Airway management

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Maintaining airway

- Noninvasive
    - •airway
    - •laryngeal mask
    - •combitube
- invasive
    - •OTI, NTI
    - •coniotomy
    - •tracheotomy

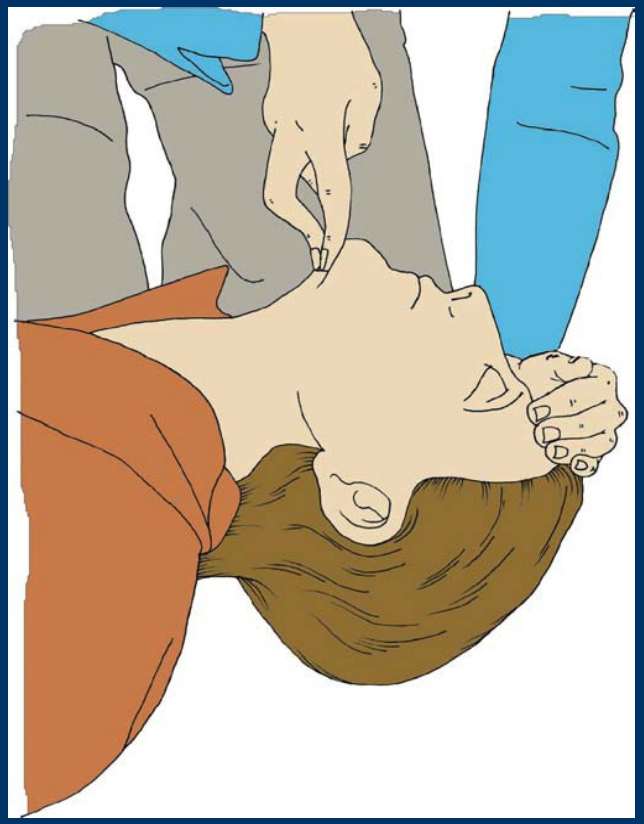
vocal cords

Routine Airway Management

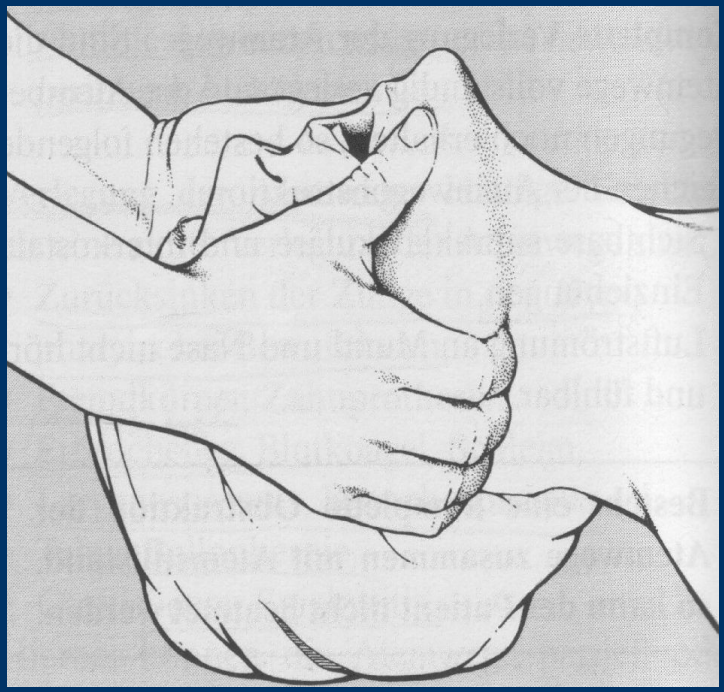
- Mask
- LM
- OTI

Keep airway open

haed tilt, chin lift



Esmarch man.



Guedel airway
Oro-Pharyngeal Airway

I: unconsciousness
+ airway obstruction with tongue

Correct size OPA:
- distance angle of mouth --- ear

Risk in mild unconsciousness:
- vomitus + aspiration

Naso-Pharyngeal Airway (trumpet)

Correct size of NPA:

- distance nostril --- ear

Risk:

- bleeding from nasal cavity

- Use of lubricant is essential

Face mask ventilation

Positive pressure ventilation by bag-valve mask

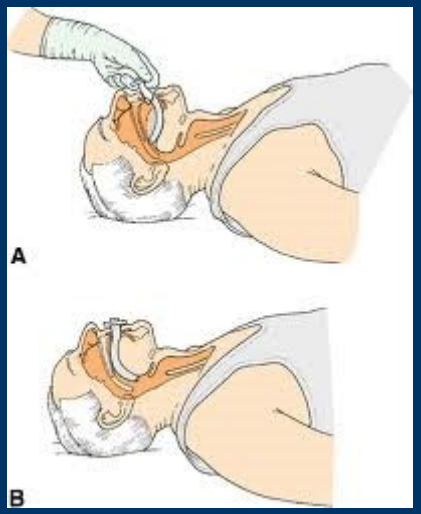
- correct volume = movement of chest
- f 10/min
- 100% O2

- 1 hand hold:
  - inch + index f.
  - 3 ff. - chin
- 2 hands

(Bag) Mask Ventilation

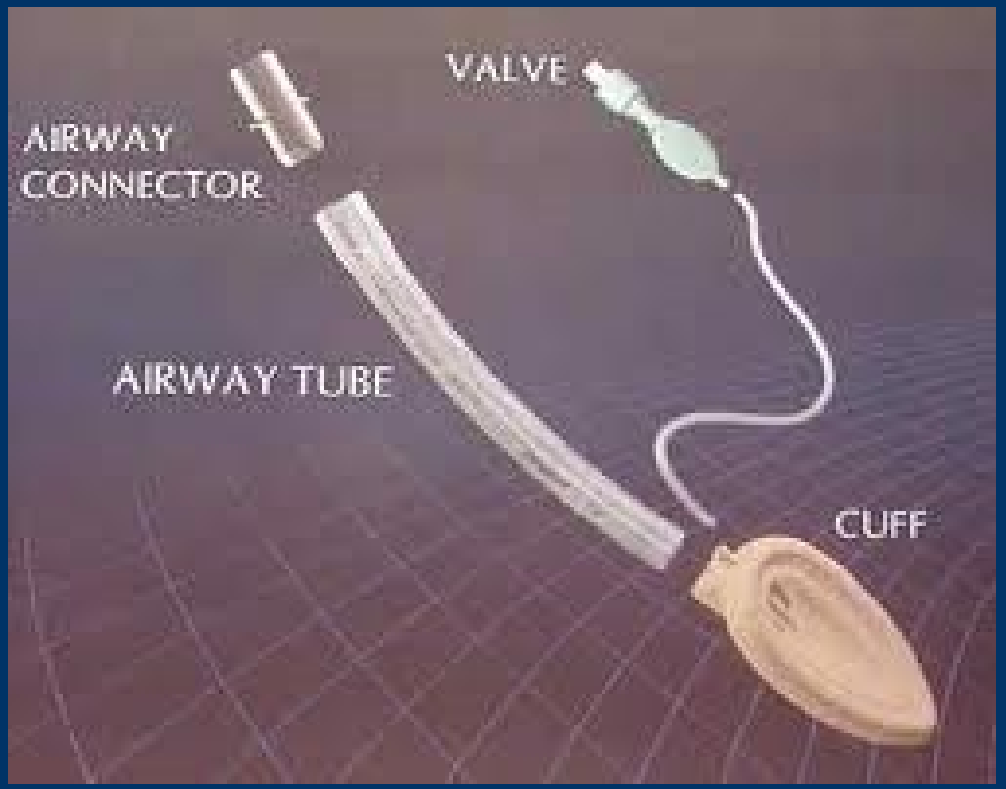
Improved by

- OPA



LM Classic, ProSeal

Components of LM



LM

placed against glottis (radix of tongue, recessus piriformis, esophageal superior sphincter)

I: instead face mask, OTI, difficult airway

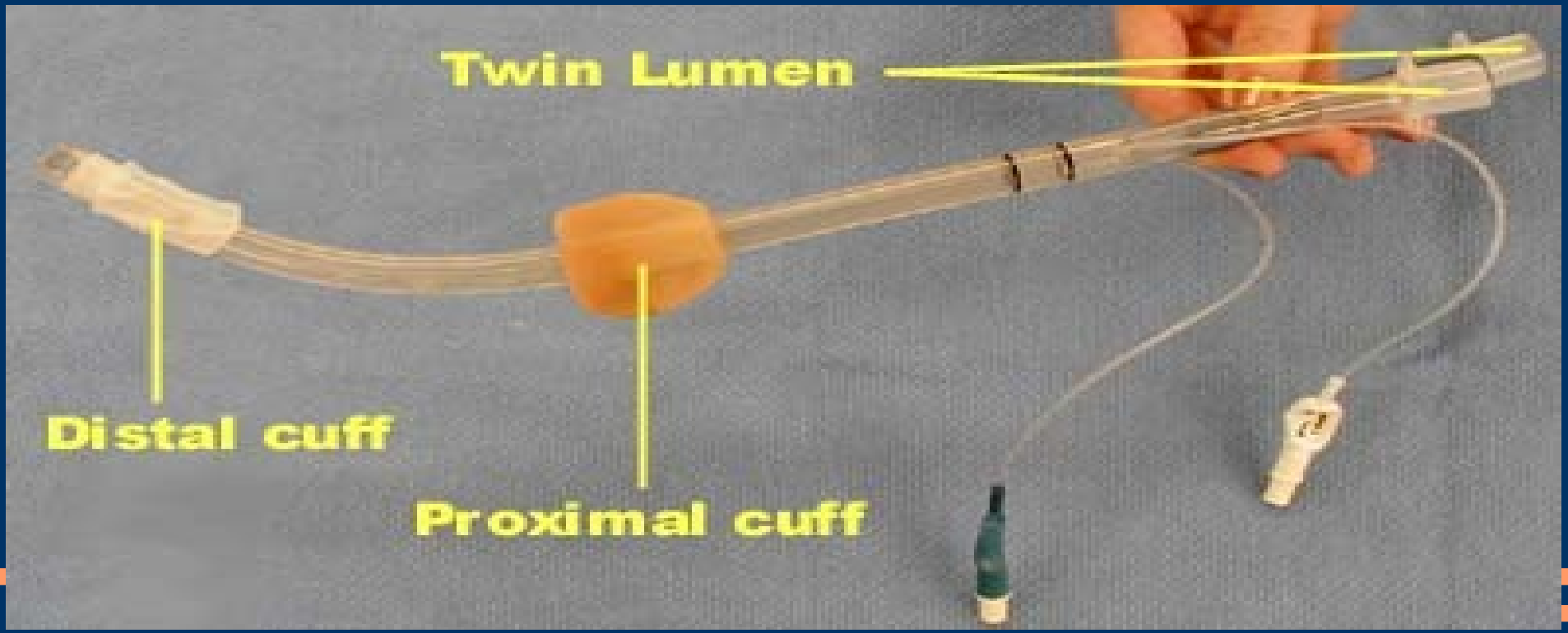
CI:

- full stomach
- gastro-esophageal reflux,
- high inspiratory pressure
- longer operation

The LMA Unique™ (top), the LMA Fastrach™ (middle) and the LMA ProSeal™ (bottom).

