

# Intubation, Venous Access

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ARK FNUSA

## Maintaining airway

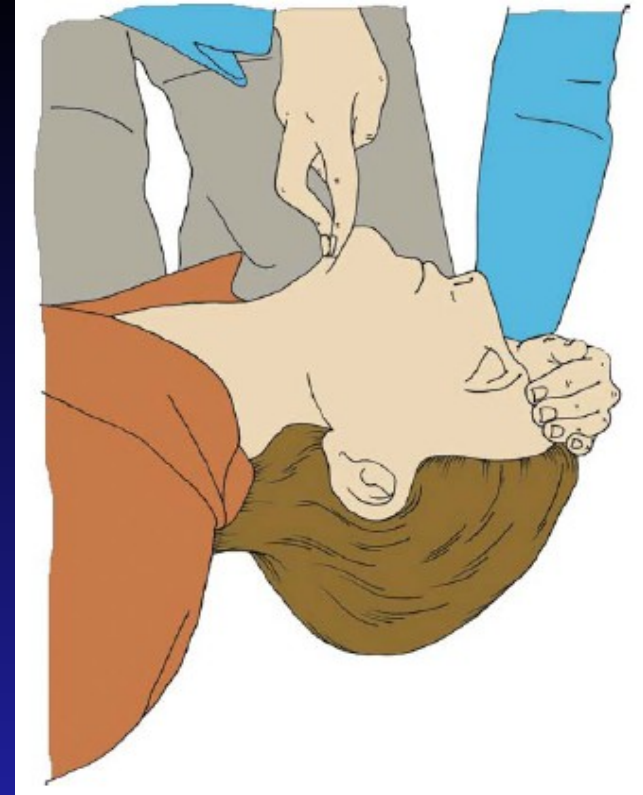
- Noninvasive
  - airway
  - laryngeal mask
  - combitube
- invasive
  - OTI, NTI
  - coniotomy
  - tracheotomy



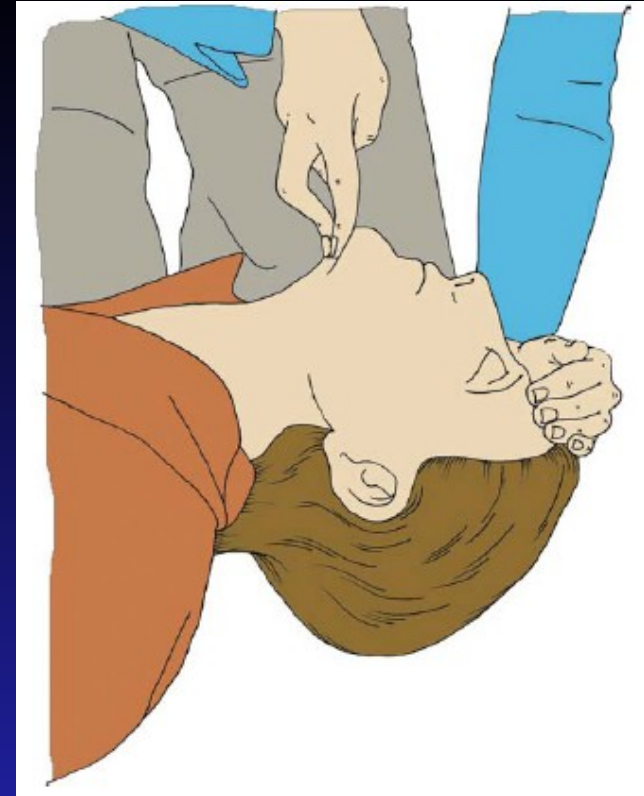
vocal  
cords

## First Aid - repetition

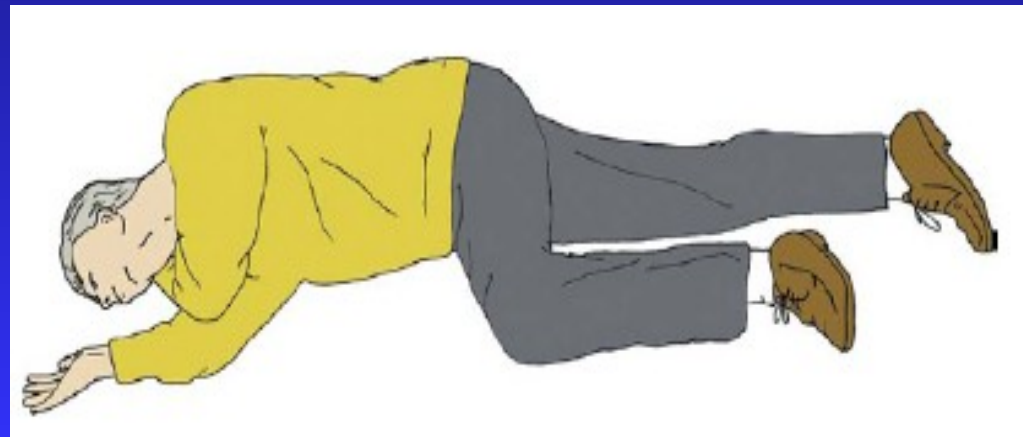
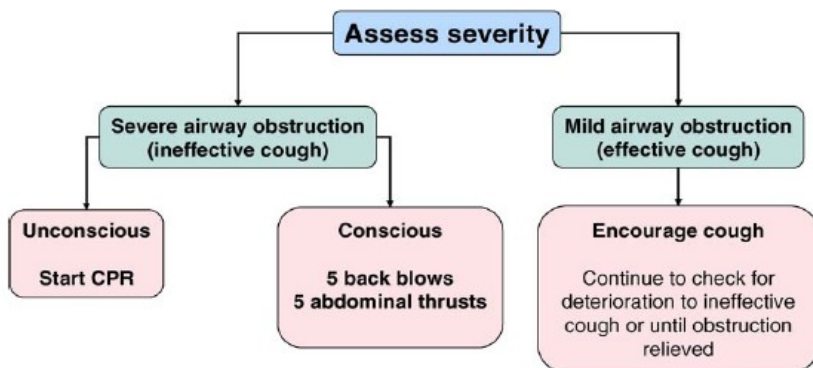
- FBAO



