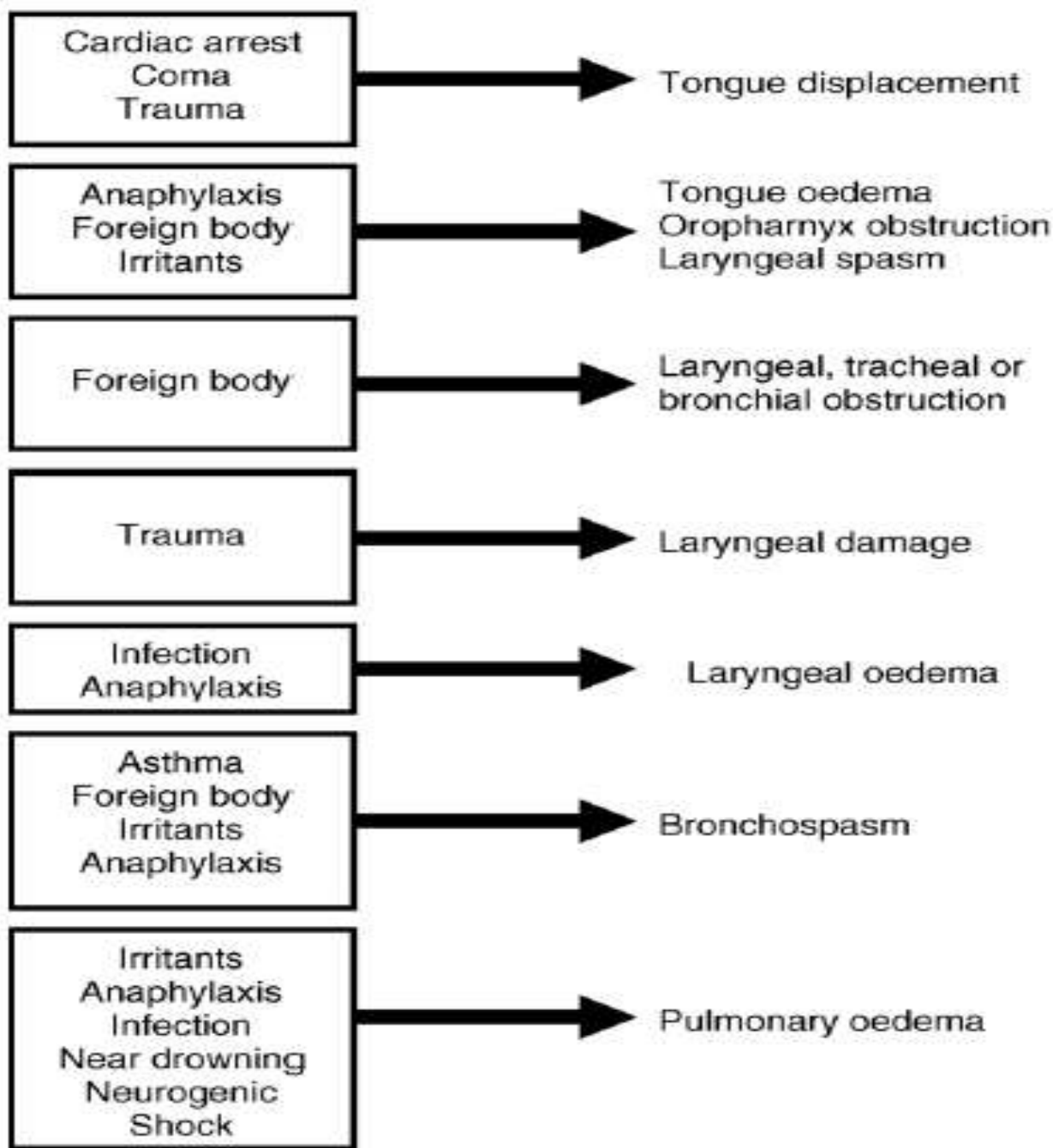


Figure 4.3 Causes of airway obstruction.



SPRIECHODNENIE DÝCH. CIEST ZÁKLONOM HLAVY

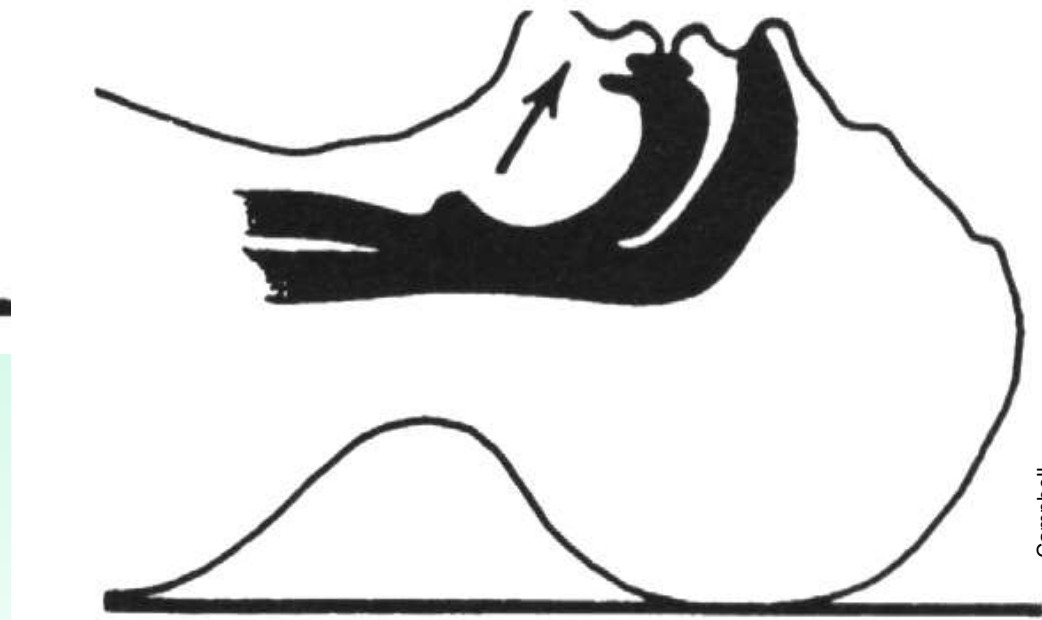
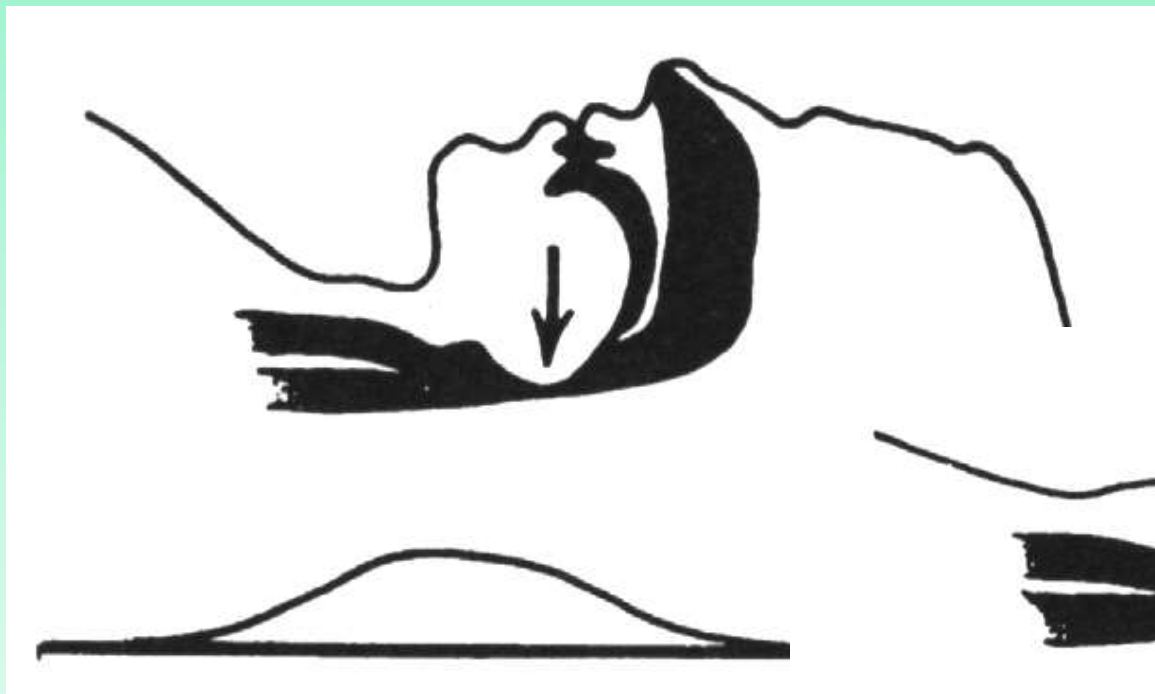




Figure 4.4 Head tilt and chin lift. © 2005 European Resuscitation Council.

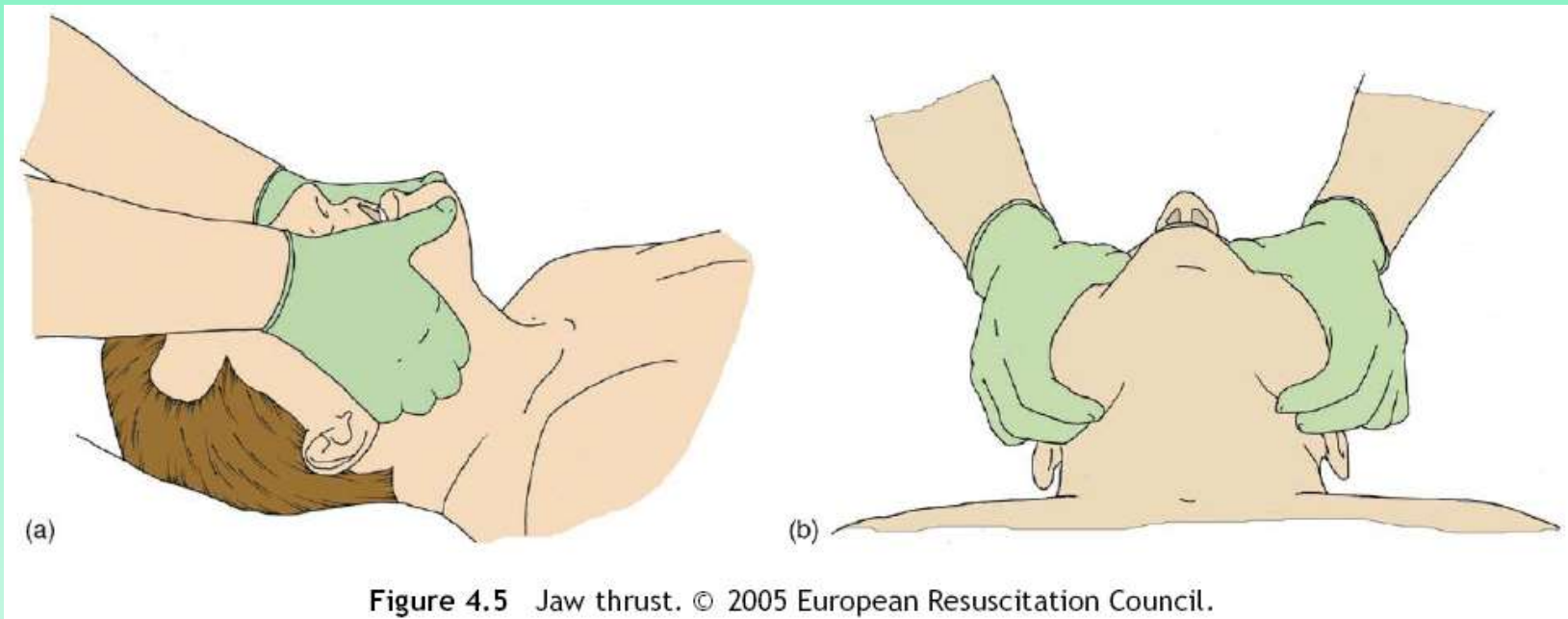


Figure 4.5 Jaw thrust. © 2005 European Resuscitation Council.

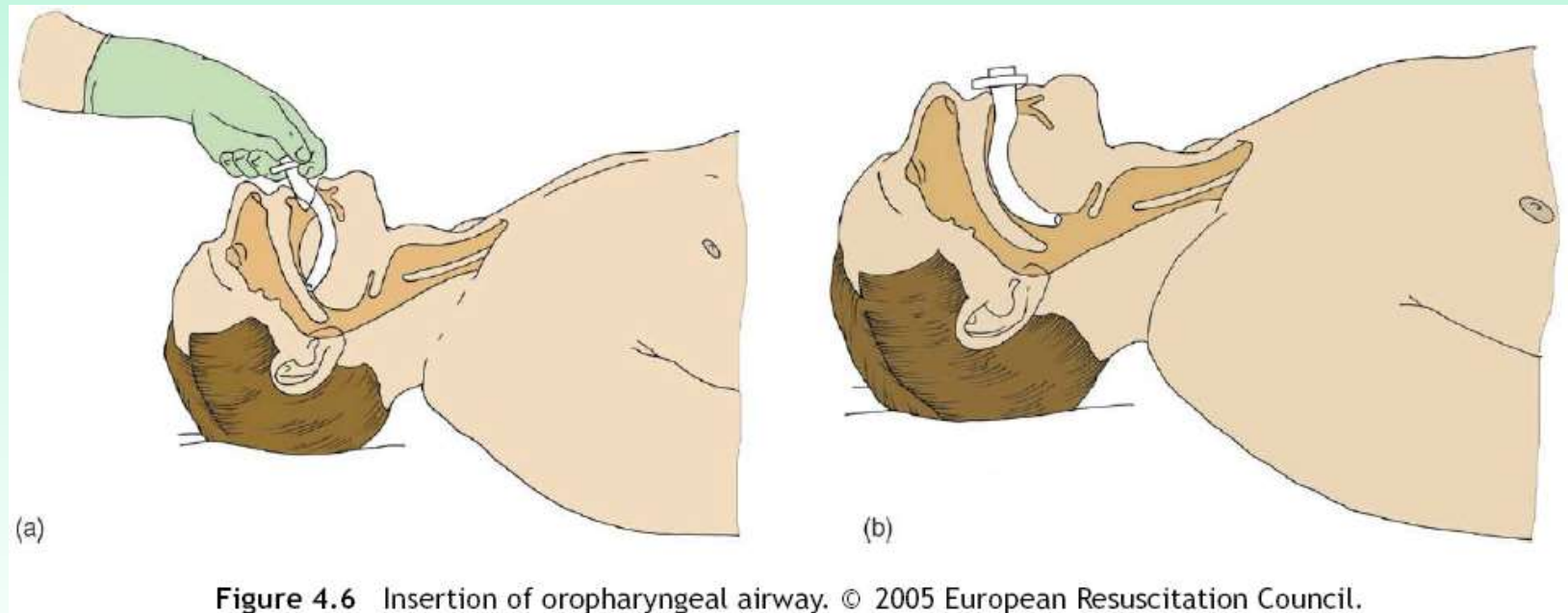
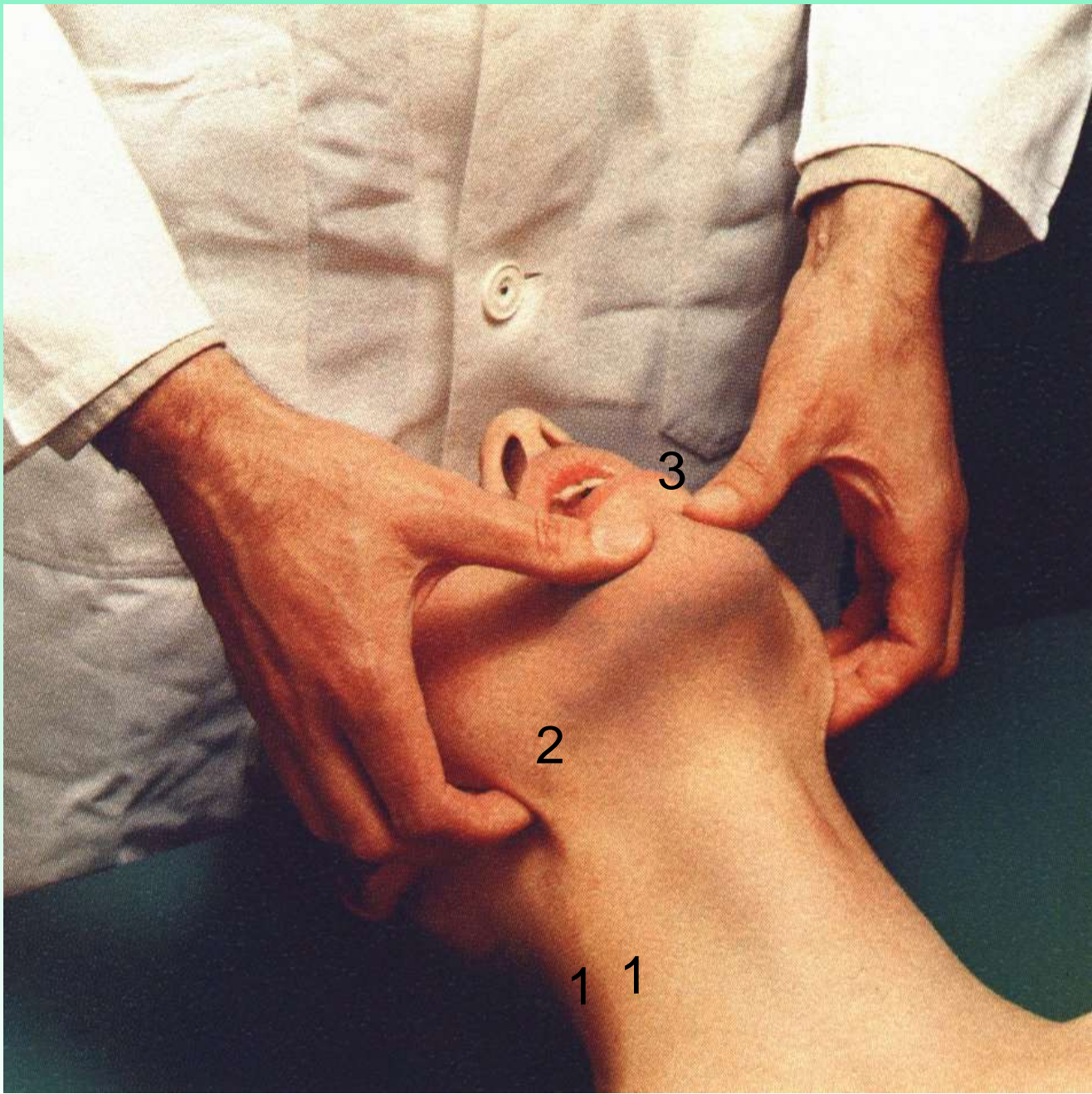


Figure 4.6 Insertion of oropharyngeal airway. © 2005 European Resuscitation Council.