Combitube

- emergency situations instead OTI
- I: difficult airway
- CI: stenosing process in pharynx / trachea



Tracheal intubation

Def: Placing tube to trachea through mouth/nose and larynx.

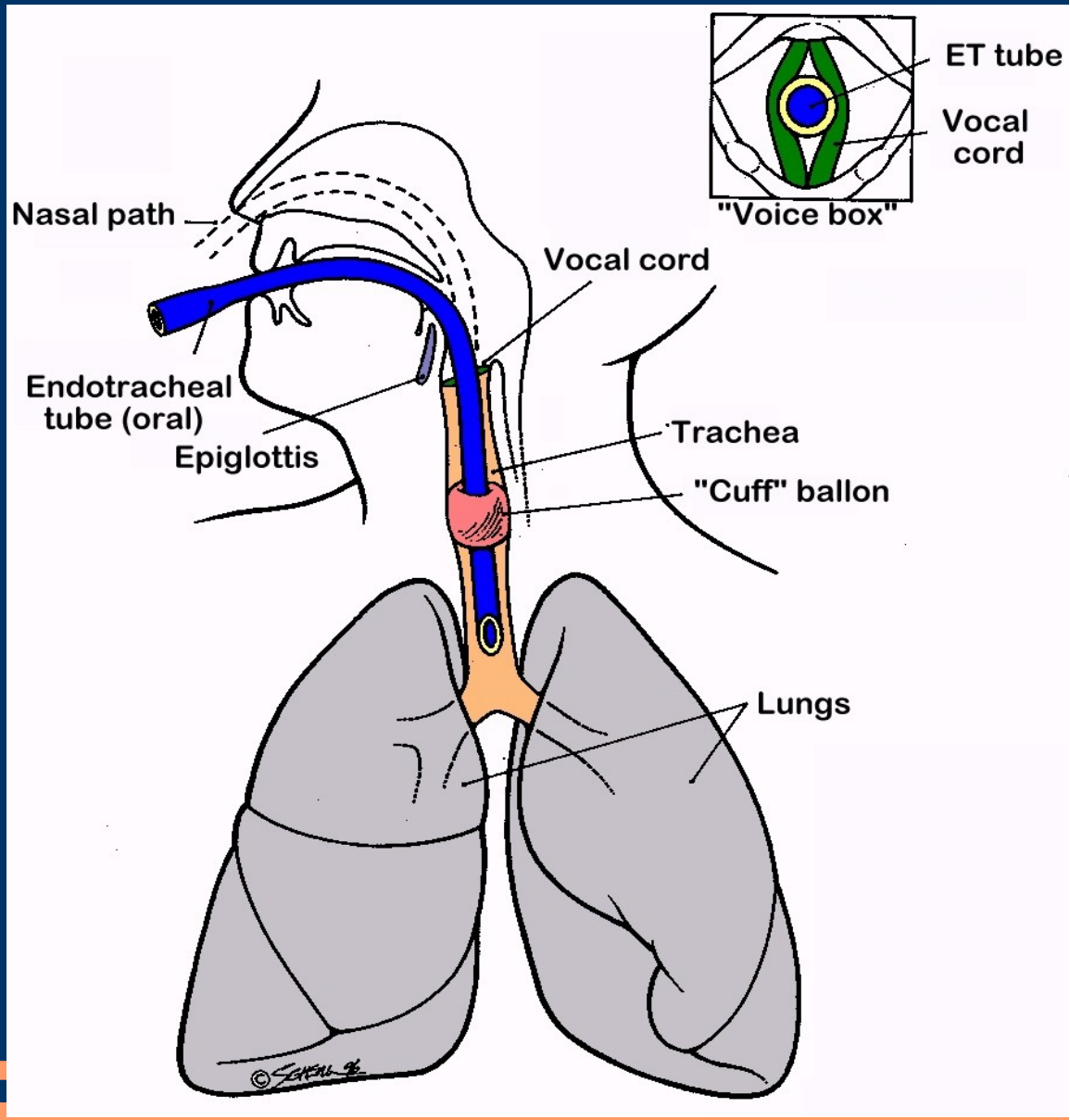
I:

- maintain open airway (GCS < 8)
- toilet (no cough)
- maintain ventilation (shock, hypoventilation)

narrowest place in airway – vocal cords
– subglotic space (<8years)

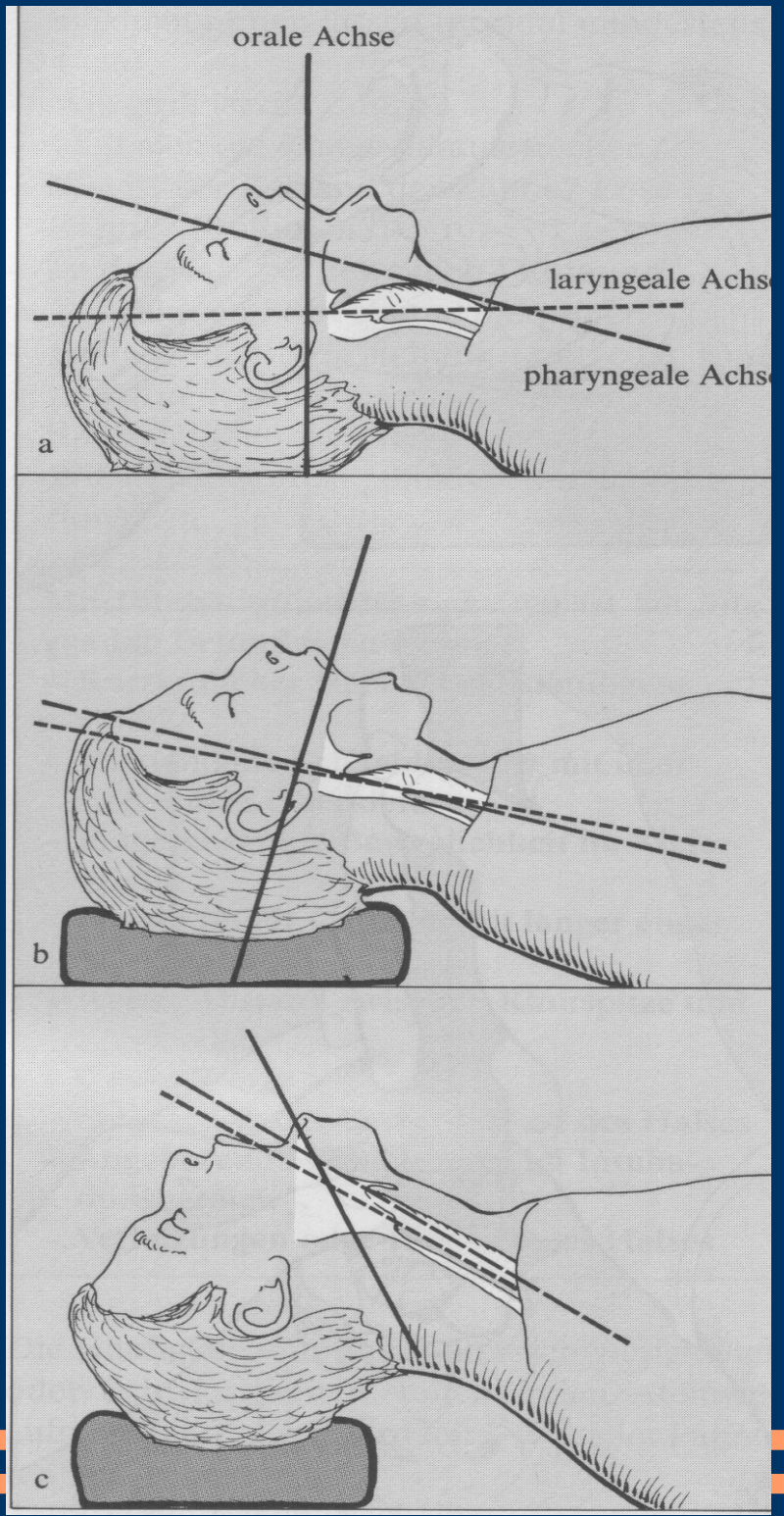
OTI, NTI - aids:

- laryngoscope
- Magill tongs
- tracheal tubes
- syringe
- lead

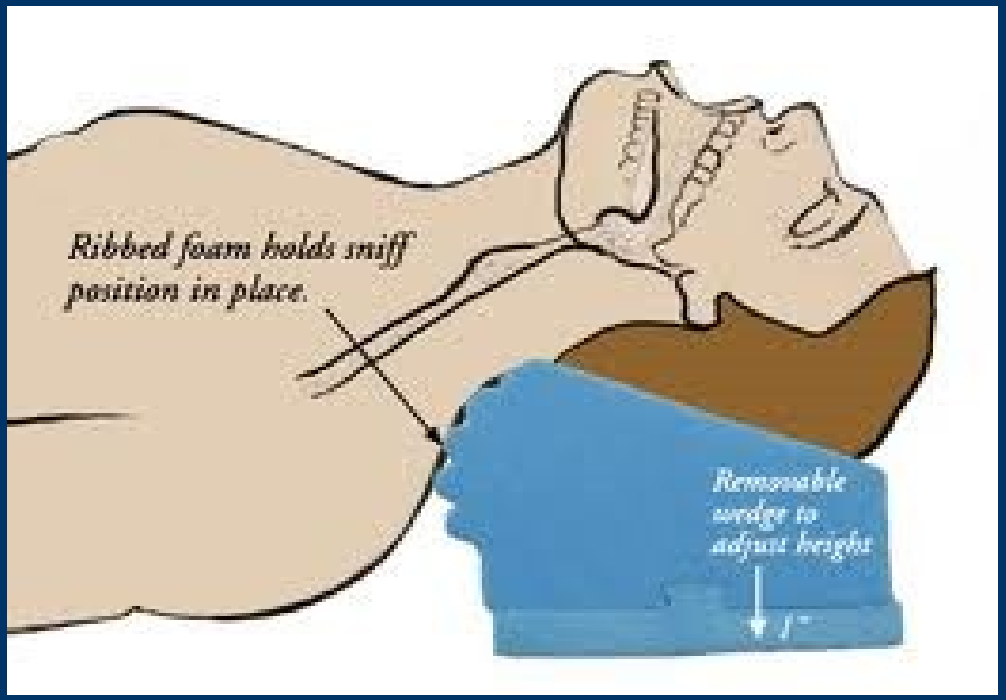


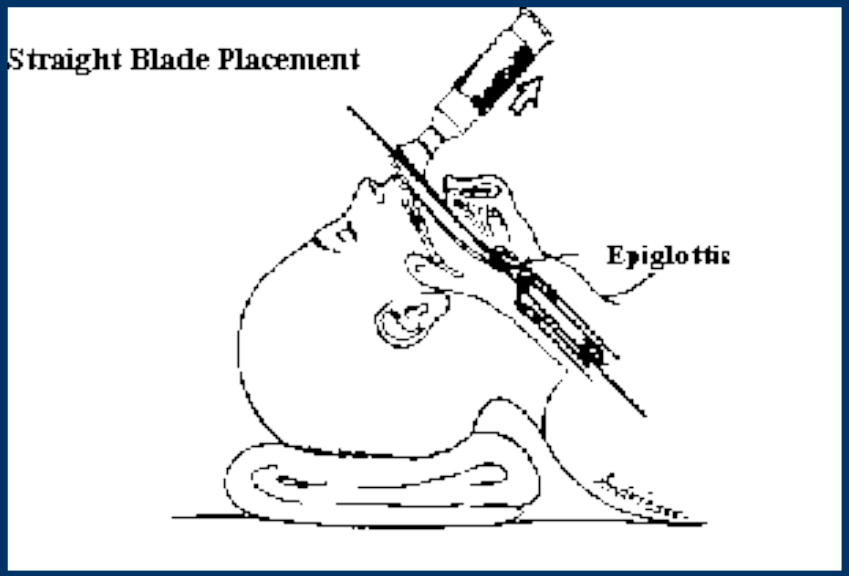
How to:

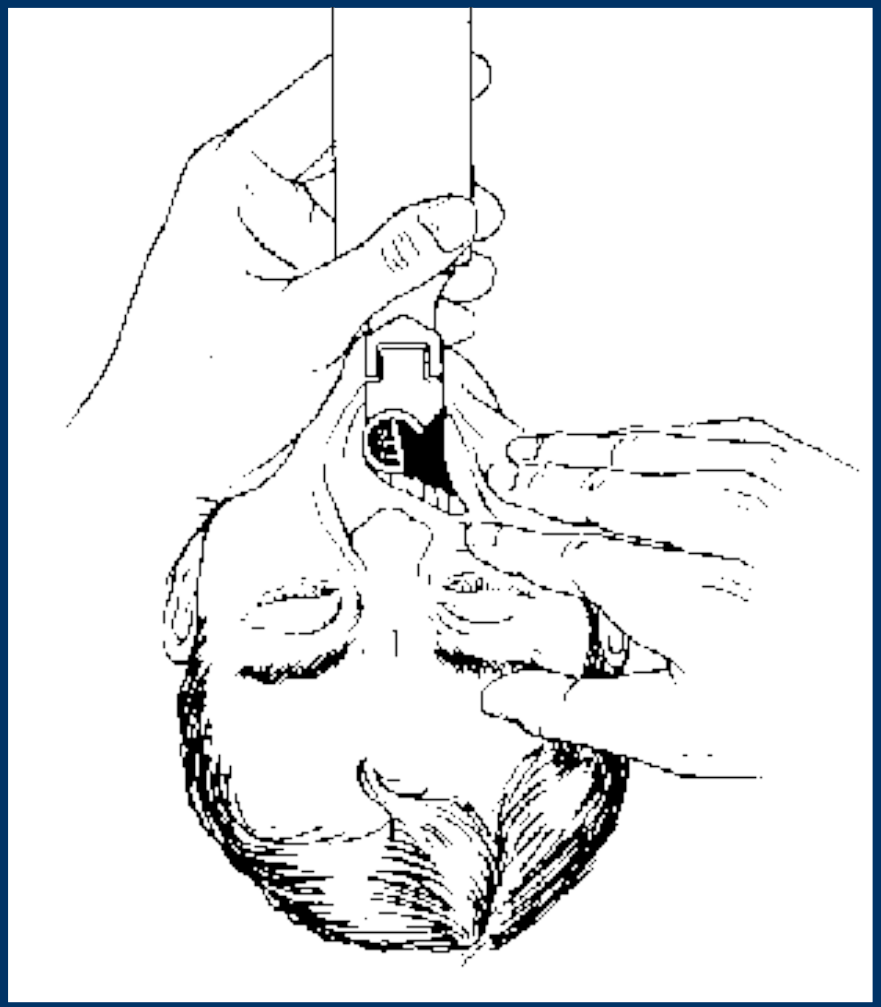
- prepare all aids, (ventilate)
- position of p.
- LA, GA, coma
- direct laryngoscopy
- placing tube
- inflate cuff
- ensure position