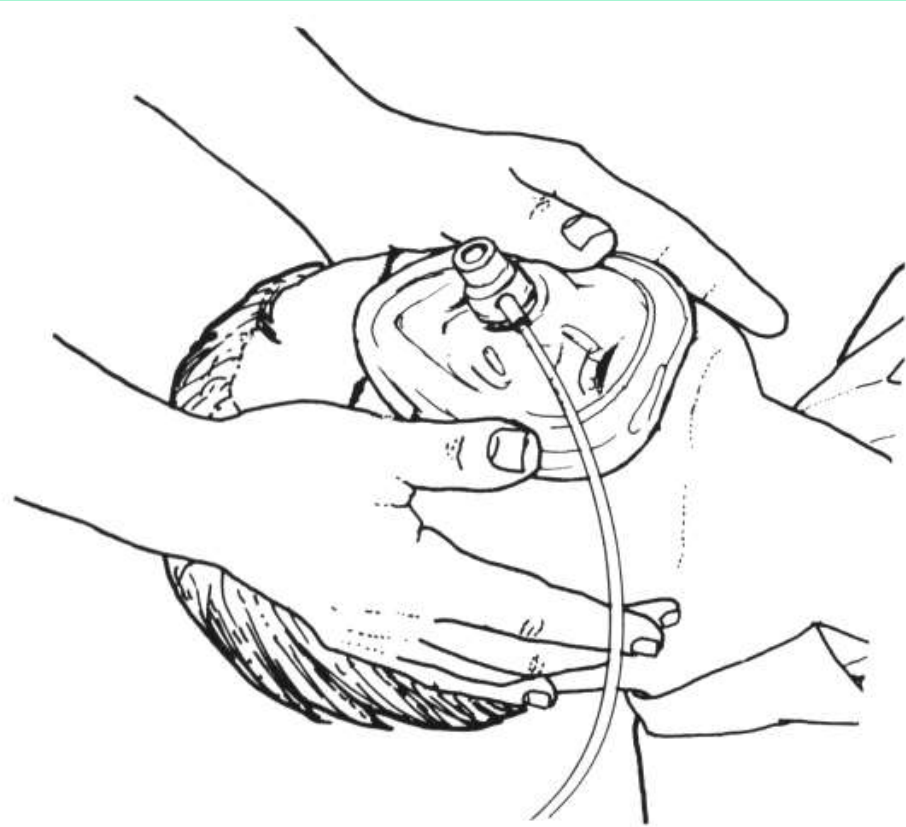
ESMARCHOV 3-HMAT



Heimlichov manéver



ESMARCHOV HMAT A TVÁROVÁ MASKA



Eubanks & Bone 1994



Figure 4.7 Mouth-to-mask ventilation. © 2005 European Resuscitation Council.

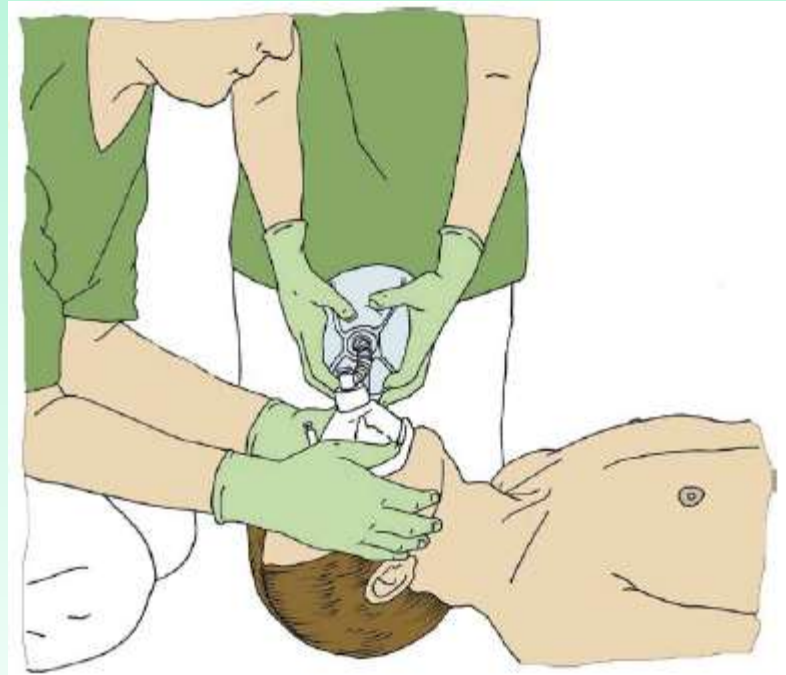
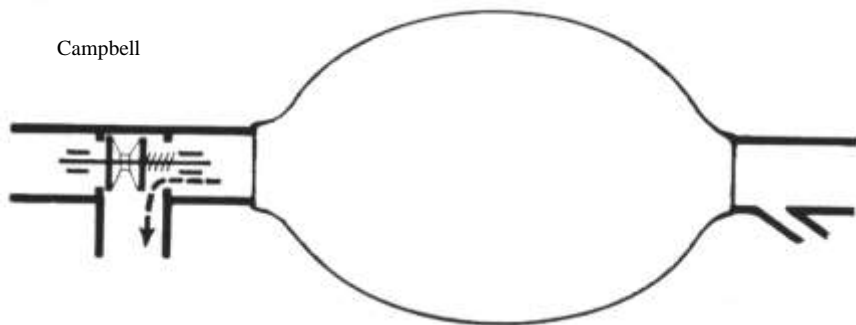


Figure 4.8 The two-person technique for bag-mask ventilation. © 2005 European Resuscitation Council.

MANÉVER SKRÍŽENÝCH PRSTOV



Campbell



dospelí:

- " -

deti

- " -

O₂
l/min

13

4

5

2

FiO₂
%

85-100

>40

85-100

>40

V_T x f

1000 x 15

dtto

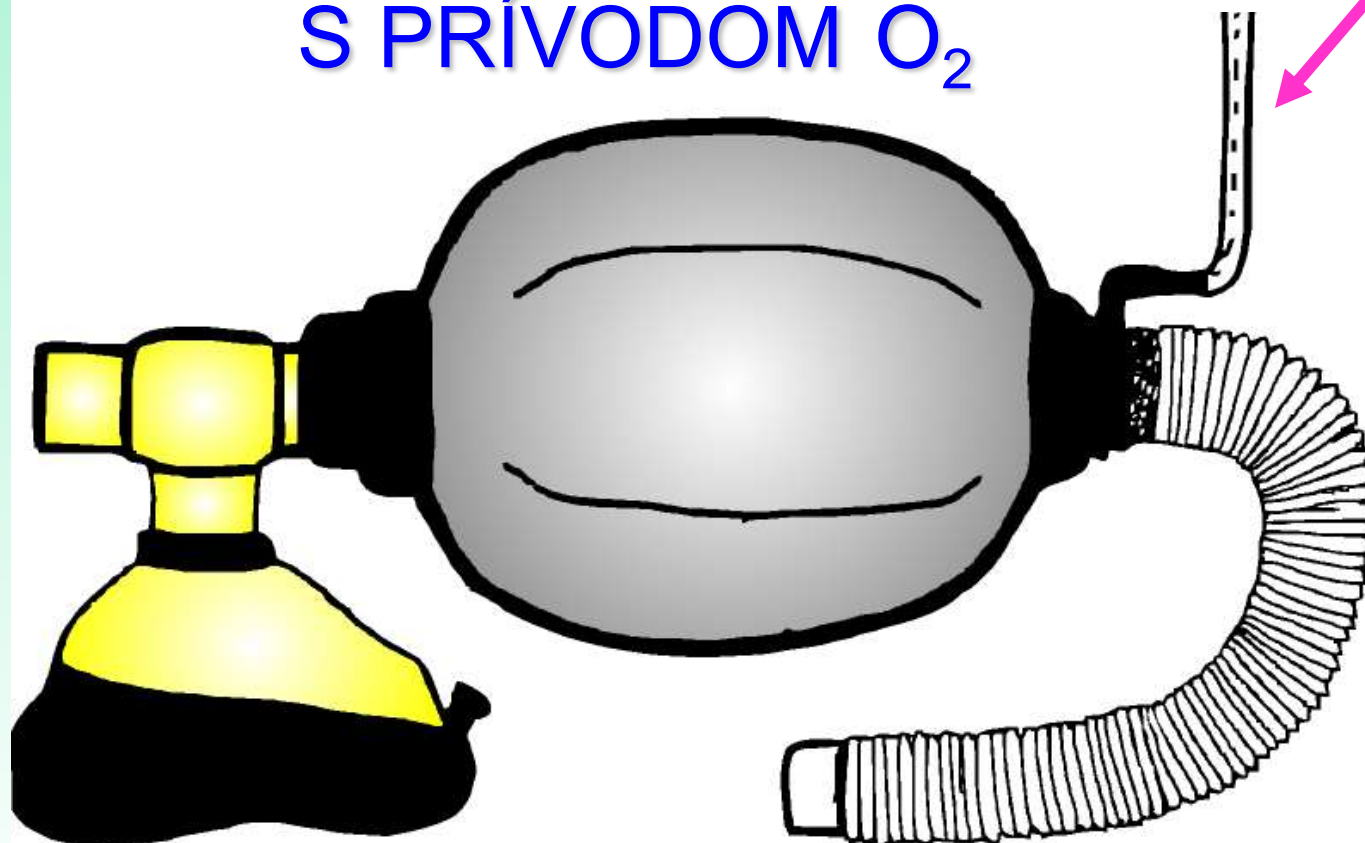
300 x 20

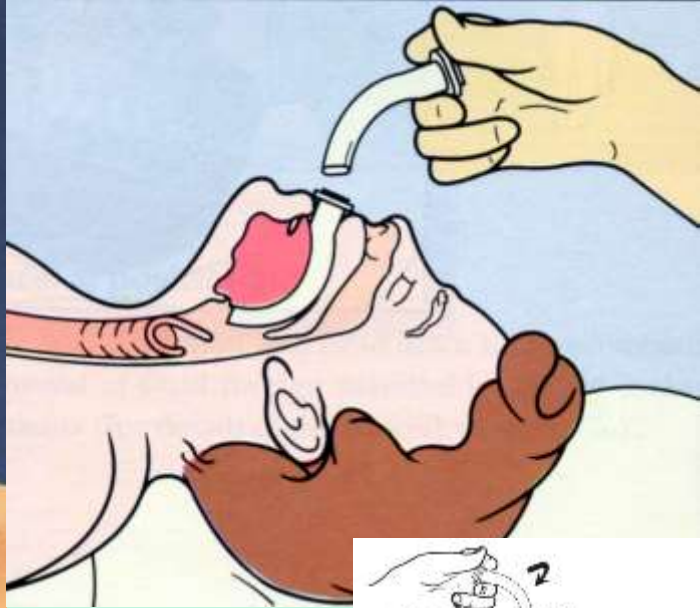
dtto



SAMOROZPÍNACÍ VAK S PRÍVODOM O₂

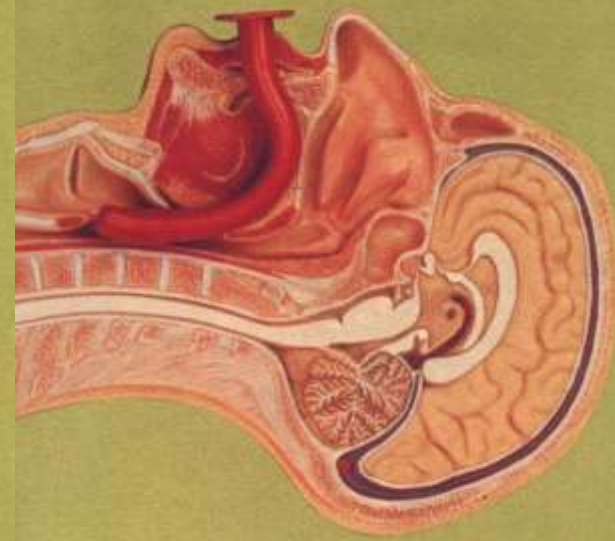
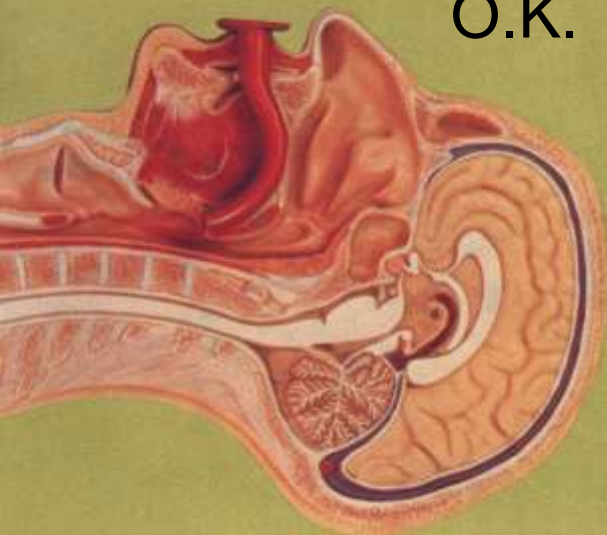
Prívod O₂
10 - 13 l/min





ÚSTNY VZDUCHOVOD

O.K.