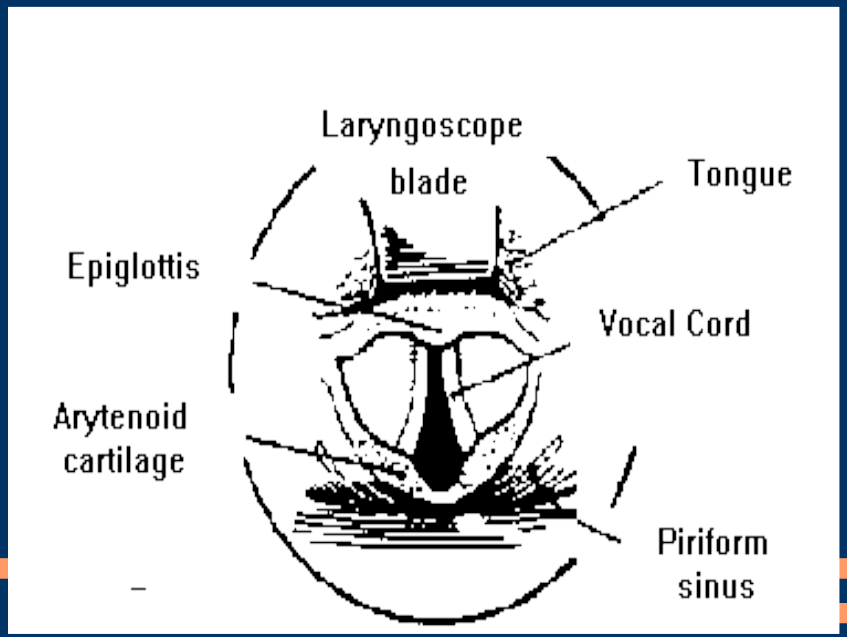


Head position



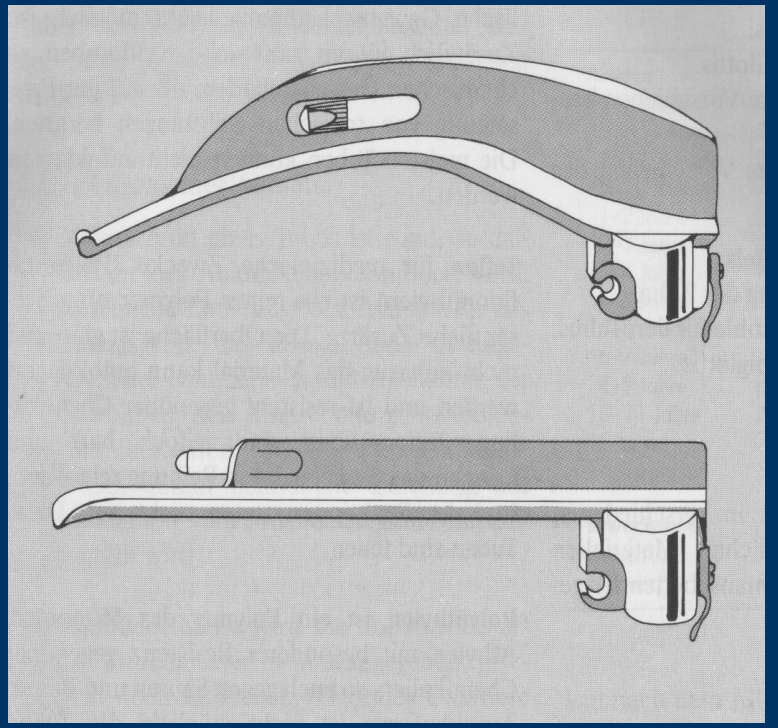

Straight Blade Placement
Epiglottis

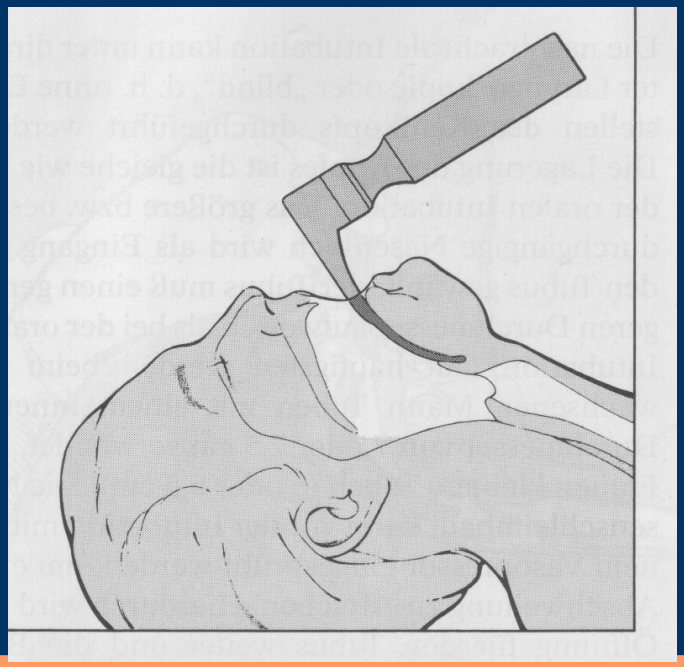


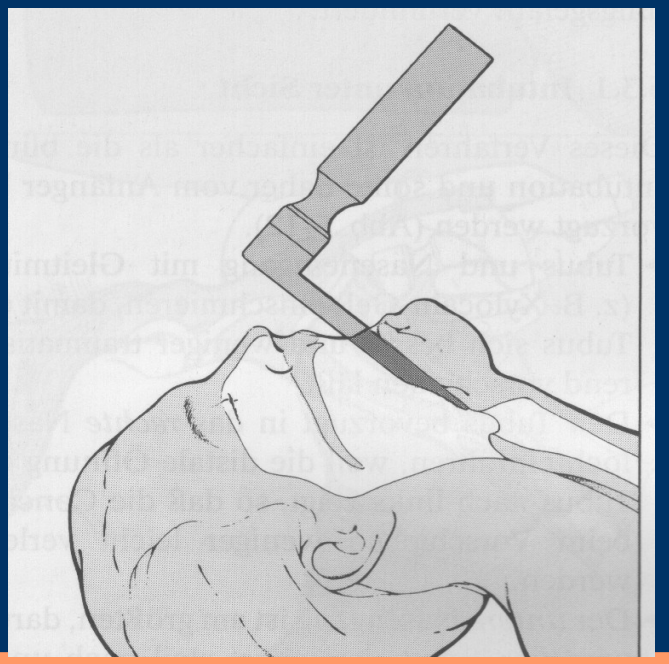

Laryngoscope
blade
Tongue
Epiglottis
Vocal Cord
Arytenoid
cartilage
Piriform
sinus

Laryngoscope:

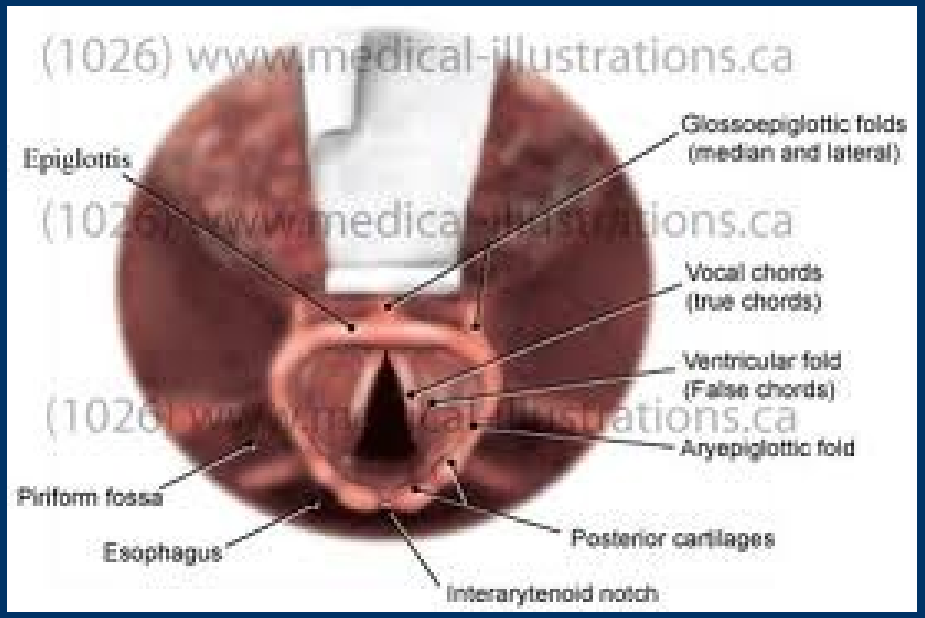
- crooked spoon - Macintosh
- straight spoon - Miller



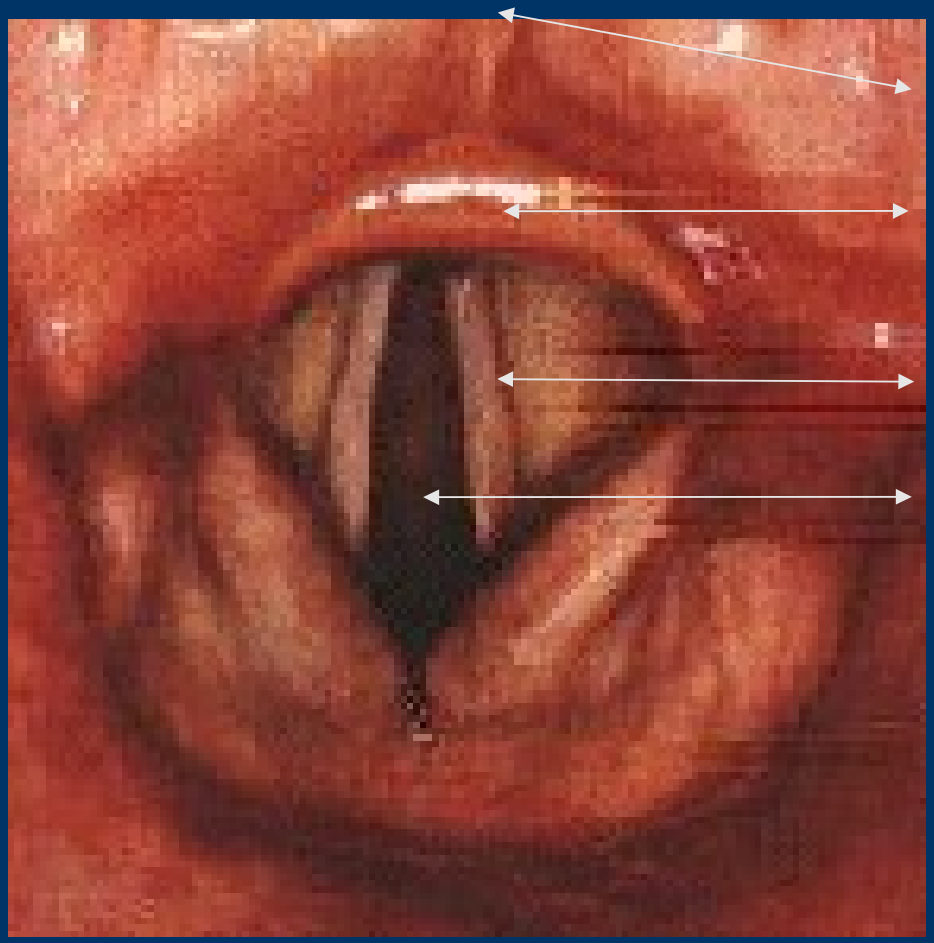




Laryngoscopic view



Laryngoscopic view:



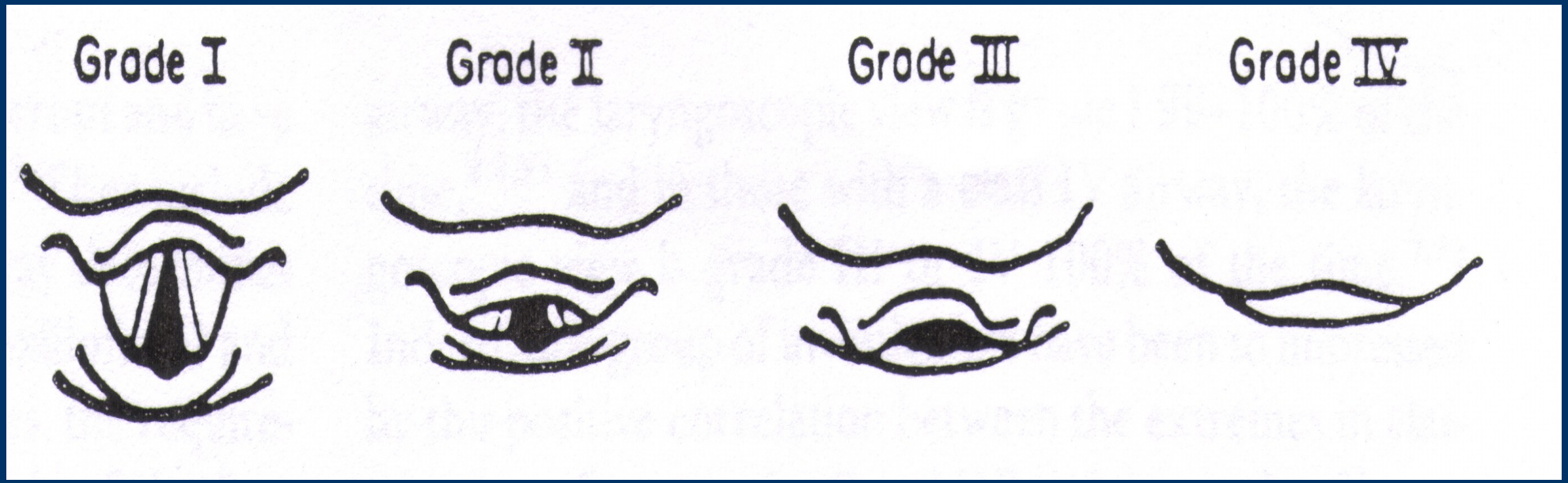
radix of tongue

epiglottis

vocal cords

trachea

Always easy? (Cormac & Lehane)