HODNOTENIE ŤAŽKOSTÍ PRI INTUBÁCII



CORMACK - LEHANE



Grade I



Grade II

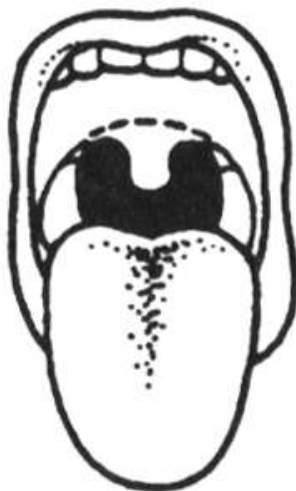


Grade III



Grade IV

MALLAMPATTI



Class 1



Class 2



Class 3



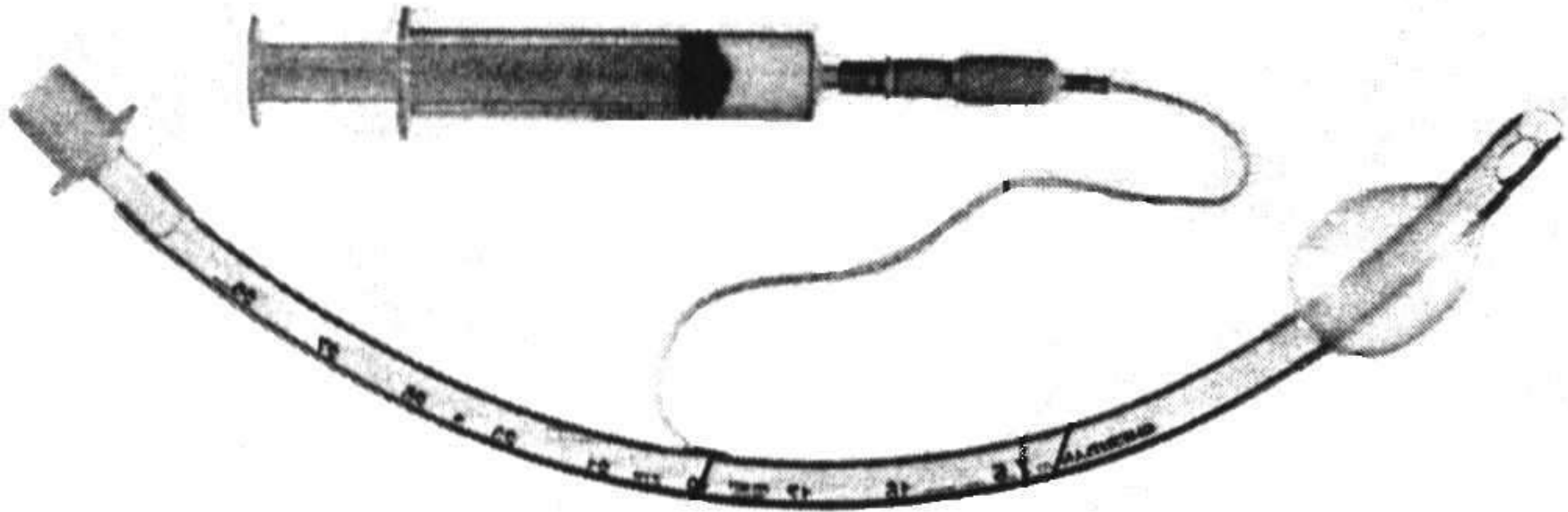
Class 4

ENDOTRACHEÁLNA KANYLA



striekačka

kontrolný balónik



obturačná manžeta

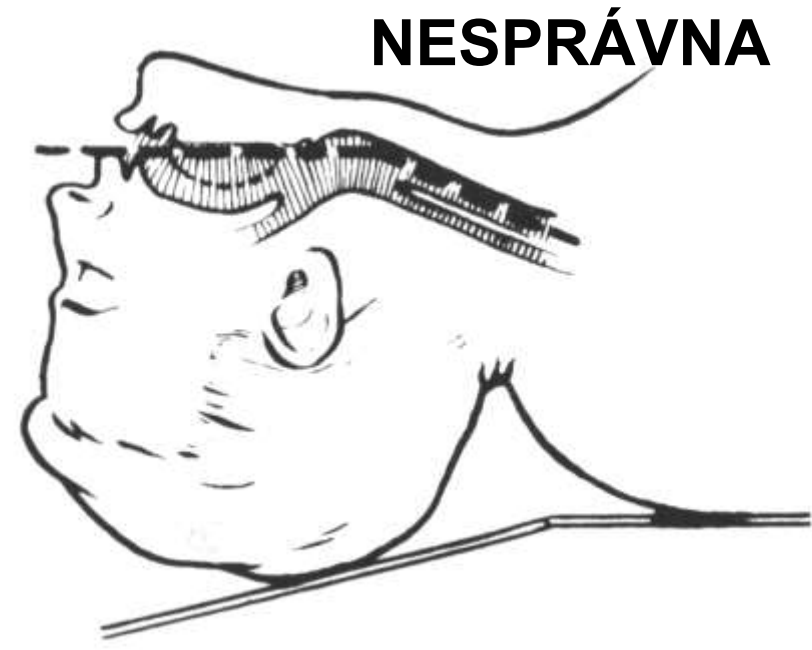
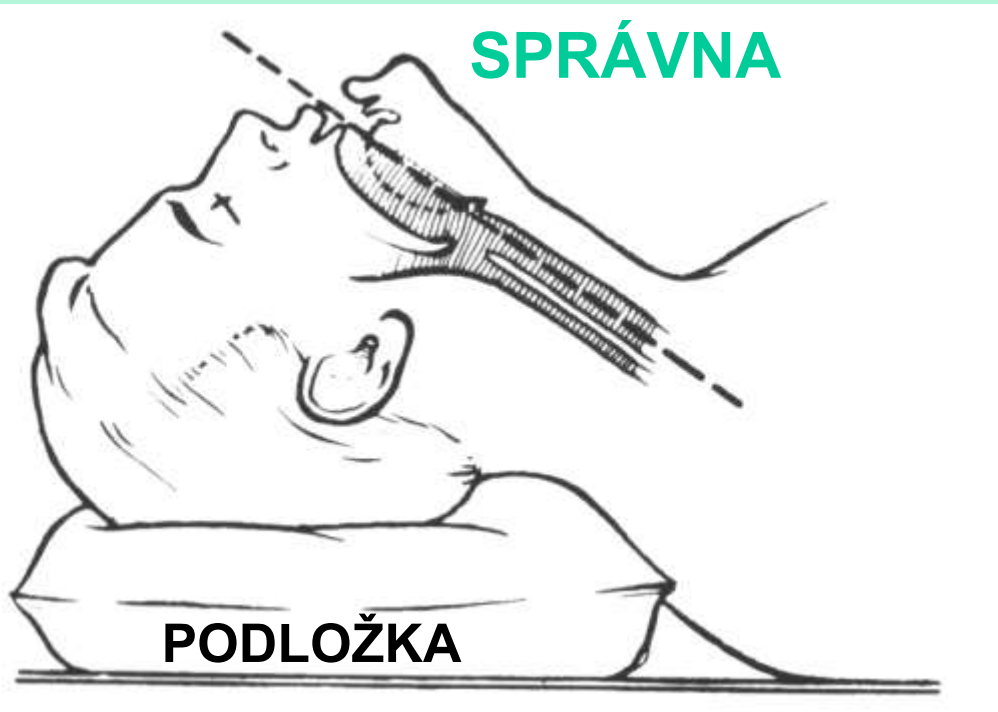
Endotracheal Tube Cuffed



Endotracheal Tube Plain



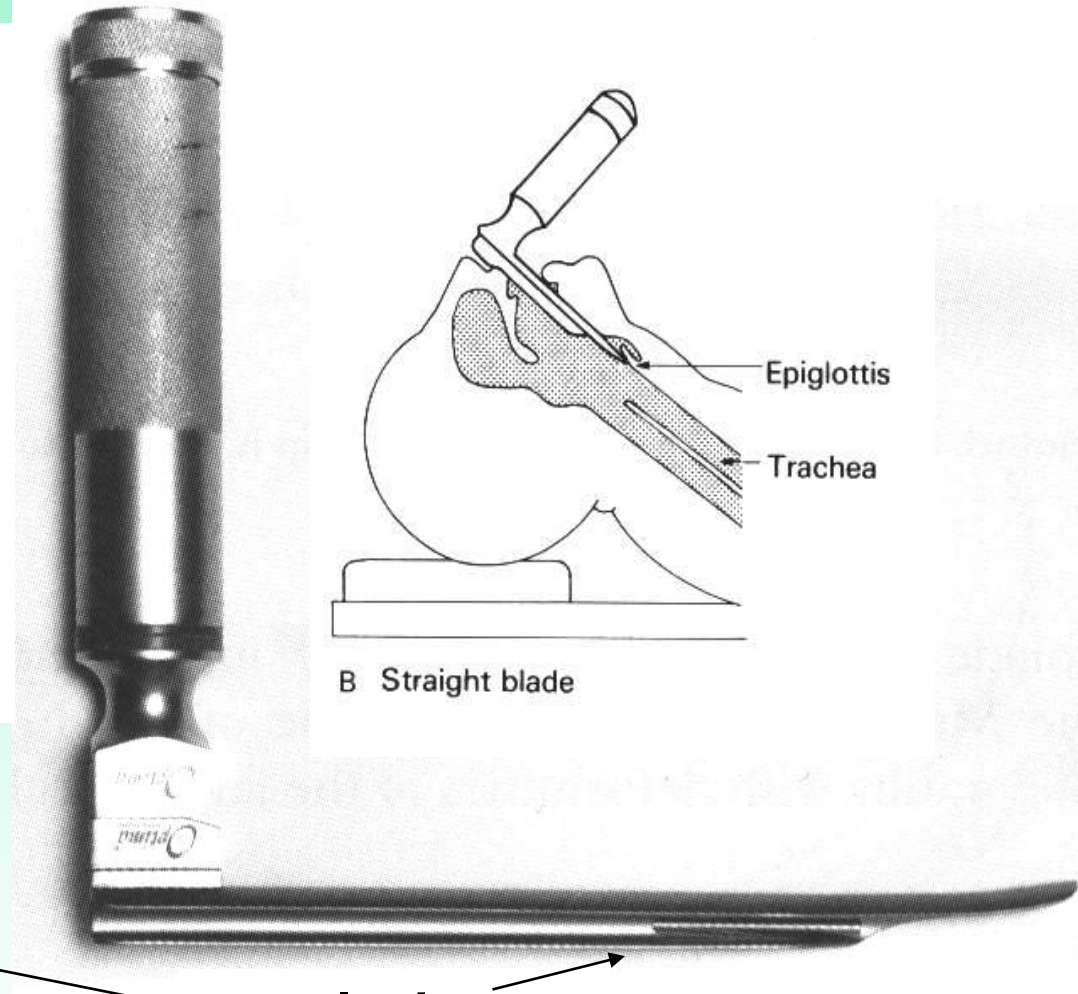
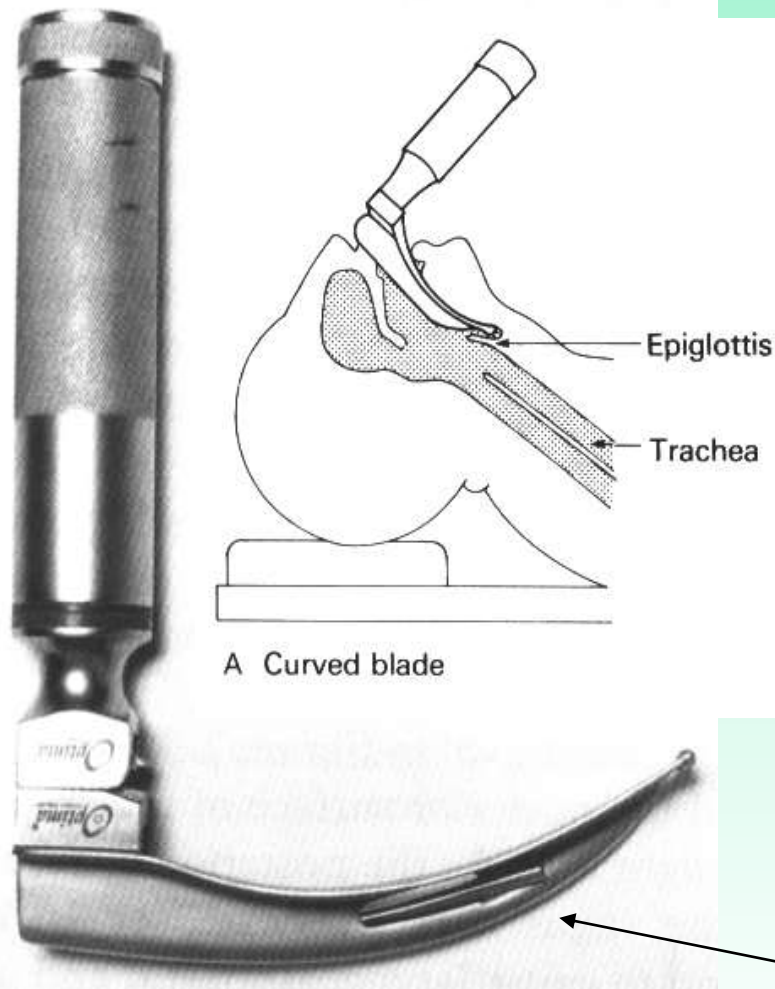
POLOHA HLAVY PRI ENDOTRACHEÁLNEJ INTUBÁCII



PRIAMA LARYNGOSKÓPIA

MACINTOSH

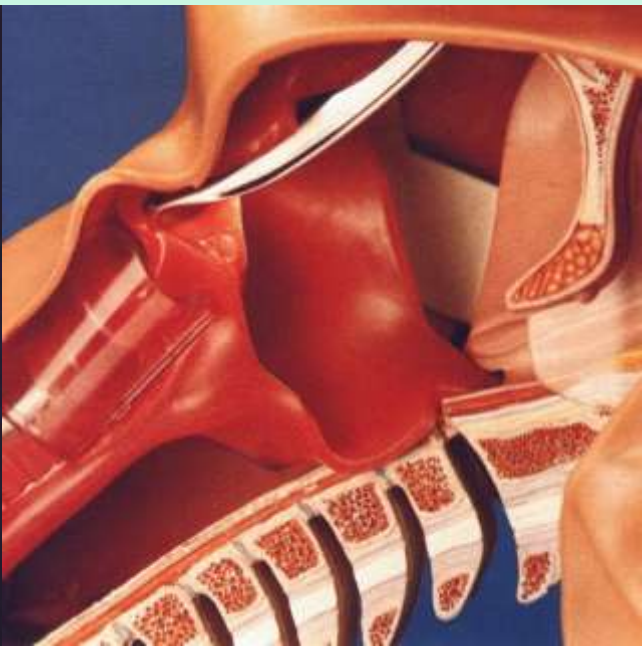
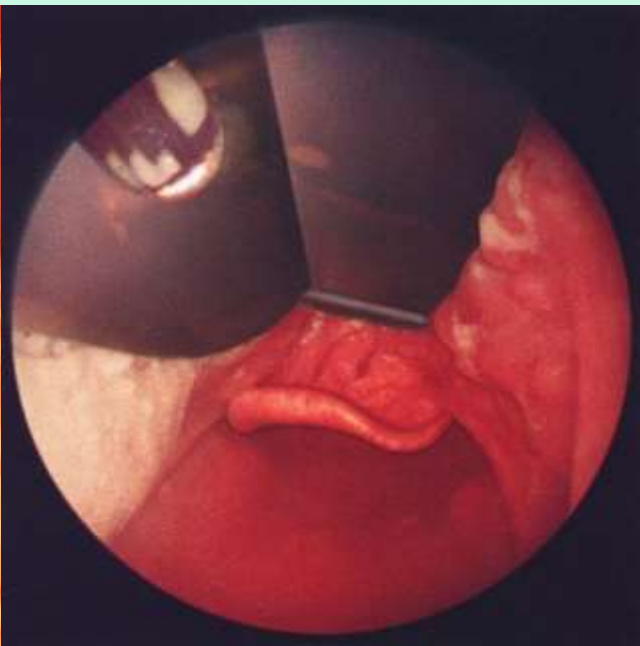
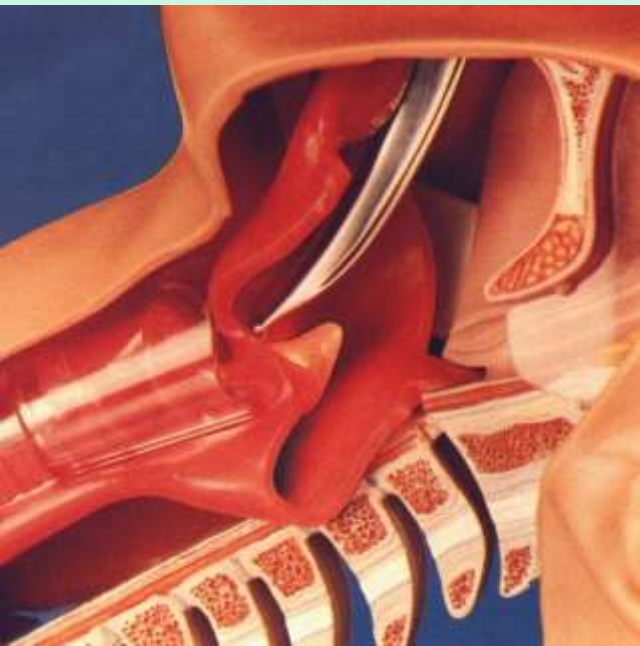
MAGILL