Improvement of View

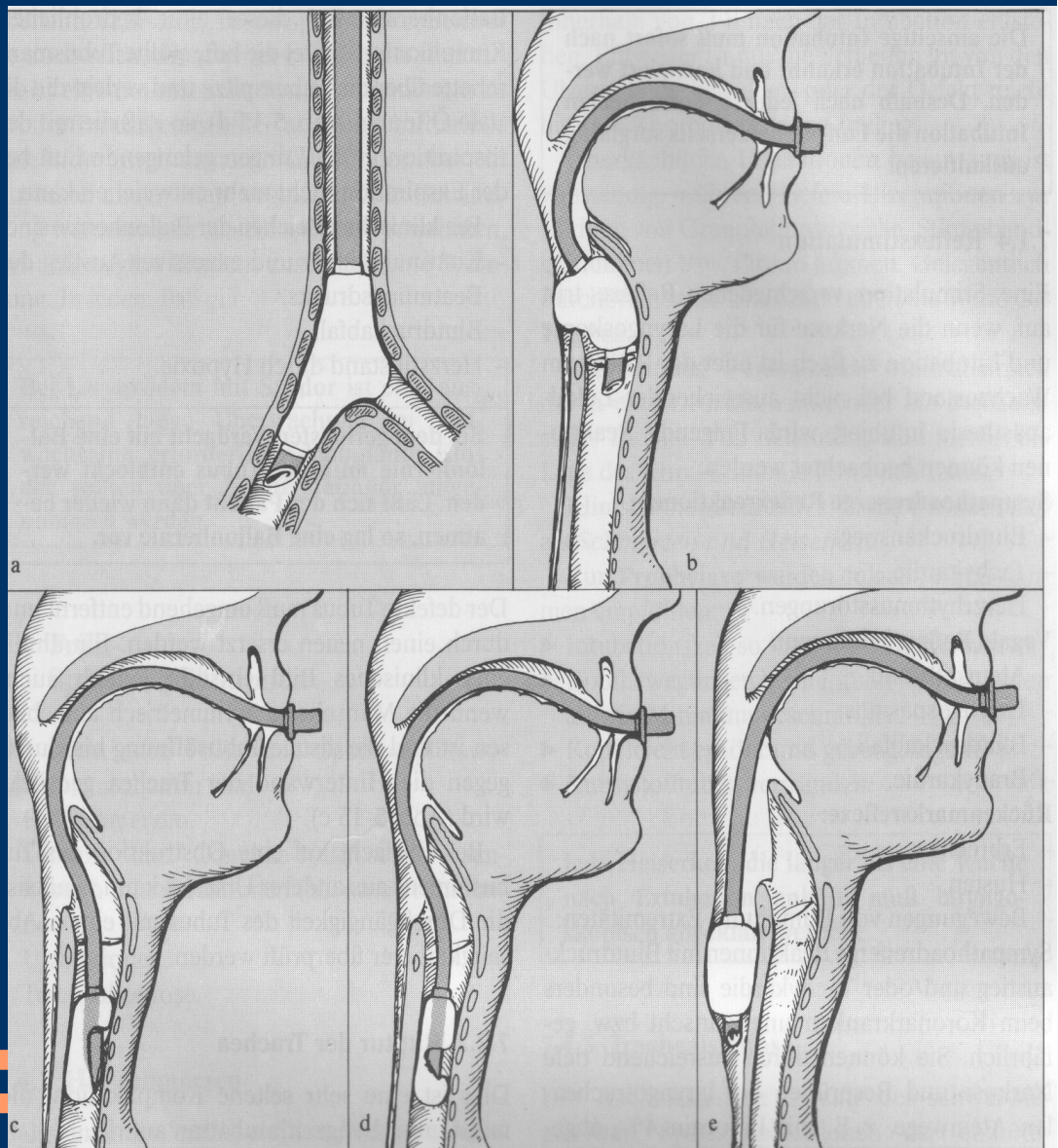
- pressure over larynx - right and down

Verify placing of the tube

- auscultation
- End tidal CO2
- fibroskopic view

Complications of TI - early:

- trauma of teeth, soft tissue
- placed to esophagus / endobronchialy
- aspiration
- cardiovascular - ↑BP, ↑f, arrhythmia
- ↑ICP
- laryngospasmus, bronchospasmus



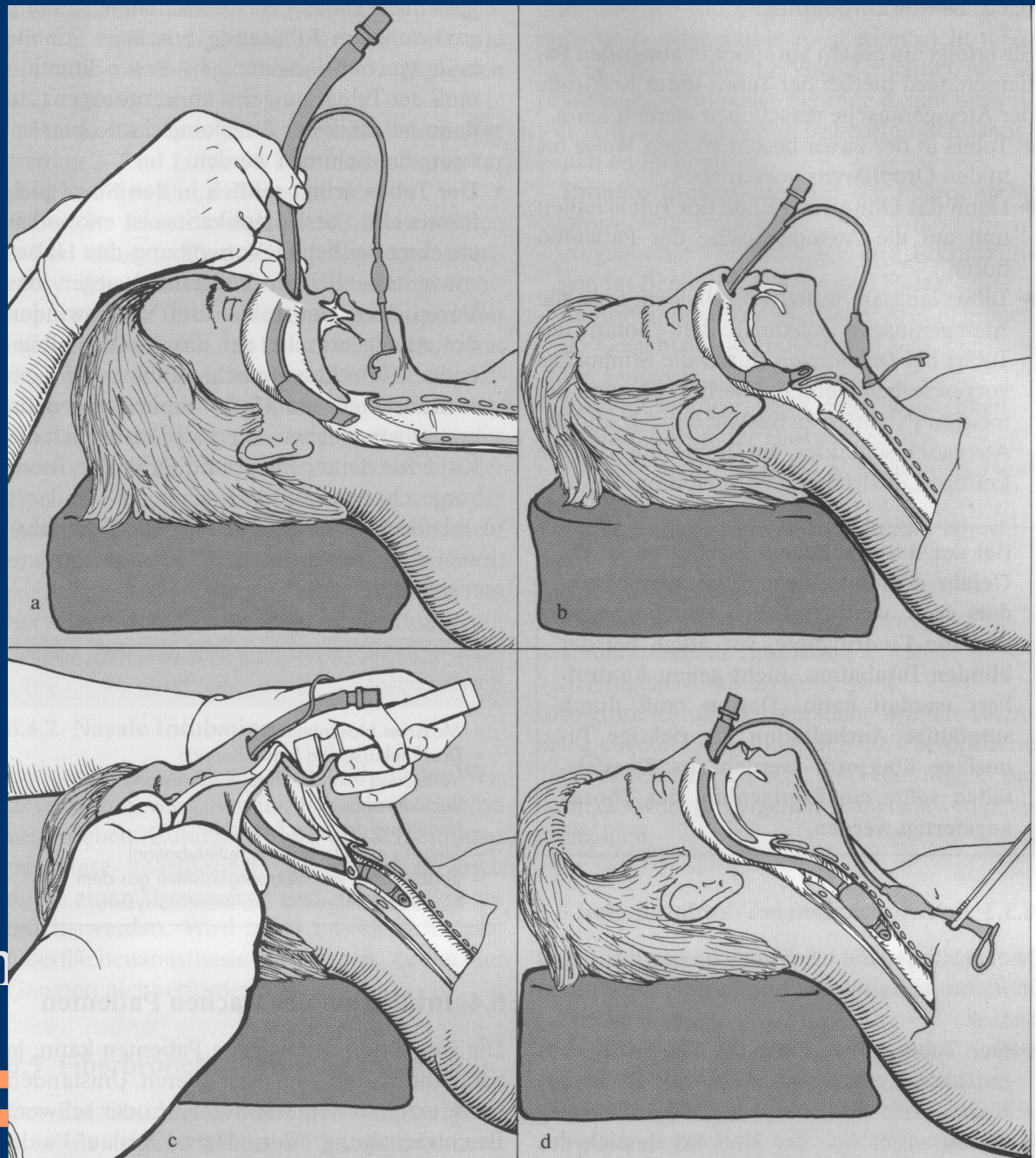
Complication of TI - later:

- damage of vocal cords, trachea
- sinusitis, otitis,
- decubitus – lip, nose
- obturation of tracheal tube by secret, blood

How to do NTI:

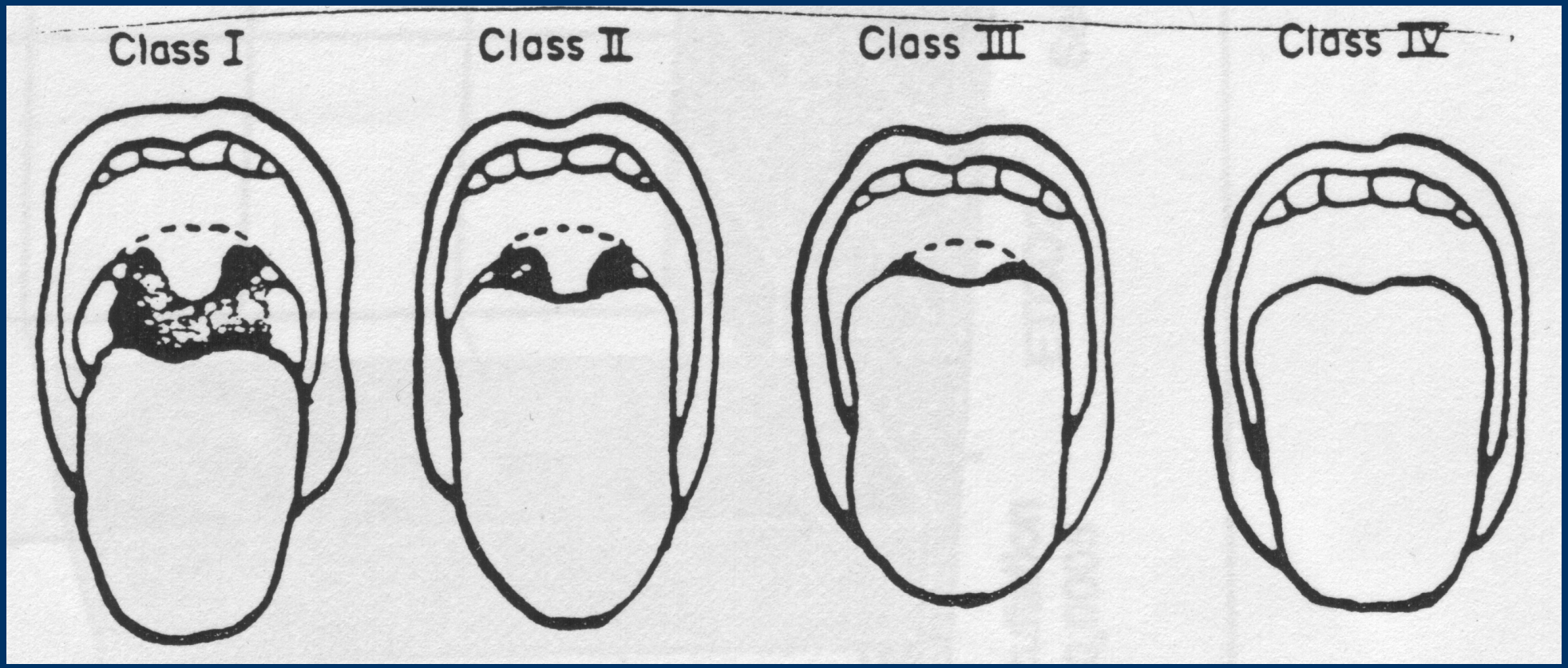
- LA anemisation of nose
- tube through nose
- placing tube under visual control

CAVE:
deviation of septum nasi



Check your neck

- Mallanpati



- 3-3-2

RSI

- Rapid Sequence of Intubation
- Rapid Sequence of Induction

RSI indication

- full stomach
- unknown time of starving
- GE reflux
- gastroparesis
- analgetics

RSI - sequence

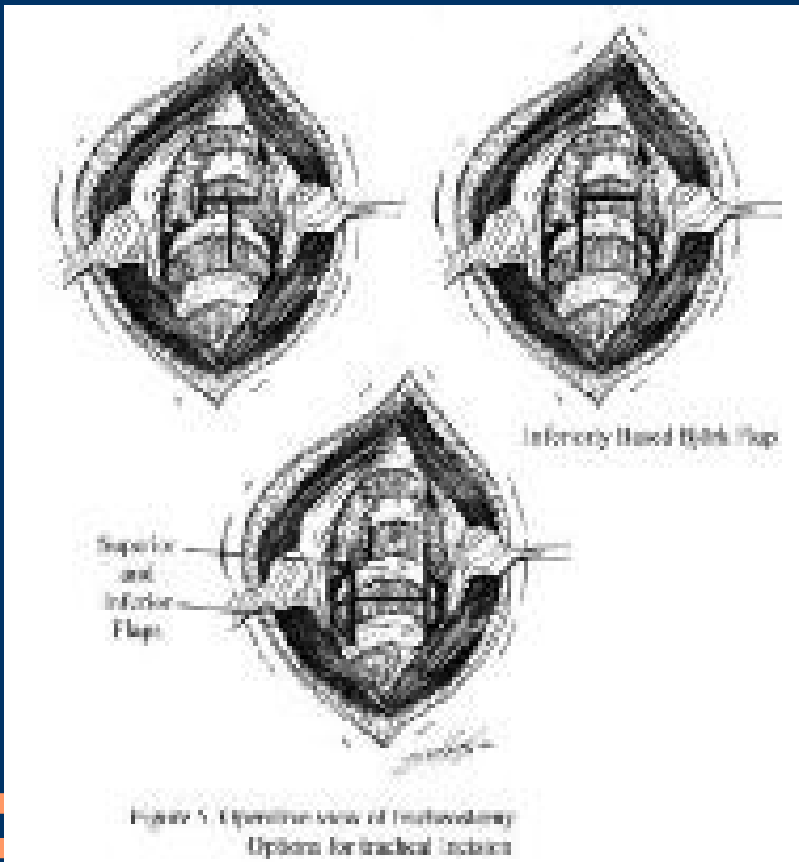
- Preox + i.v. line, working suction
- induction = propofol, SchJ
- Sellick maneuver + OTI
- confirmation
- fixation by tape

- be ready for 2 l of gastric content

Tracheotomy

- surgical access to trachea
- punction TS

- I: maintain AW long time
  - artificial ventilation
  - limitation of dead space



Difficult Airway

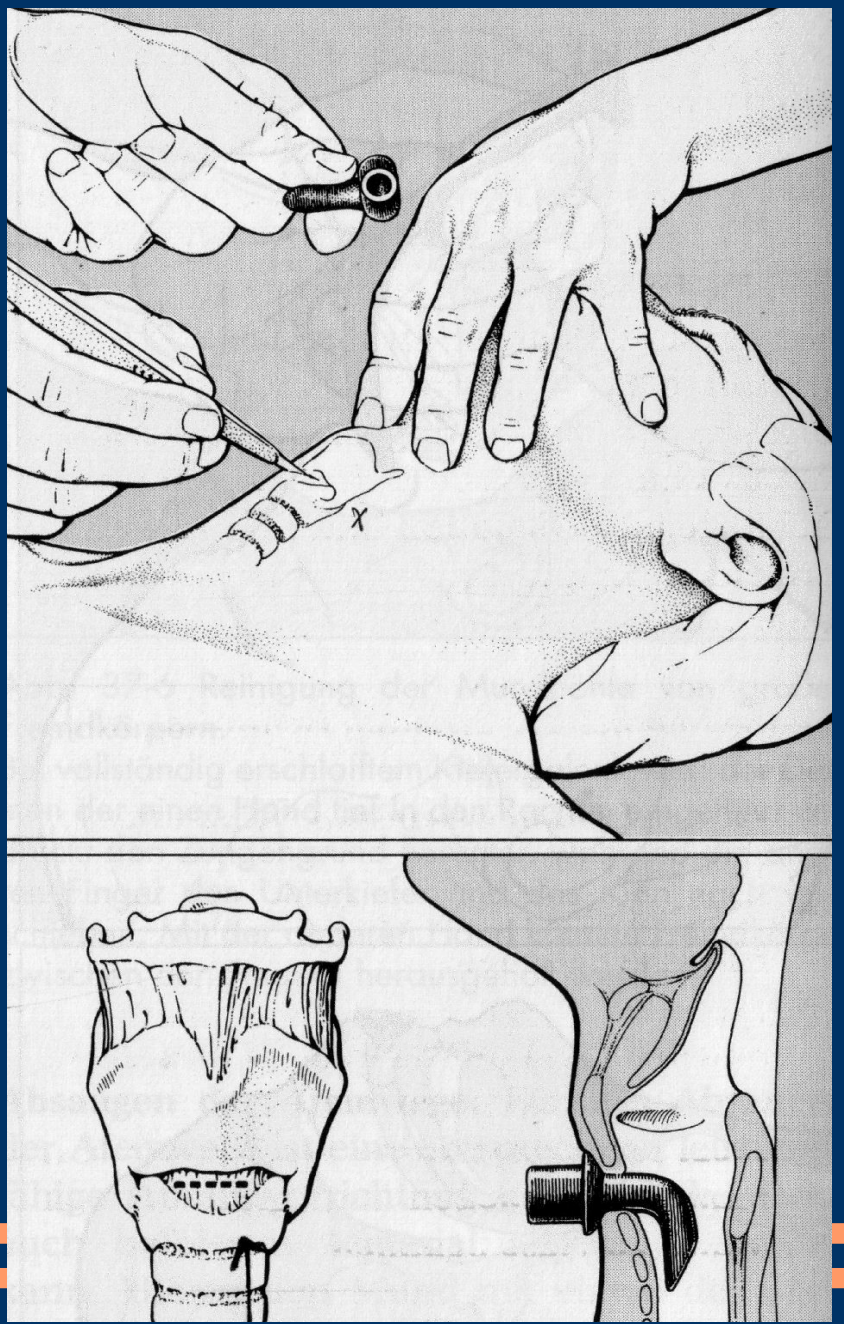
- Anticipated
  - awake intubation – bronchoscope
  - (TS)
- Unanticipated
  - spont. vent. / paralyzed