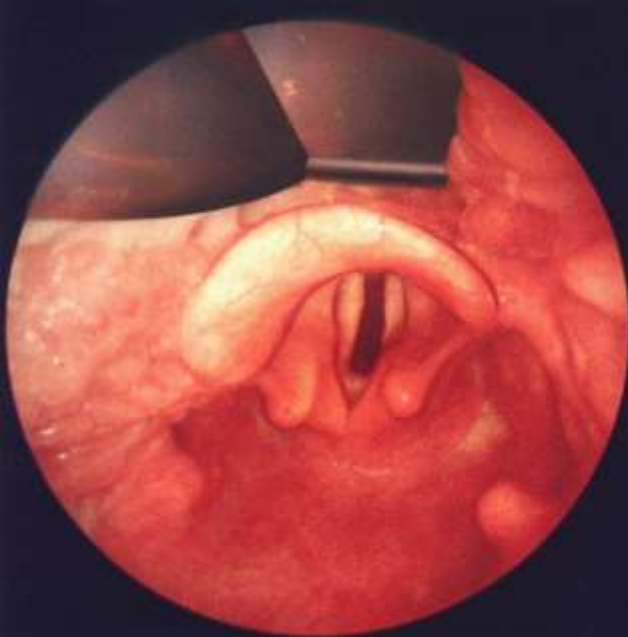


osvetlenie



OROTRACHEÁLNA INTUBÁCIA 1/2

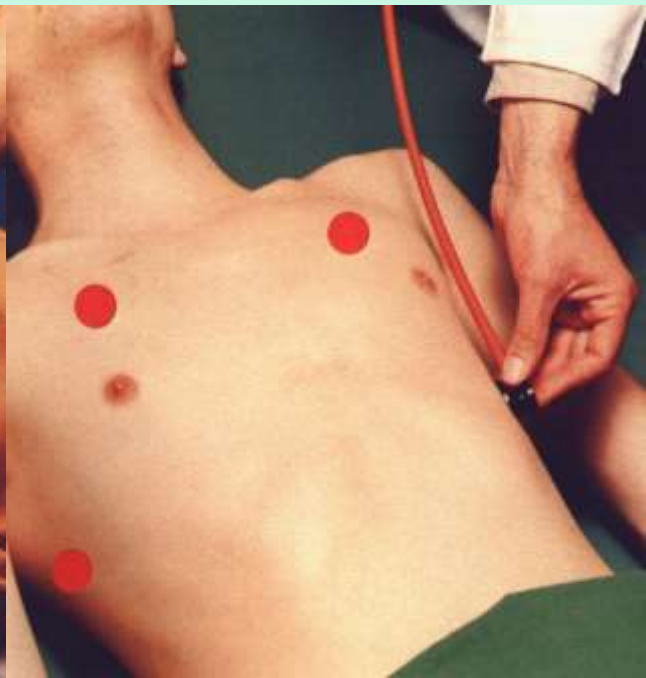


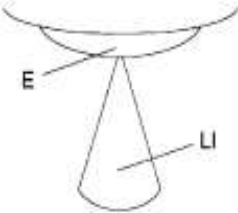






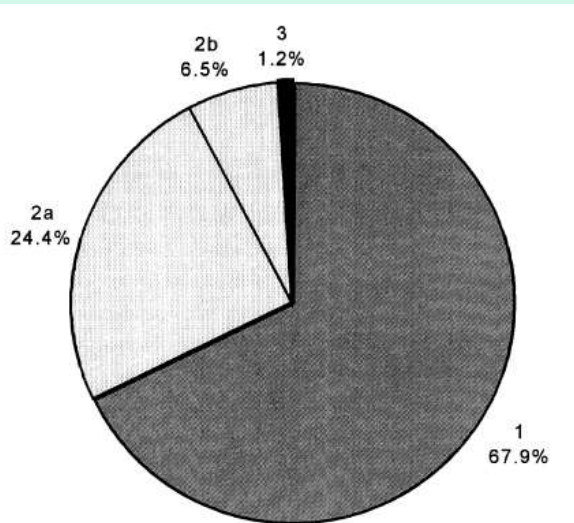
OROTRACHEÁLNA INTUBÁCIA 2/2



17-25 cmH₂O



Original Cormack and Lehane system	1	2		3	4
	Full view of the glottis	Partial view of the glottis or arytenoids		Only epiglottis visible	Neither glottis nor epiglottis visible
View at laryngoscopy					
Modified system	1 As for original Cormack and Lehane above	2a Partial view of the glottis	2b Arytenoids or posterior part of the vocal cords just visible	3 As for original Cormack and Lehane above	4 As for original Cormack and Lehane above



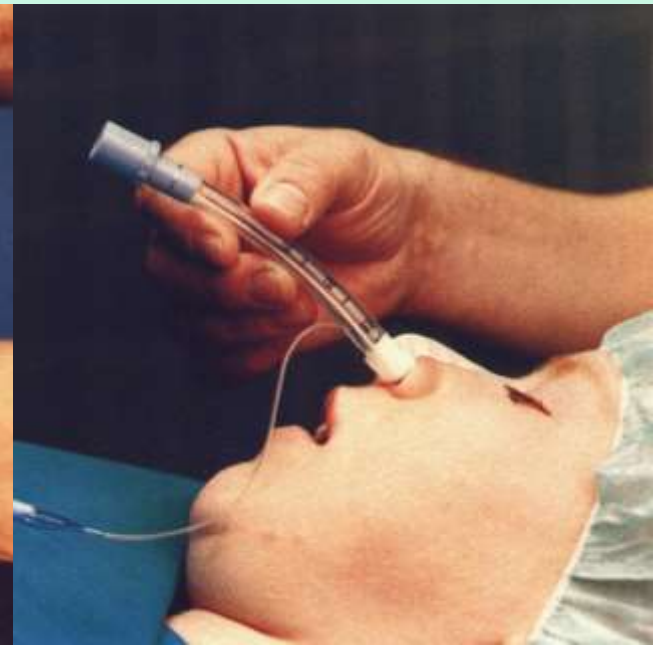
CORMACK - LEHANE

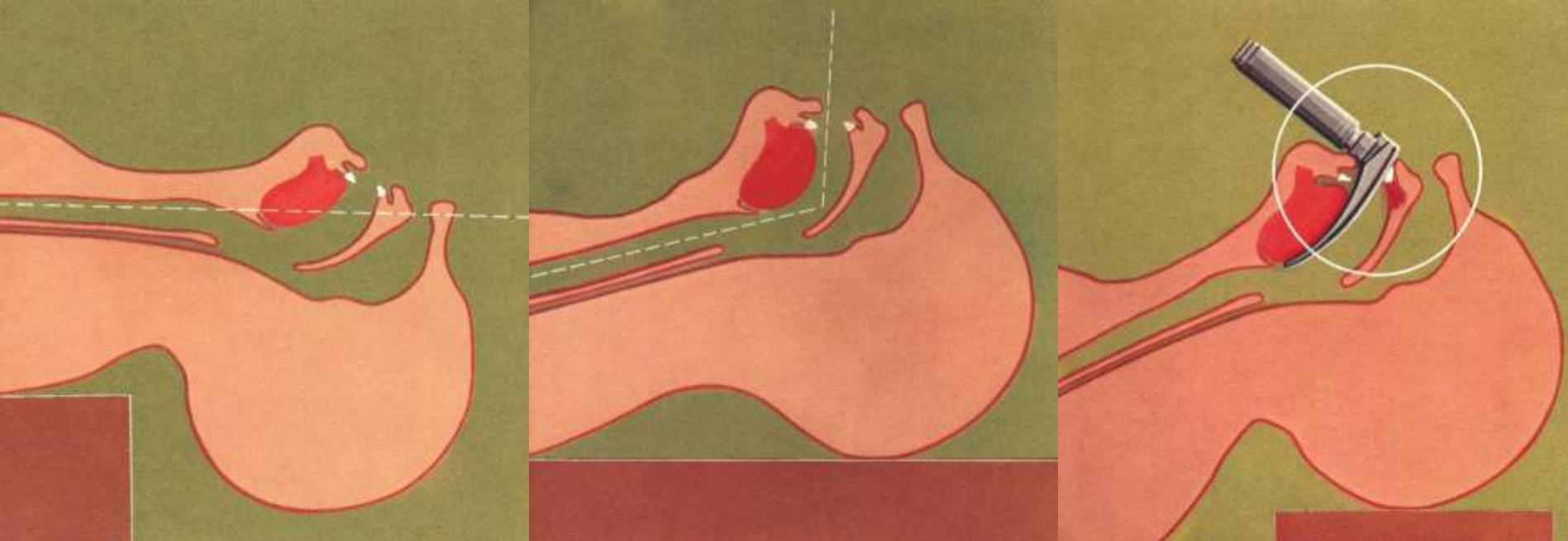
Yentis S.M., Lee D.J.H.:

Grading of direct laryngoscopy Anaesthesia, 1998, **53**, pages 1041–1044

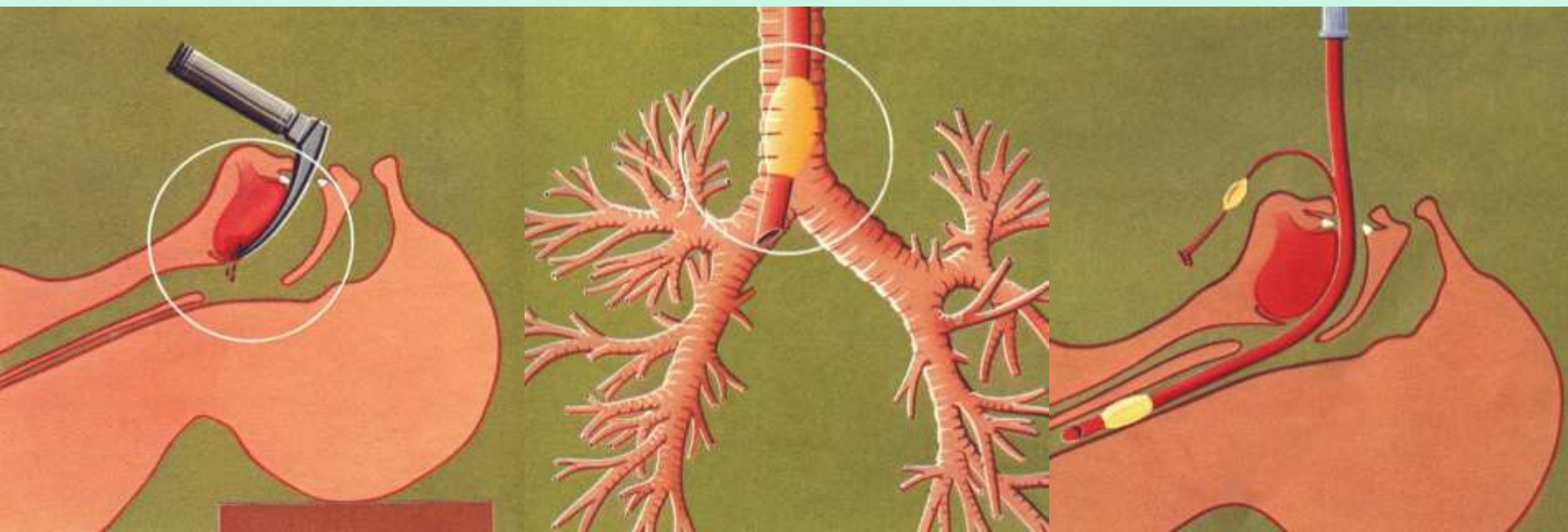


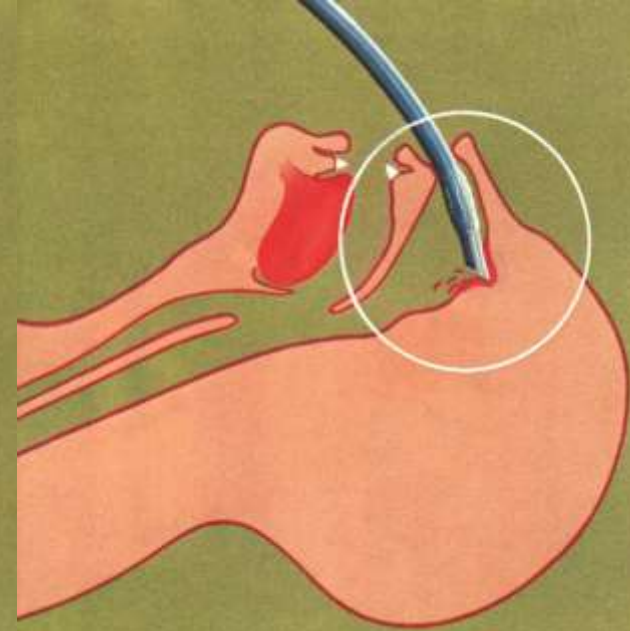
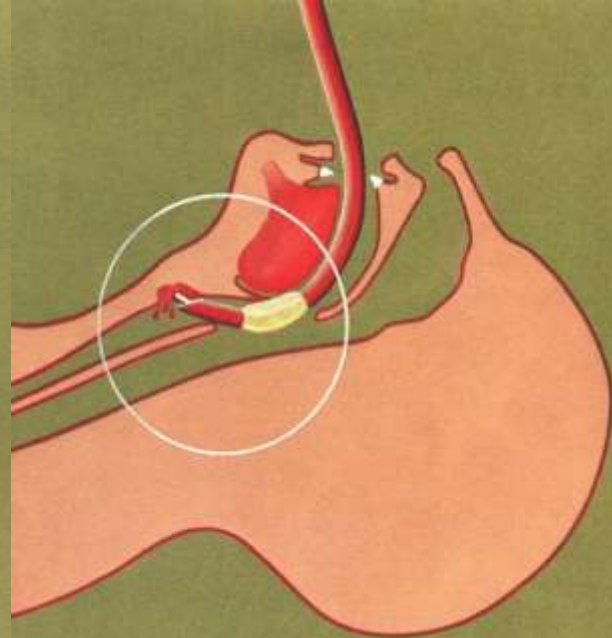
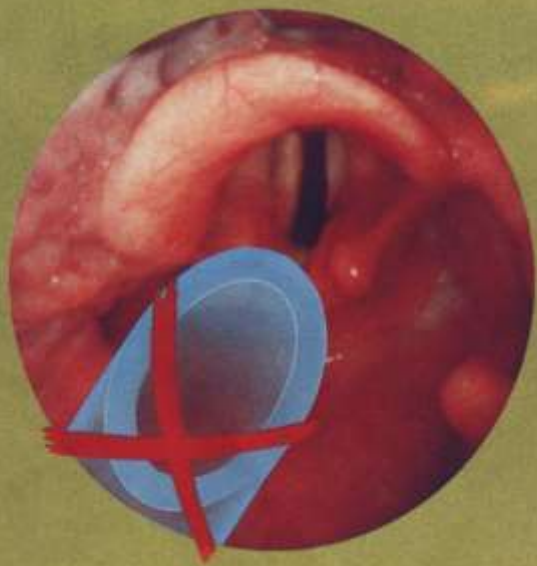
NASOTRACHEÁLNA INTUBÁCIA



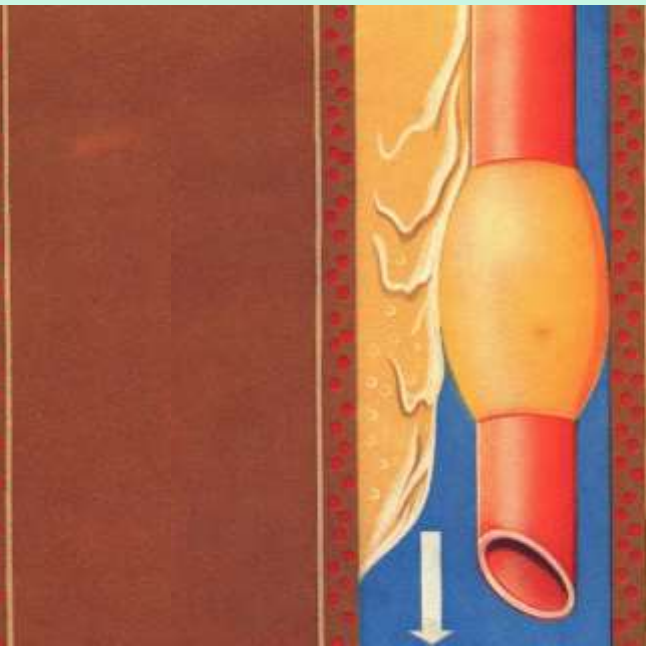
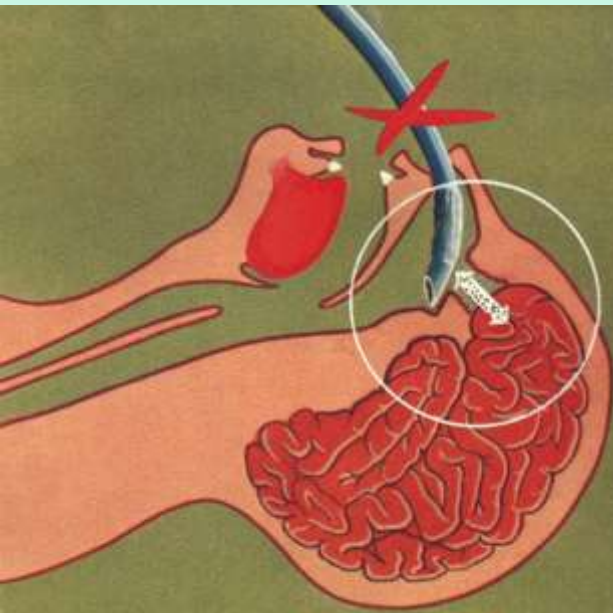


PROBLÉMY A KOMPLIKÁCIE 1/3



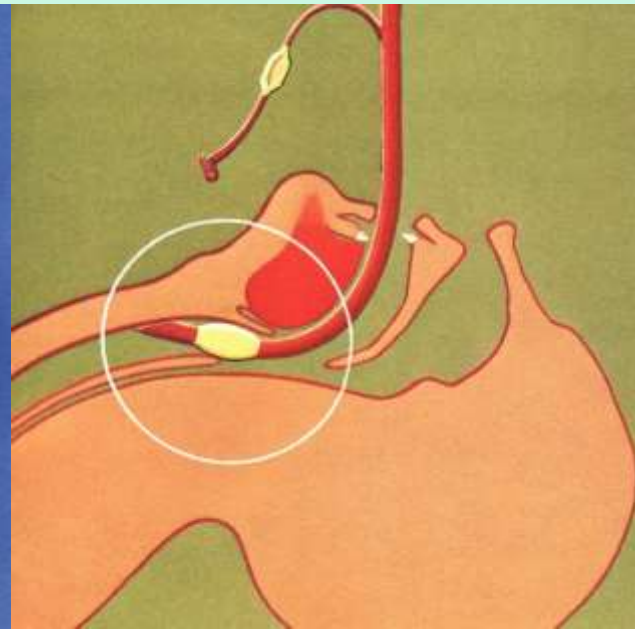


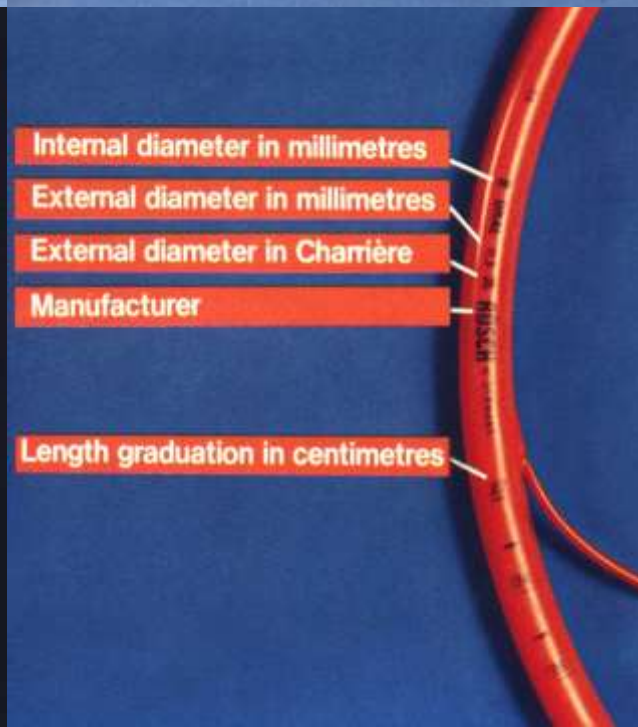
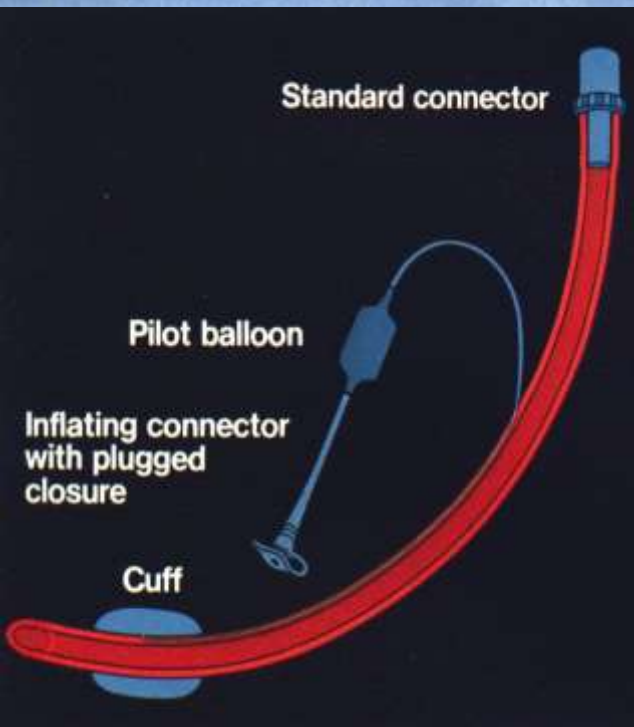
PROBLÉMY A KOMPLIKÁCIE 2/3





PROBLÉMY A KOMPLIKÁCIE 3/3





Pákový Laryngoskop (McCoy)

Heine Flexible Tip



Storz C-Mac

- The C-MAC (Karl Storz Endoscopy, Tuttlingen, Germany) spája modifikovanú **Macintosh lyžicu s videojednotkou**
- Špička lyžice je **viditeľná in situ!**
- Hrúbka lyžice 14 mm
- 2 mm kamera
- Šošovka vidí na 80°



GlideScope



- CMOS active pixel sensor (CMOS APS), videokamera a LCD s vysokým rozlíšením.
- Postupné **50-60° ohyby lyžice** pri vizualizácii hlasiviek znižuju potrebu výrazného predsunutia jazyka.
- Kamera je lokalizovaná na poslednom ohybe lyžice – lepší prehľad pracovného poľa (50°)
- Zanorená kamera - nižšie znečistenie
- Ohrievaná šošovky proti zahmlievaniu
- Potrebne **použitie vodiča ETT** (napr. Verathon 60°)
- **93-99% úspešnosť** intubácie v rôznych štúdiách
- Možnosťou záznamu, **výučba**
- Aj pri zlej polohovateľnosti hlavy dosiahne Cormack and Lehane grade I-II
- Vhodný najmä u **morbídnej obezity** (Cobalt)
- Vhodný pre **pre-hospital** podmienky (Glidescope Ranger)
- 2009 prvá tracheálna intubácia v teréne navádzané **telemedicínskou** technológiou z nemocnice

http://www.verathon.eu/verathon_GlideScope.html

Cooper RM et al: Early clinical experience with a new videolaryngoscope (GlideScope) in 728 patients.

Can J Anaesth. 2005, 52, 2, 191-8.

Rovsing L et al: GlideScope® Video Laryngoscope for Tracheal Intubation in Morbidly Obese Patients. 29

2008 WFSA Cape Town Abstract

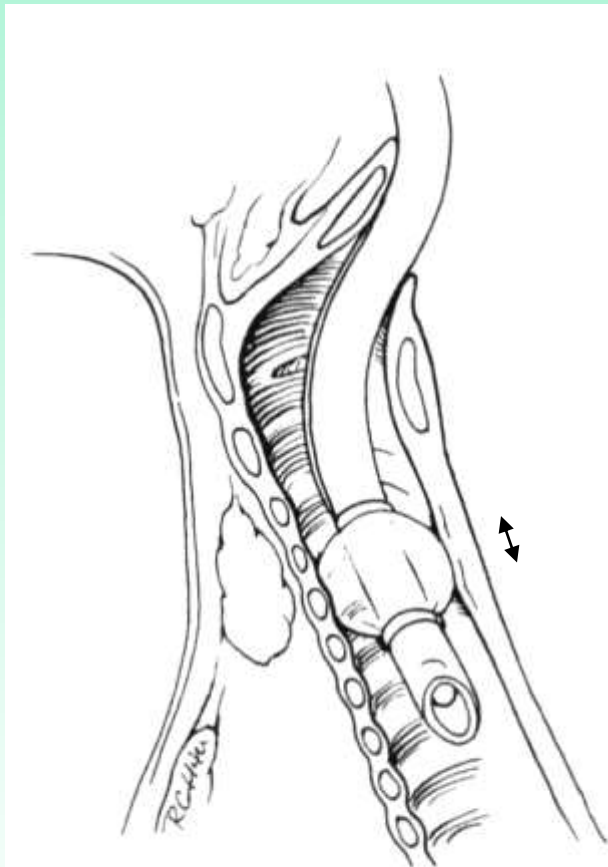
AirTraq

- **Jednorázový VL**, určený pre sťaženú intubáciu a pre neštandardné polohy pacienta a krku.
- Dva samostatné kanály:
 - **optický**: optický systém na batériu, okulár (video).
 - **vodiaci**: zadržiava ETT a vedie ju medzi hlasivky.
- Systém proti zahmlievaniu, nízkoteplotné svetlo.
- Bežné ETT.
- Ďalšie použitie AIRTRAQ:
 - Zavádzanie **fibroskopu** alebo **gastroskopu**
 - **Dvojlúmenové ETT**

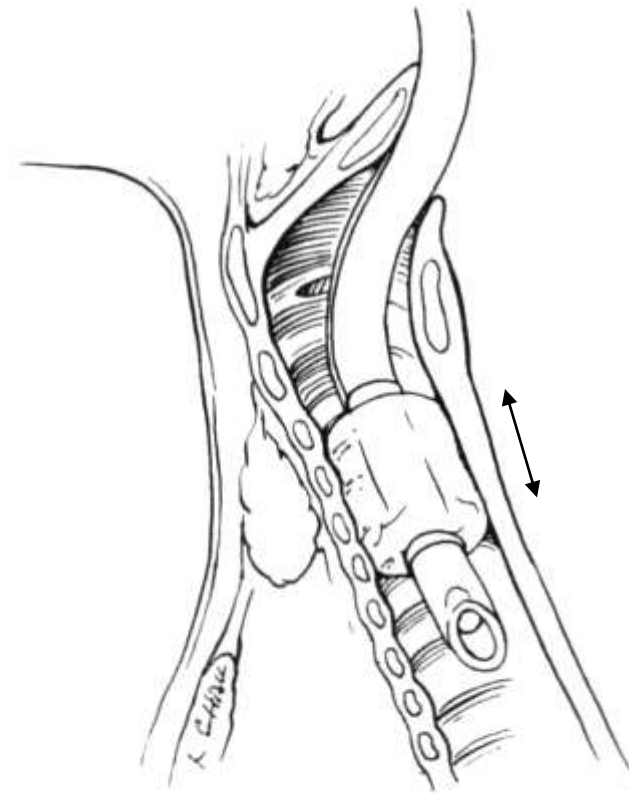


DRUH MANŽETY A RIZIKO POŠKODENIA SLIZNICE

Low volume-high pressure



High volume-low pressure



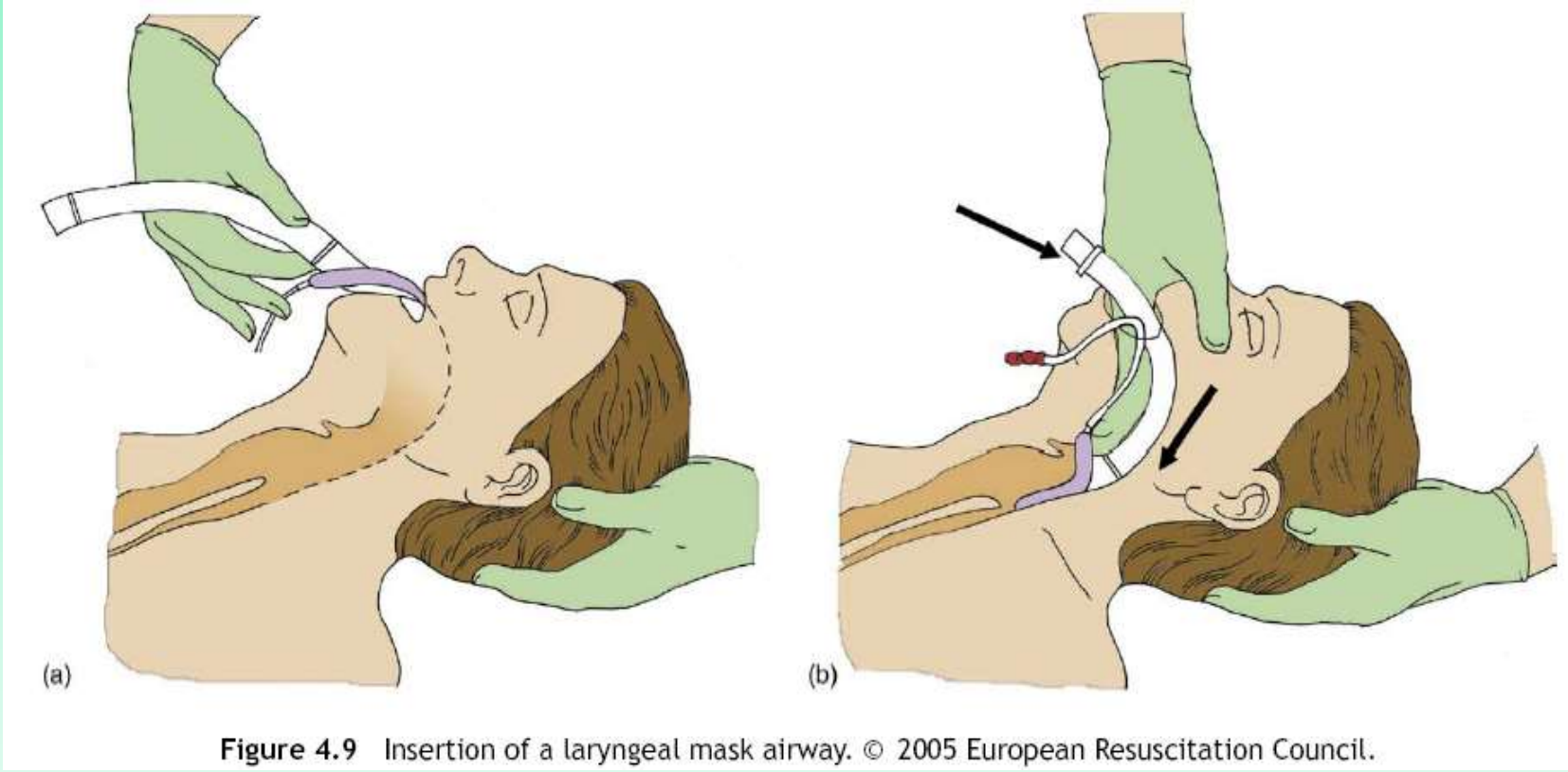


Figure 4.9 Insertion of a laryngeal mask airway. © 2005 European Resuscitation Council.