Alternative Equipment

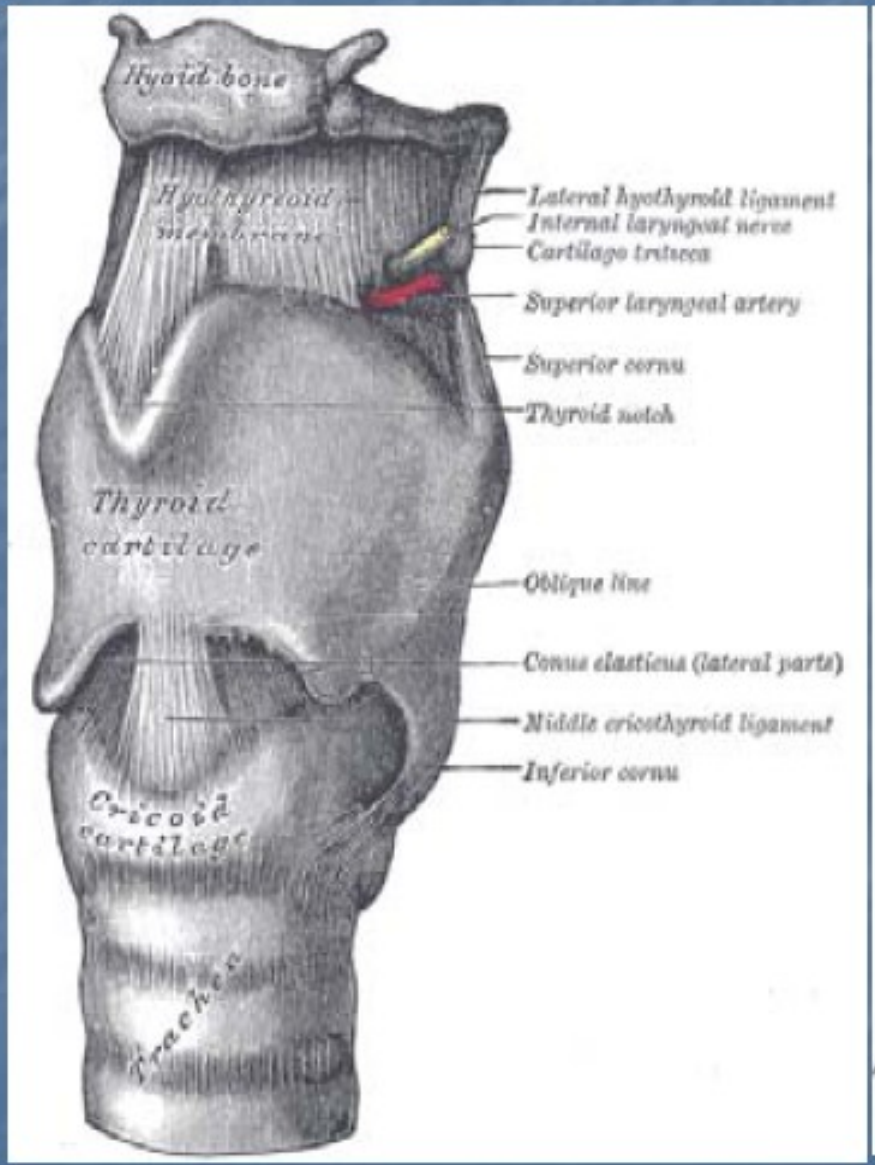
- VideoLaryngoskop
- C-trach
- fibroscope

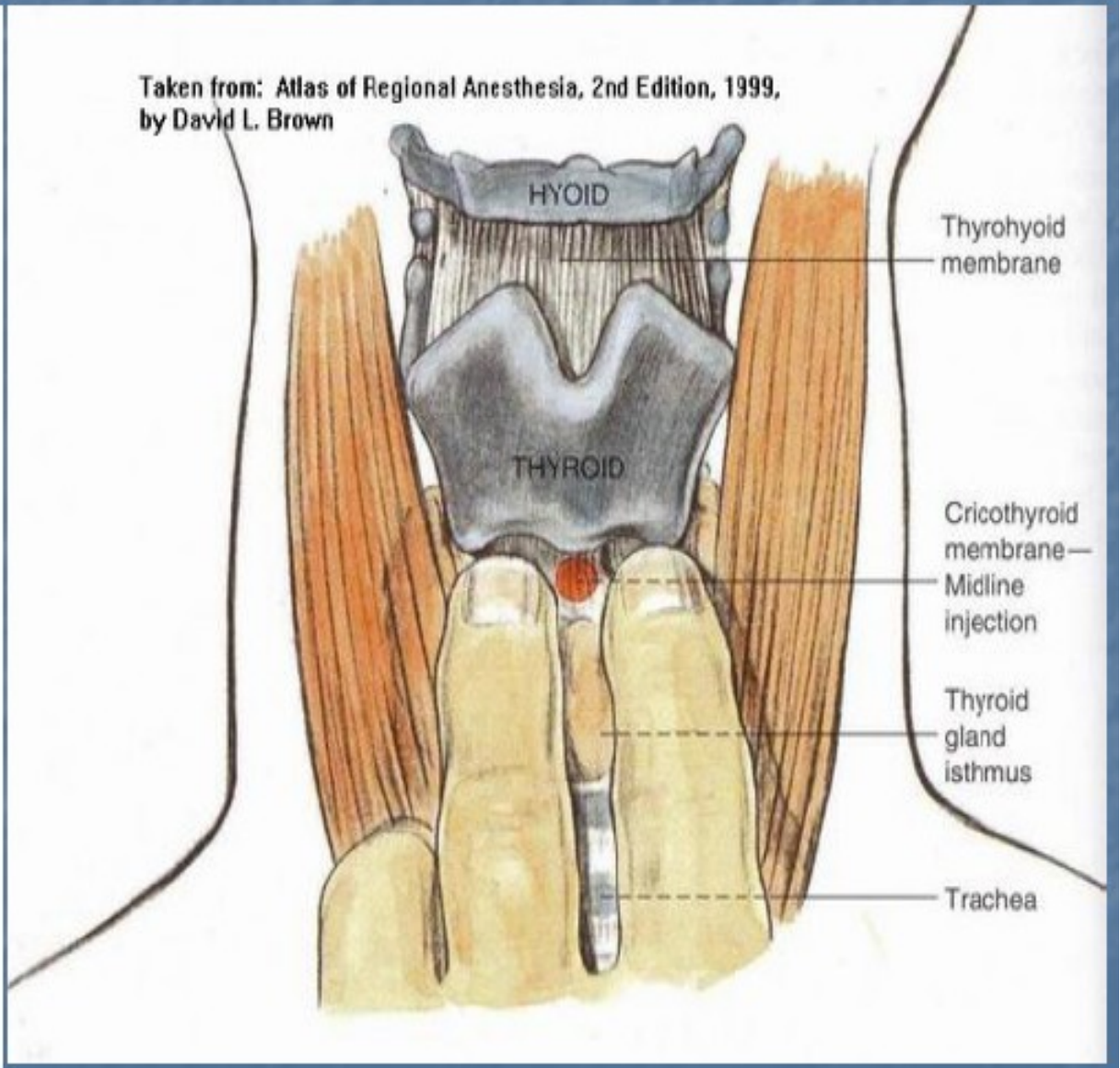
Coniotomy

- urgent access to airway
- lig. cricothyreoideum (lig. conicum)



Where is the Cric Membrane ?





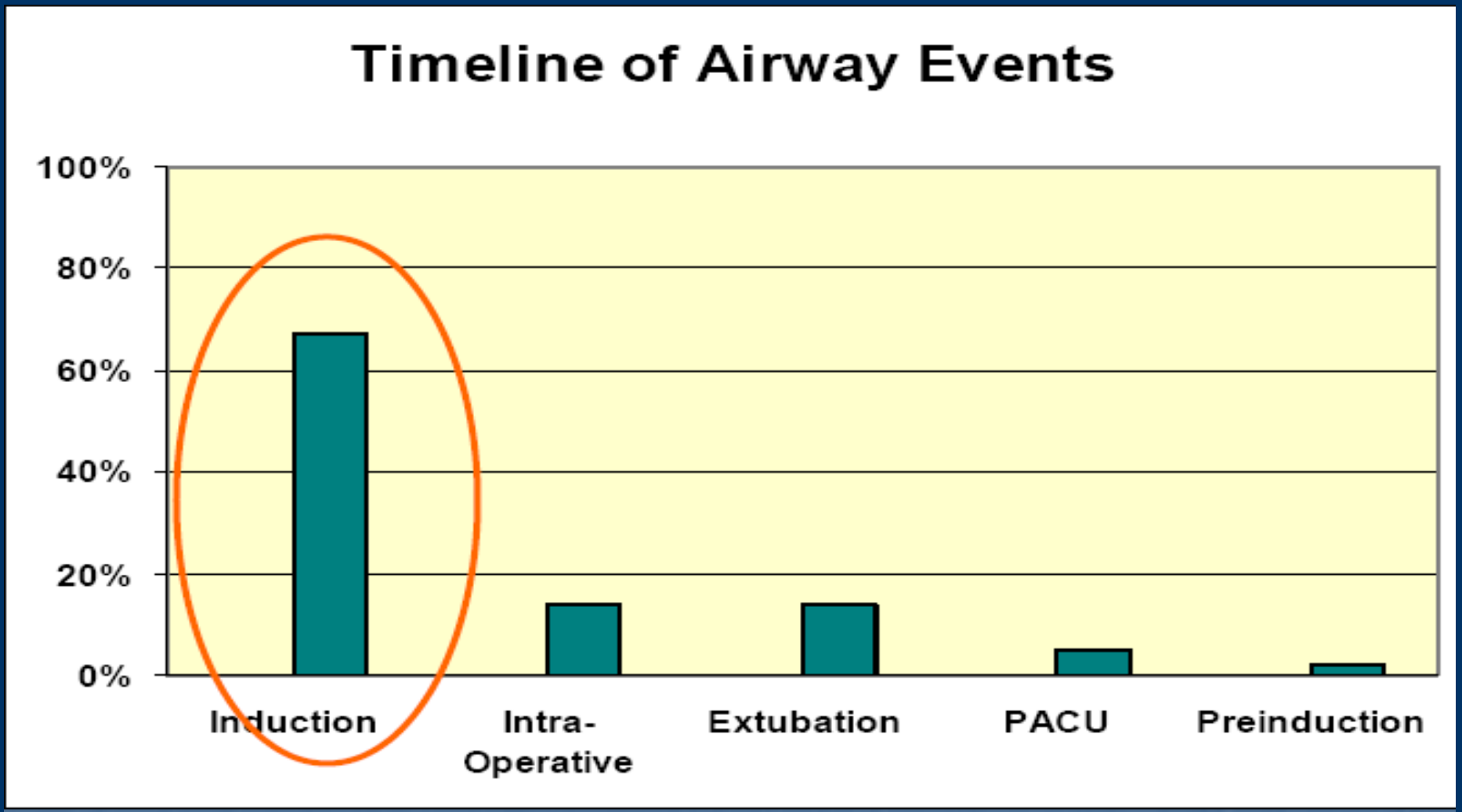
- Catheter over needle technique was quicker.