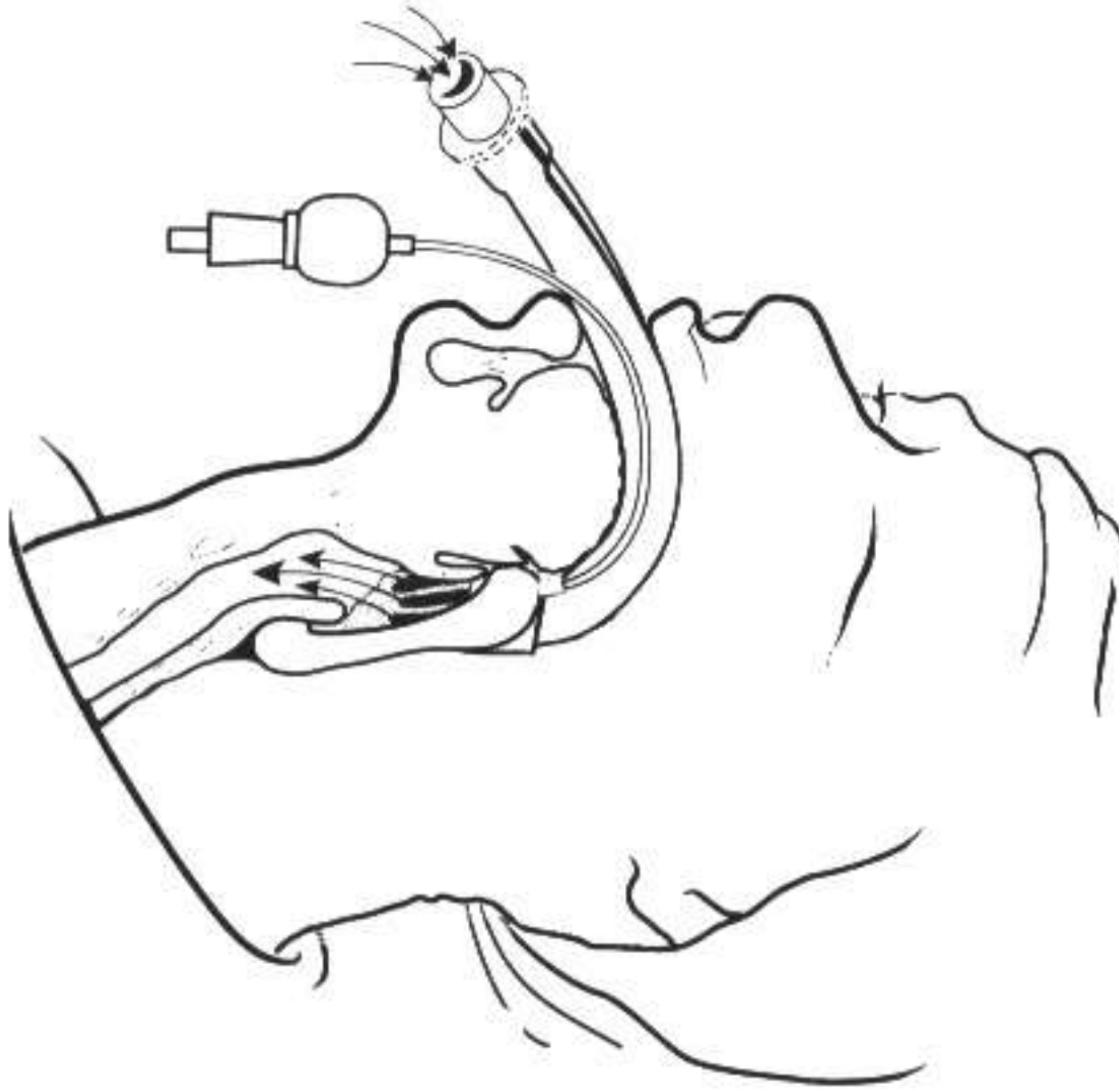


Fig. 16.39 Diagram of a laryngeal mask in situ.

LARYNGEÁLNA MASKA

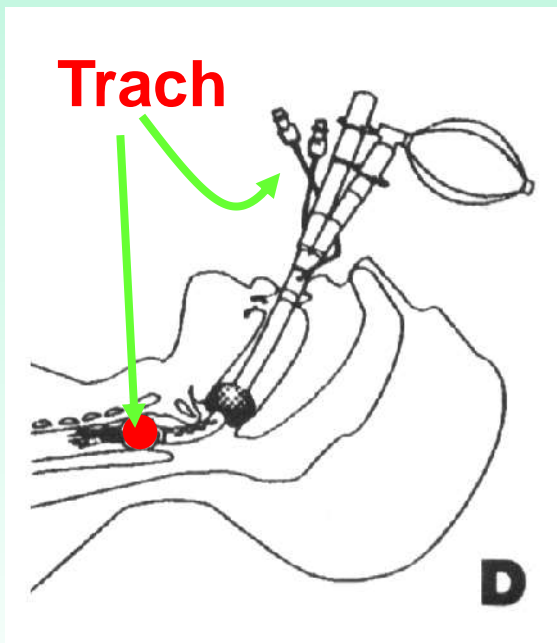
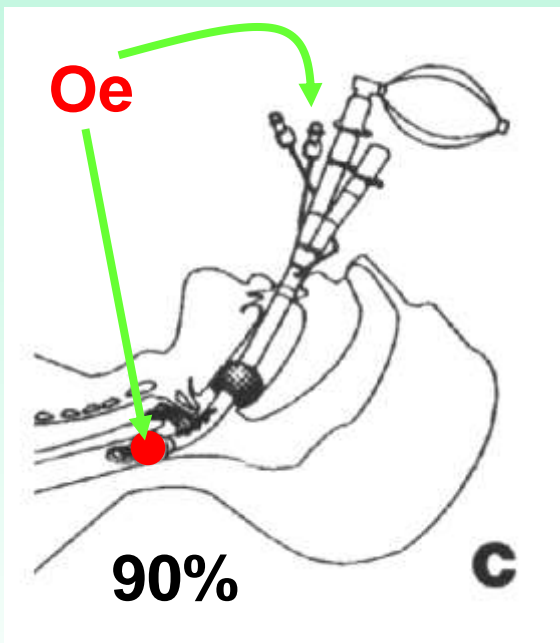
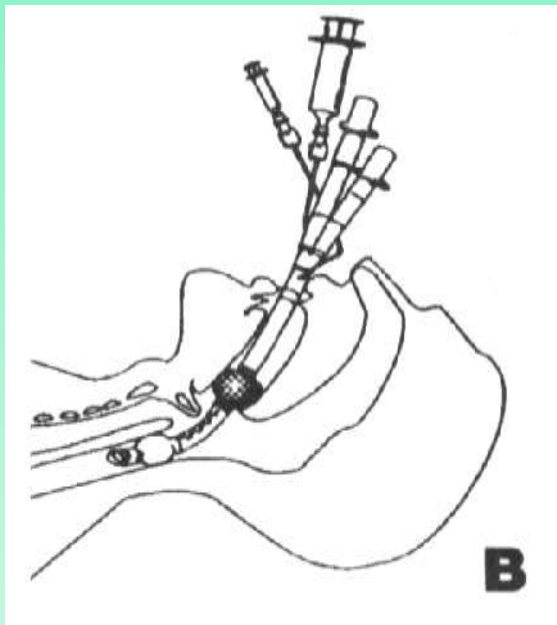
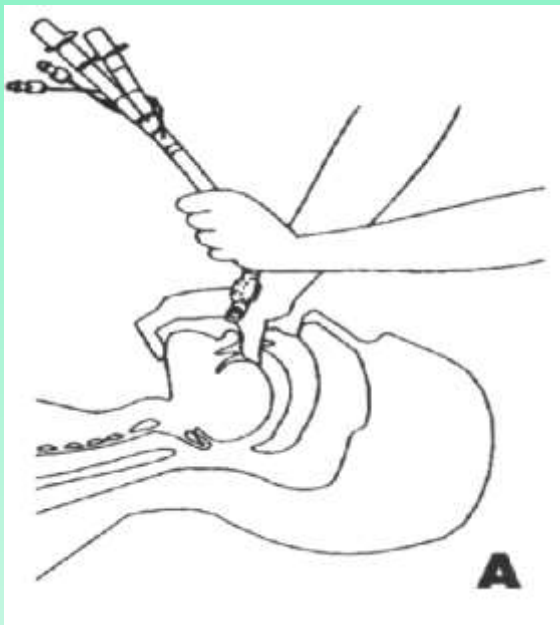
Laryngeálny Tubus (LTS-II®)

Laryngeálny tubus LTS-II s dvojitým lúmenom **dýchanie** + s možnosťou odsávania alebo zavedenia **žalúdovej sondy**.

Je **alternatívou** na vykonávanie umelého dýchania maskou, laryngeálnou maskou alebo v prípadoch, keď nie je nutná tracheálna intubácia.

- bezlatexový
- na opakované použitie
- autoklávovateľný do 134°C
- zavádzanie je atraumatické pre zuby a hlasivky
- orientačné značky pre zuby
- veľkoobjemové balóniky sa dobre anatomicky prispôbia
- účinné dýchanie
- dobrá tesnosť pri vyšších dýchacích tlakoch
- možnosť odsávania z dýchacích ciest a fibrobronchoskopie
- možnosť odsávania z pažeráka a zavedenie žalúdovej sondy

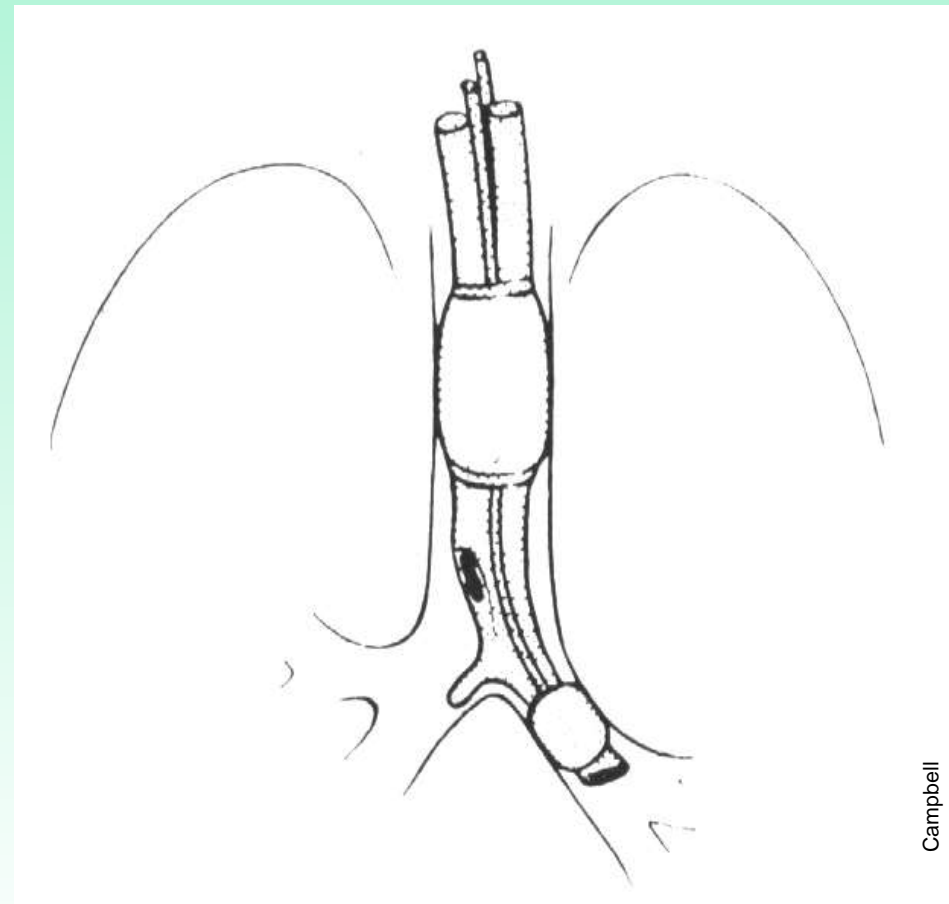
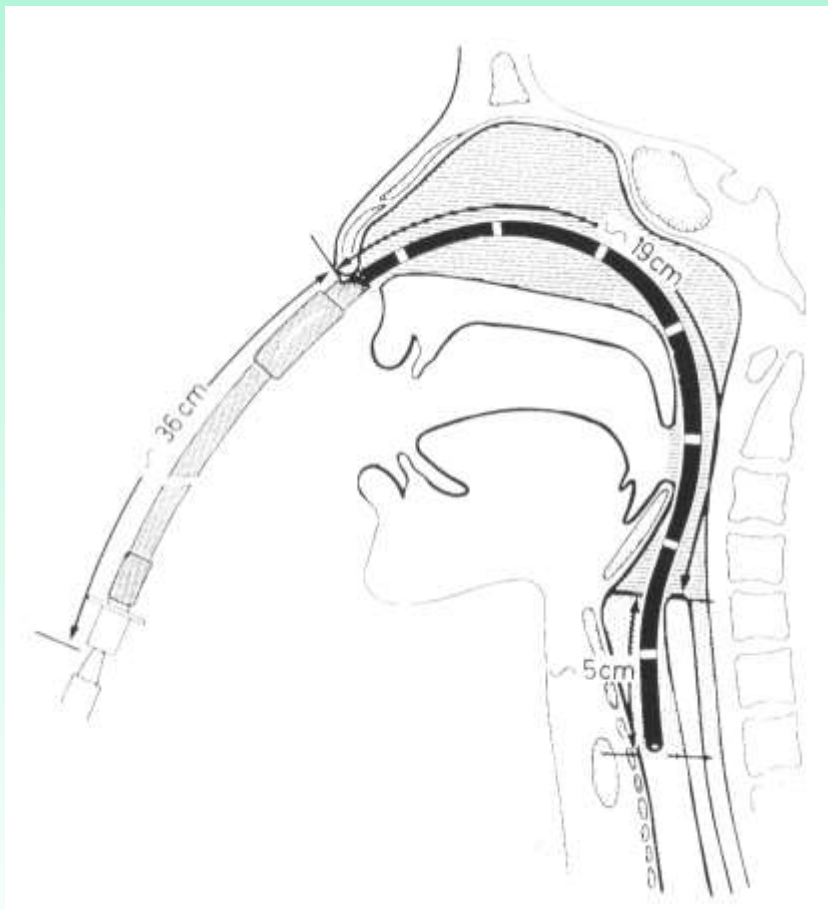


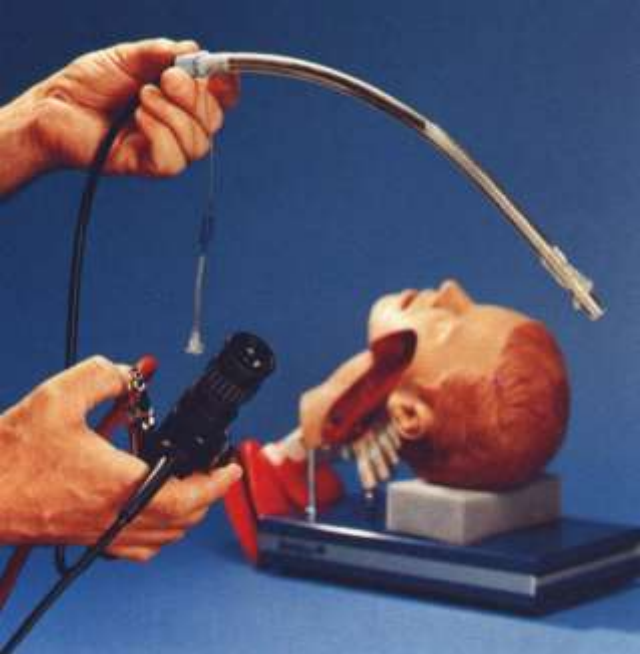


CombiTube

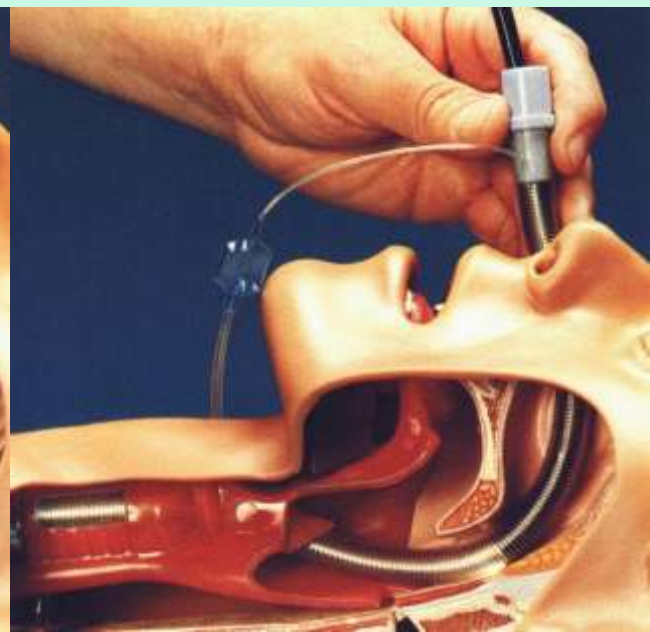
FIBROSKOPICKÁ INTUBÁCIA NOSOM

POLOHA ĽAVEJ DVOJLÚMENOVEJ KANYLY

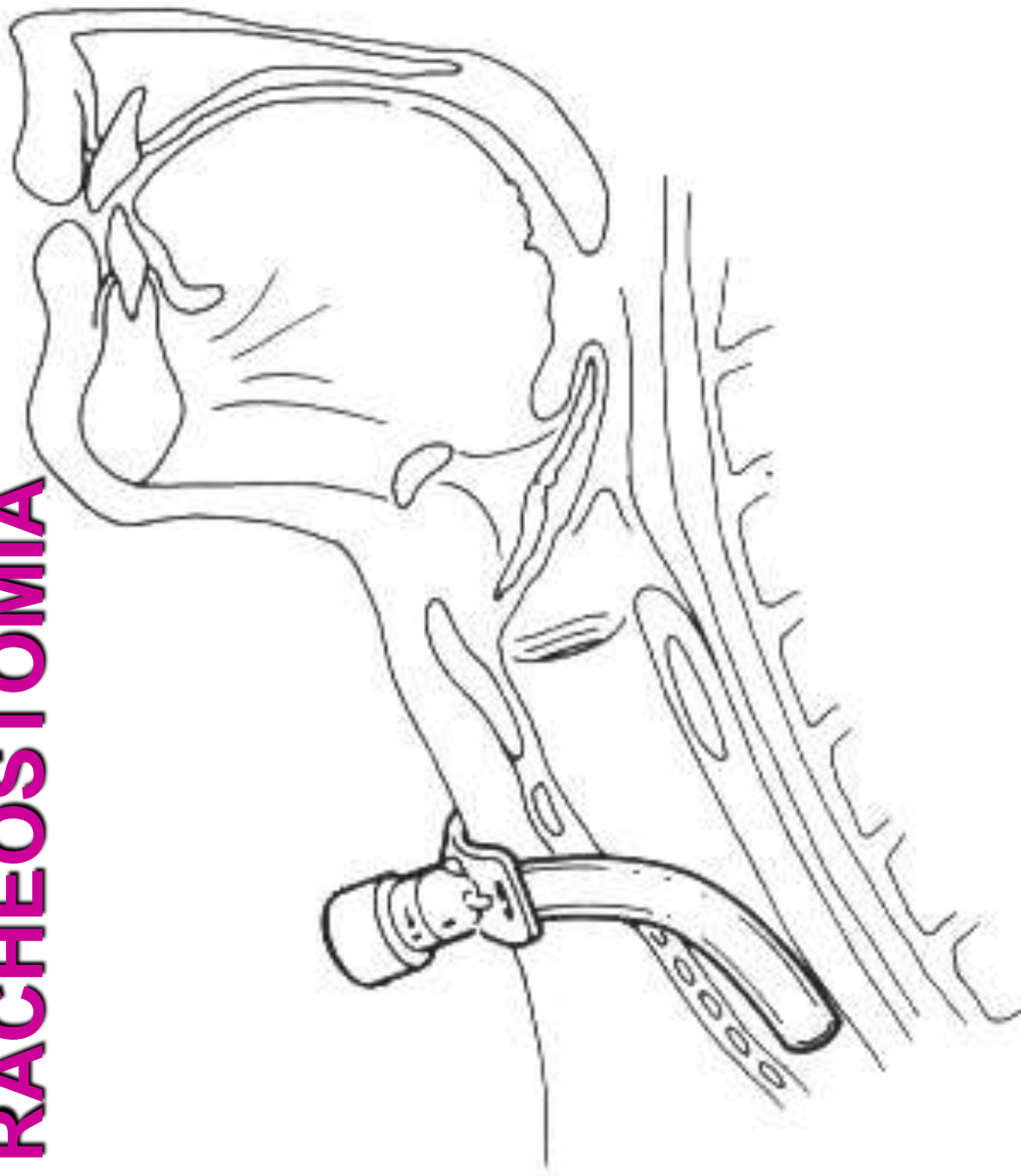




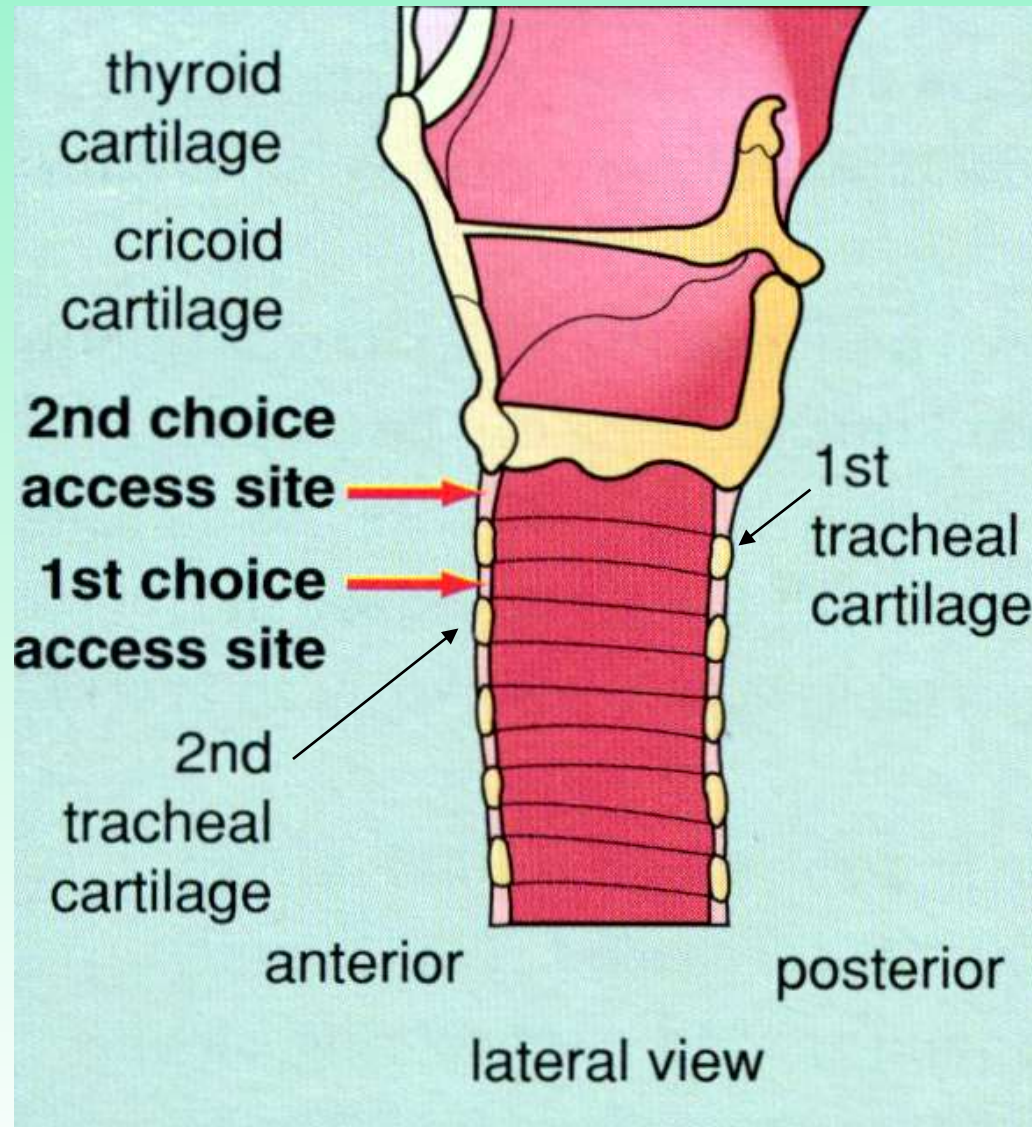
FIBROSKOPICKÁ NTI



TRACHEOSTOMIA



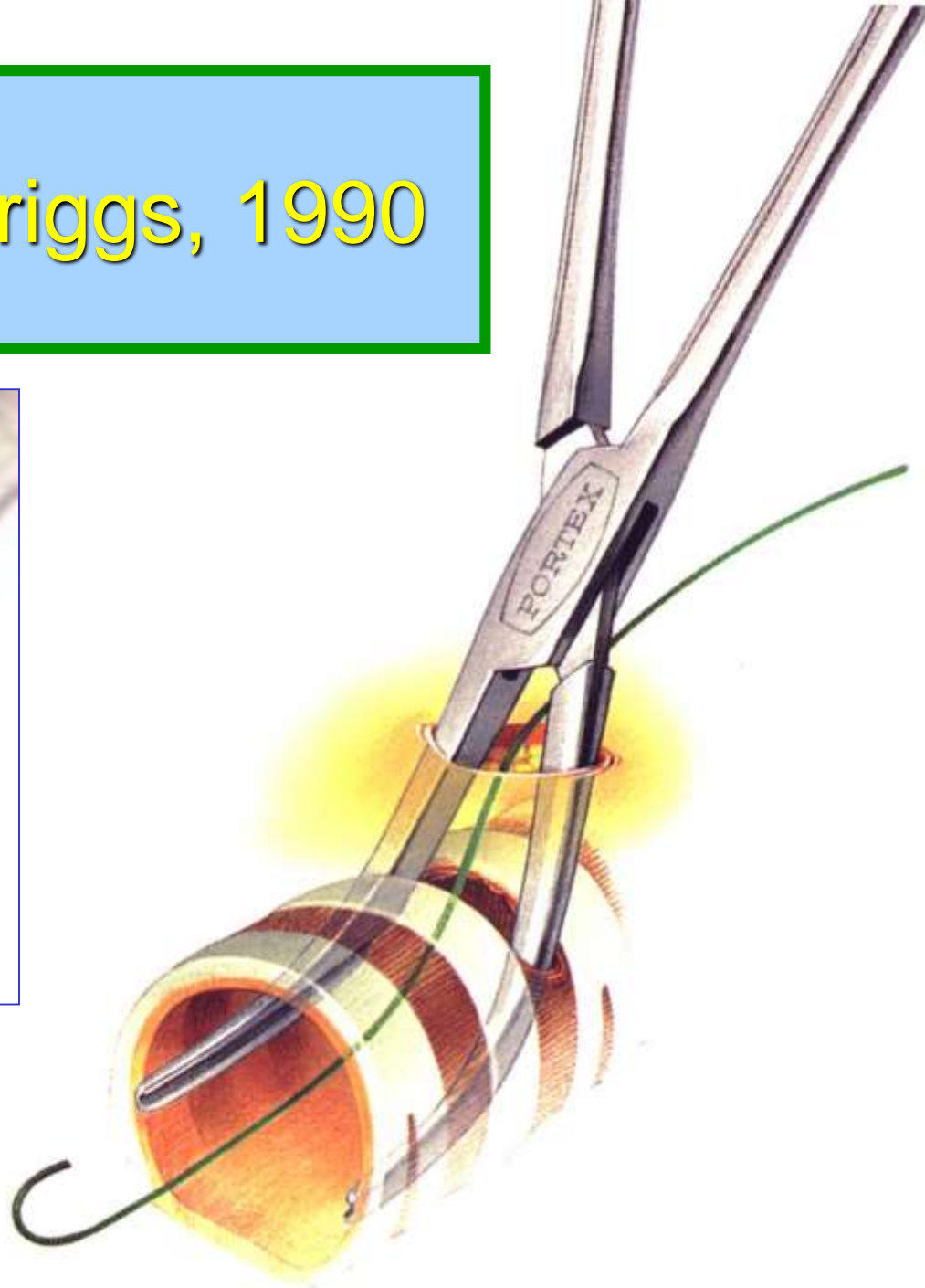
MIESTA TRACHEOSTÓMIE



PDT Griggs, 1990



peán so žliabkom
pre vodiaci drôt





QuickTrach



RUSCH

Emergency Cricothyroidotomy

Based on the simple description of 'stab, twist, bougie, tube', the ScalpelCric is meant to facilitate the execution of the scalpel technique.