- Seldinger technique

Coniotomy

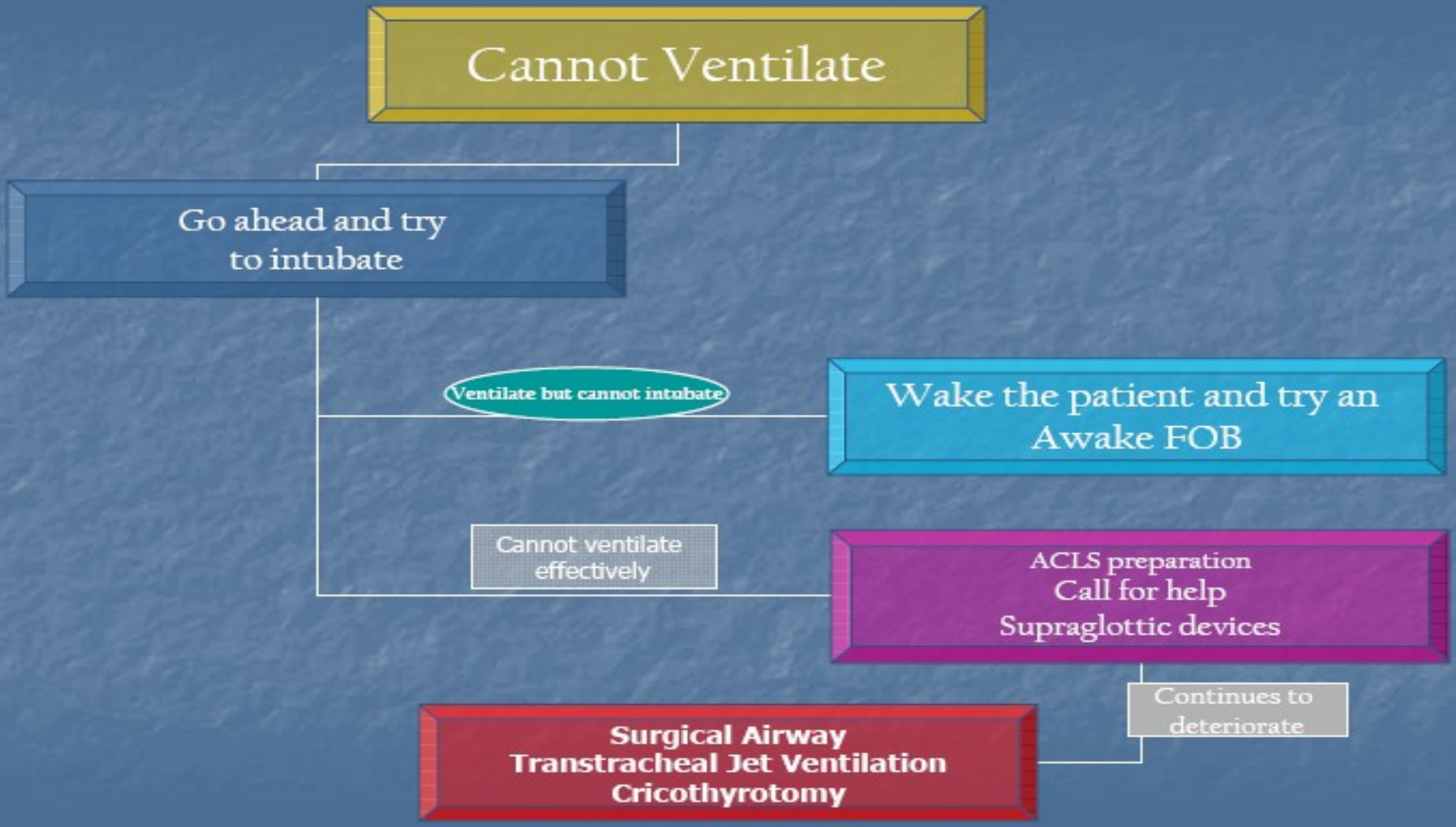
- First try OTI
- find the ligament
- DO it.

Time of Airway Events



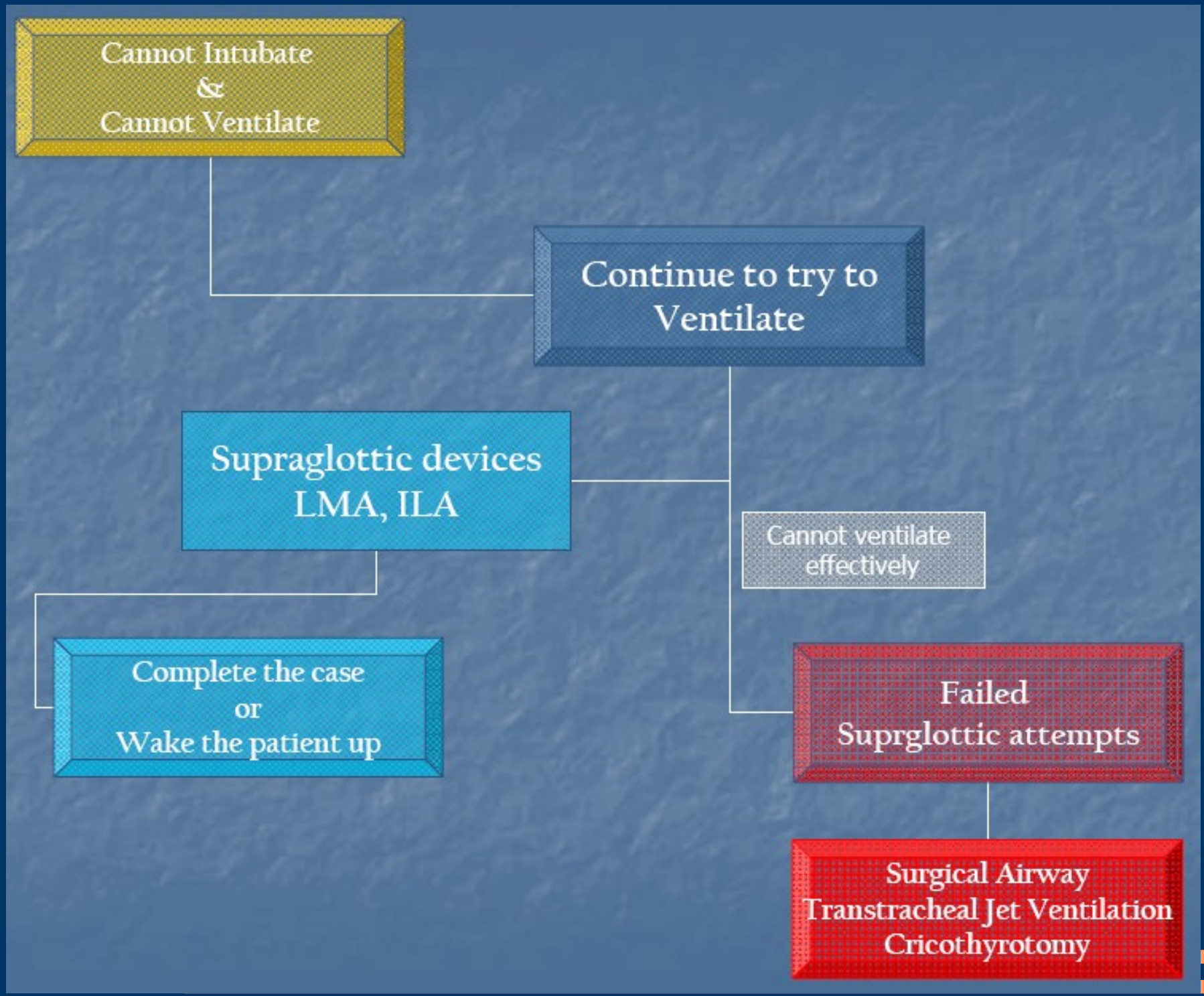
Reference: *Management of the Difficult Airway in Closed Malpractice Claims*
By Peterson et al. (University of Washington)

Cannot ventilate



Cannot intubate, can ventilate

- keep ventilation
- call for help


Cannot Intubate
&
Cannot Ventilate
Continue to try to Ventilate
Supraglottic devices
LMA, ILA
Cannot ventilate effectively
Complete the case
or
Wake the patient up
Failed
Suprglottic attempts
Surgical Airway
Transtracheal Jet Ventilation
Cricothyrotomy

Cannot ventilate, can not intubate + full stomach

When you are out of your comfort zone.....

Remember

- Ventilation will likely save your patient.....
- Supraglottic airway
- If this does not work...Surgical Airway

Remember Bad things happen...

- When anesthesiologists persisted with ineffective airway maneuvers without moving down the decision tree.....
- Laryngoscopy › 3 attempts

Survey of Anesthesiology:50:2,2006

Summary

- Preop exam – allways
- History
- ready to awake intubation
- sooner fibroscopic OTI

- Have a plan
- Surgical access takes max 90 s

Extubation:

- contact
- clear orofarynx (sekretions, stoped bleeding)
- keeps haed 5s above bed / hand grip
- good pain controle
- minimal ET concentration of inhal. anesthetics

Fastrach

C-trach