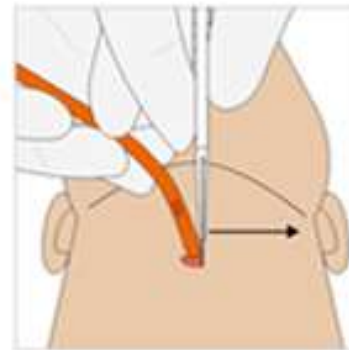
Scalpel-Bougie-Tube



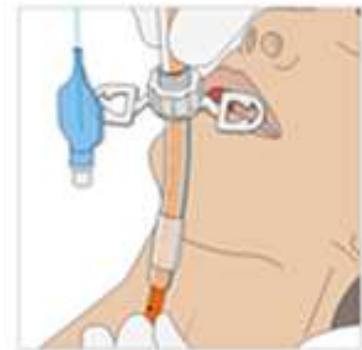
1. stab



2. twist

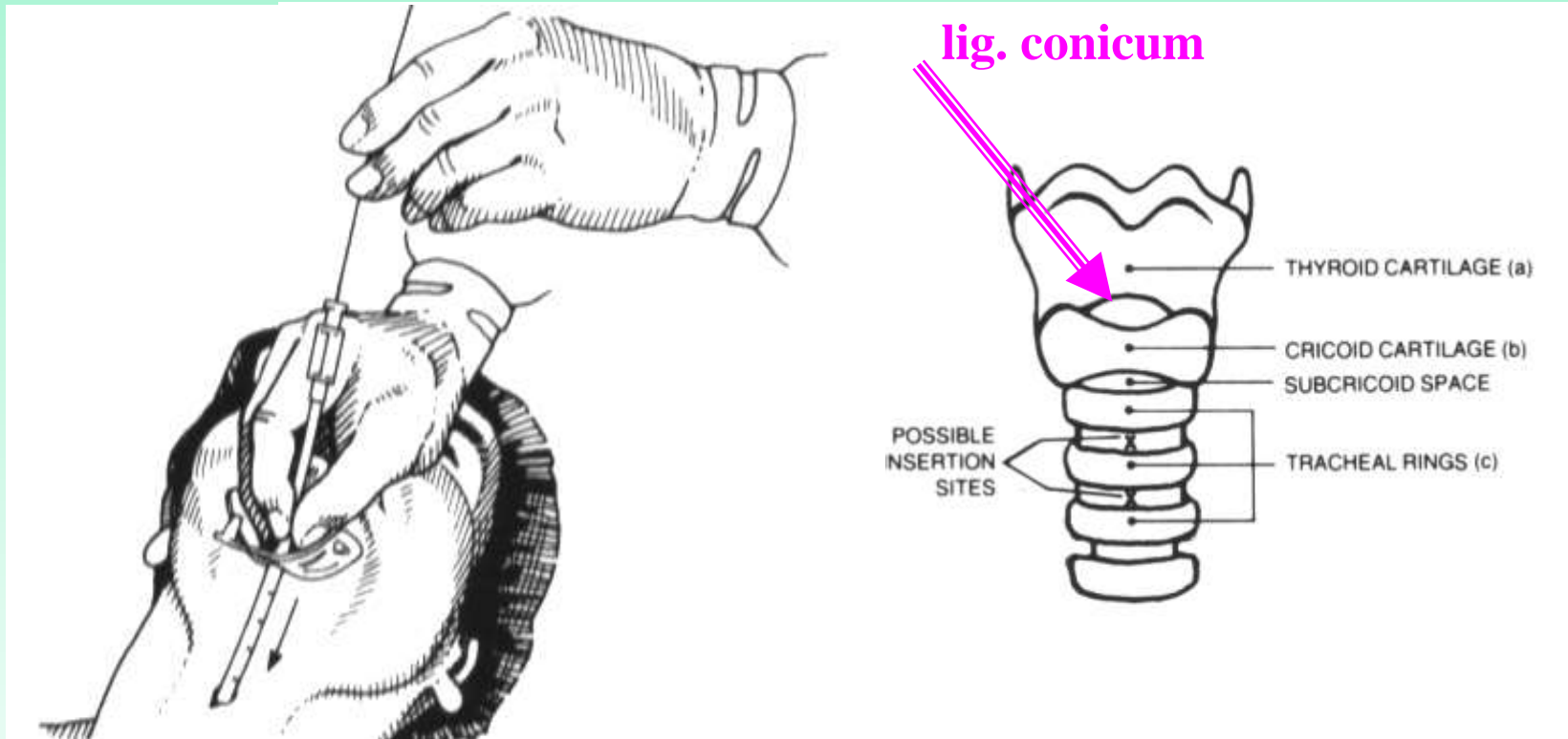


3. bougie



4. tube

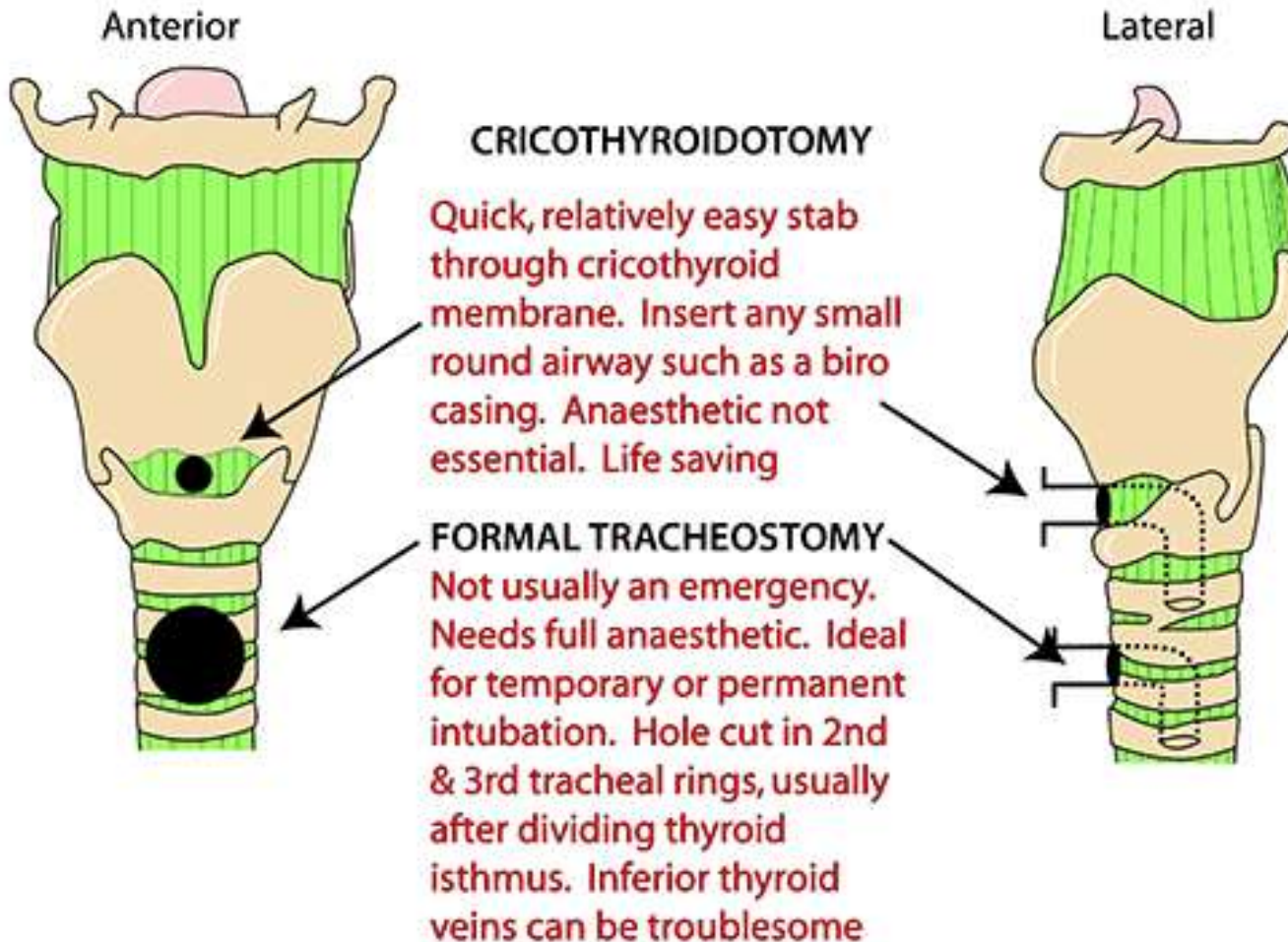
MINITRACH Seldinger



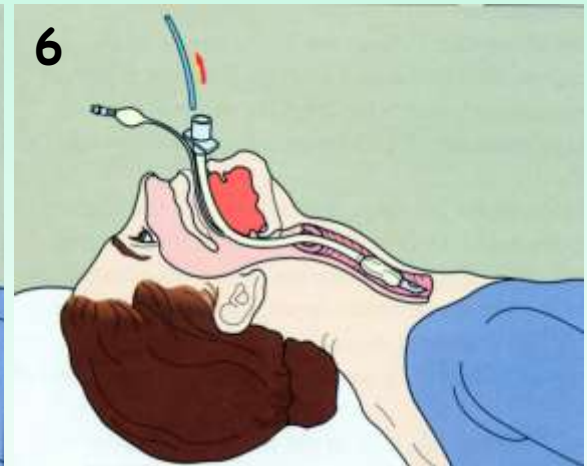
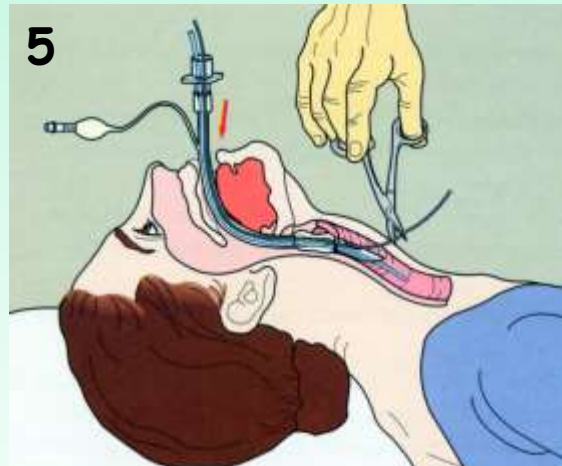
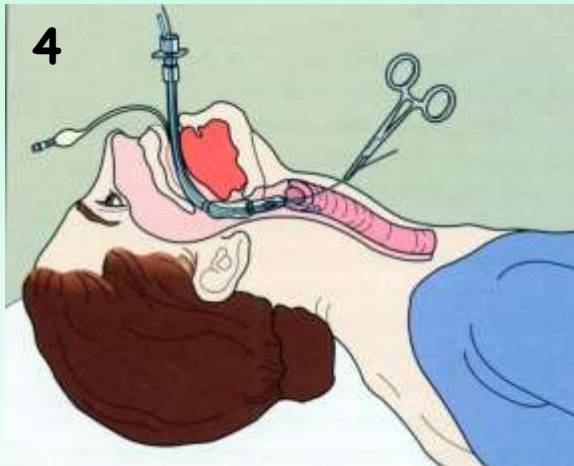
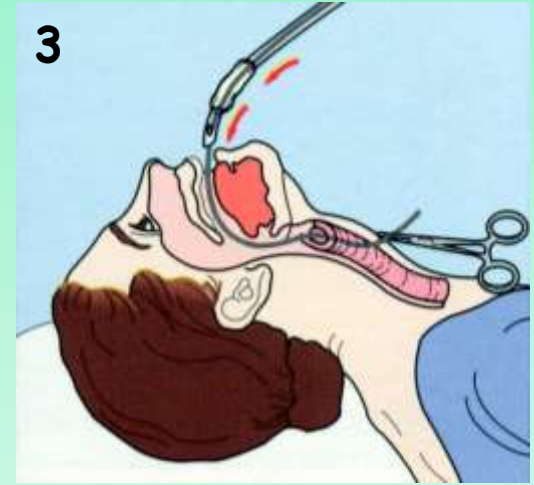
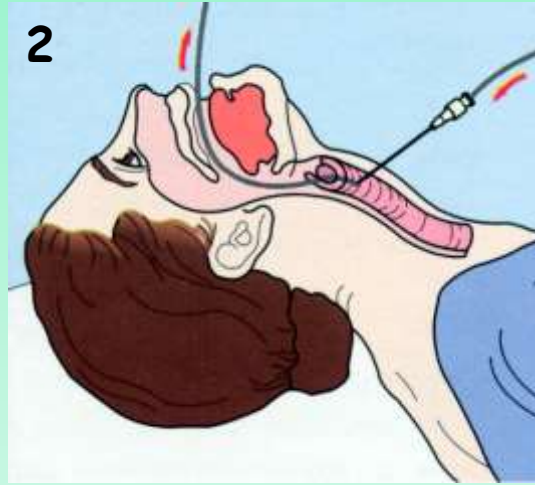
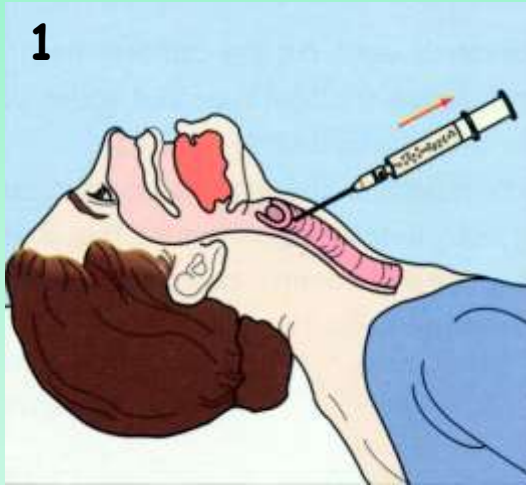
Cricothyroidotomy: 5. x = 96% <40 s,

David T. Wong et al.: What Is the Minimum Training Required for Successful Cricothyroidotomy? A Study in Mannequins. *Anesthesiology* 2003; 98:349–53.

EMERGENCY ACCESS TO TRACHEA



RETROGRÁDNA INTUBÁCIA



Následky ETI

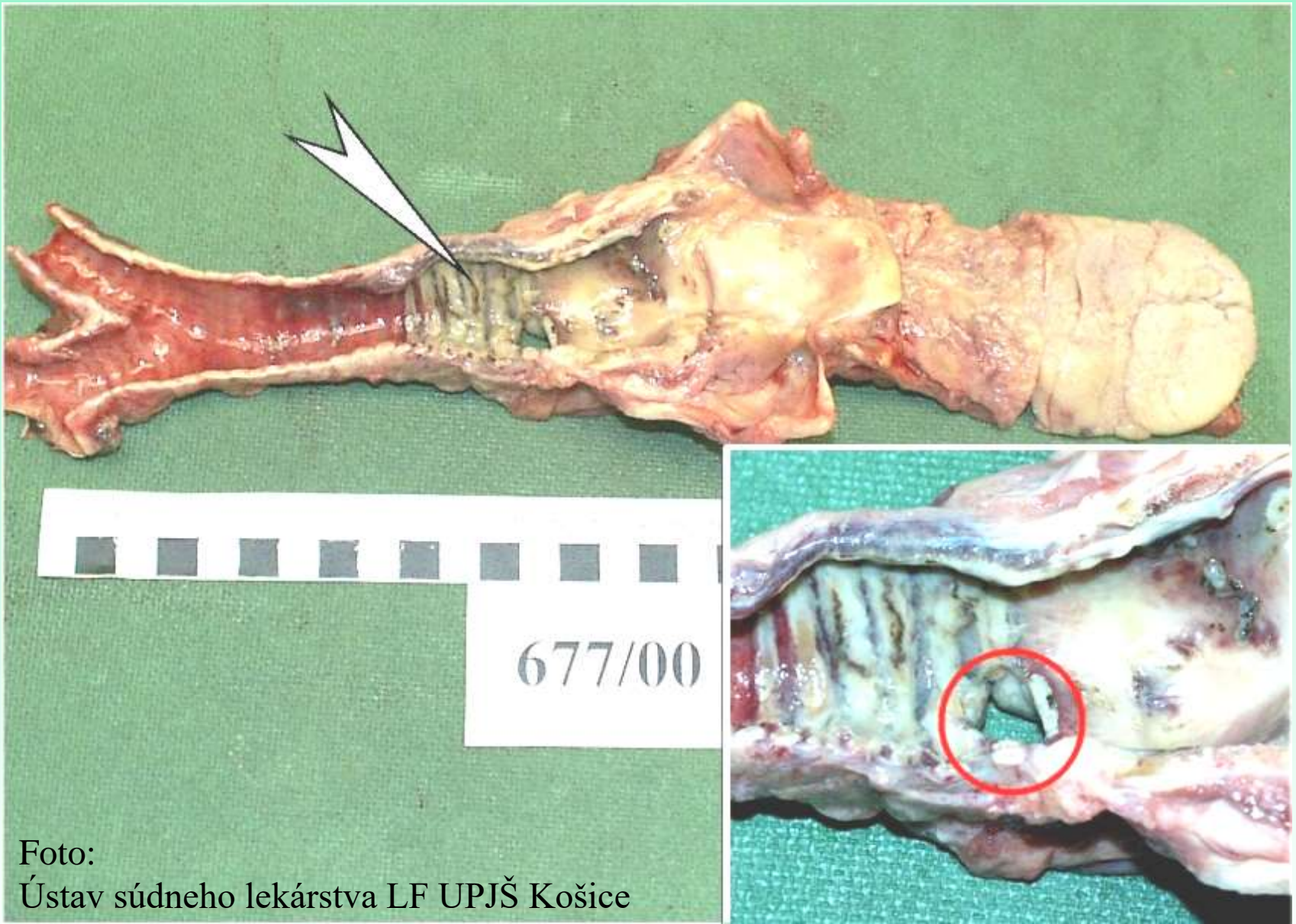
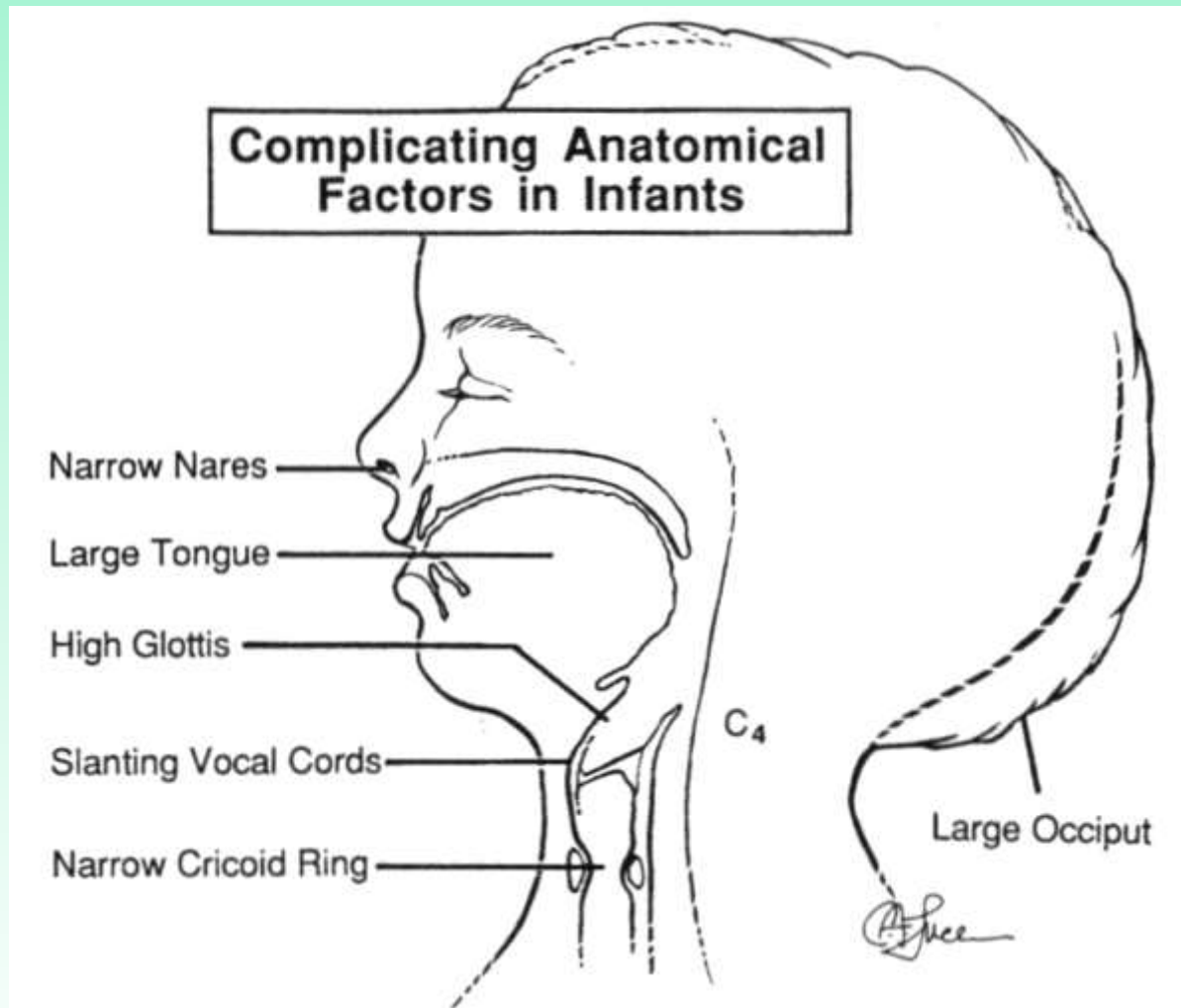


Foto:
Ústav súdneho lekárstva LF UPJŠ Košice

ANATOMICÉ ODLIŠNOSTI DÝCHACÍCH CIEST DETÍ



ROZDIEL V TVARE HRTANA U DOSPELÝCH (A) A DETÍ (B)