# First Aid - repetition



## Adult FBAO Treatment

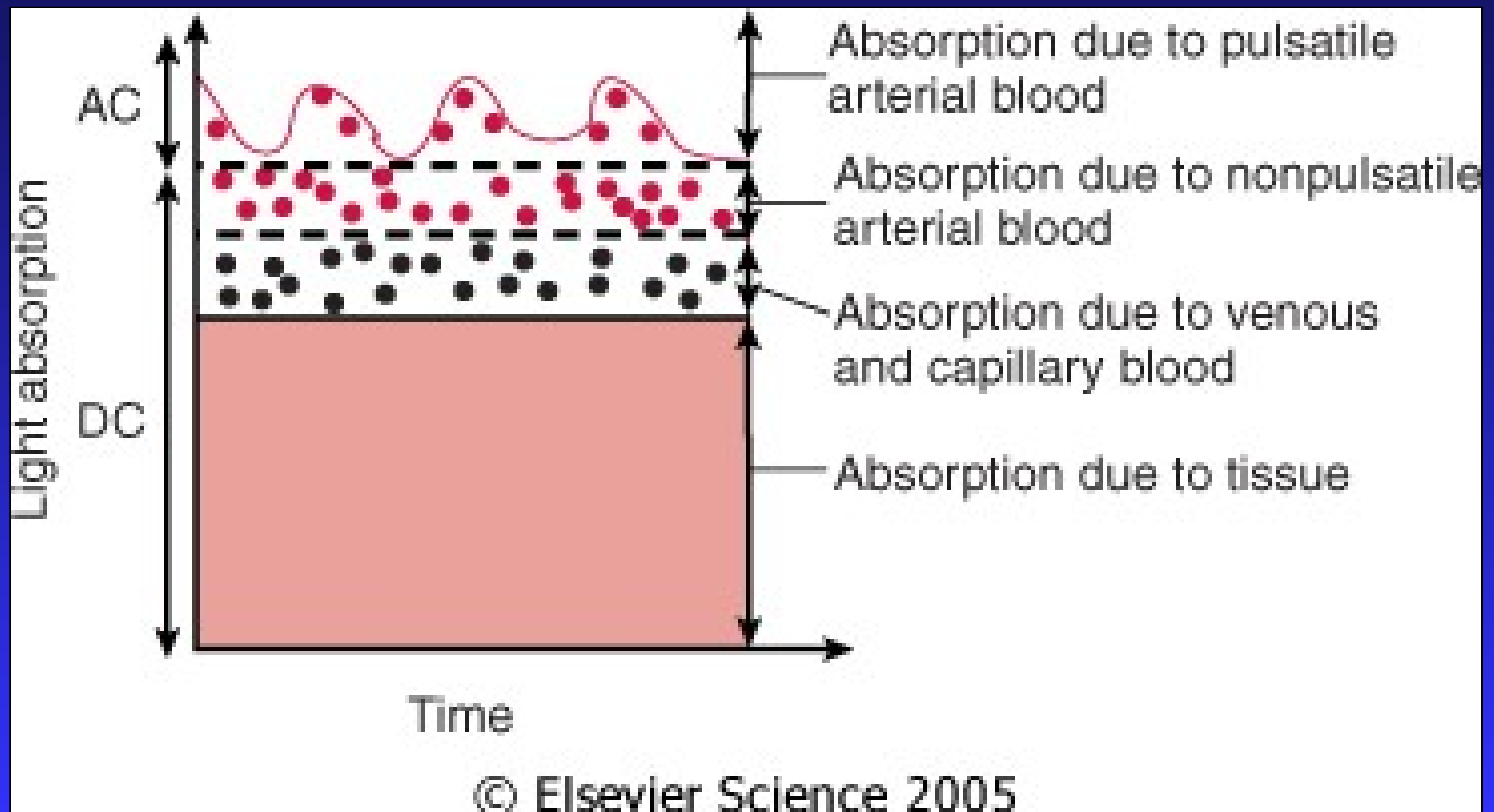


# Monitoring of breathing

- Auscultation lung + neck
- SpO<sub>2</sub>
- capnography / capnometry
- (arterial) blood gasses = Astrup

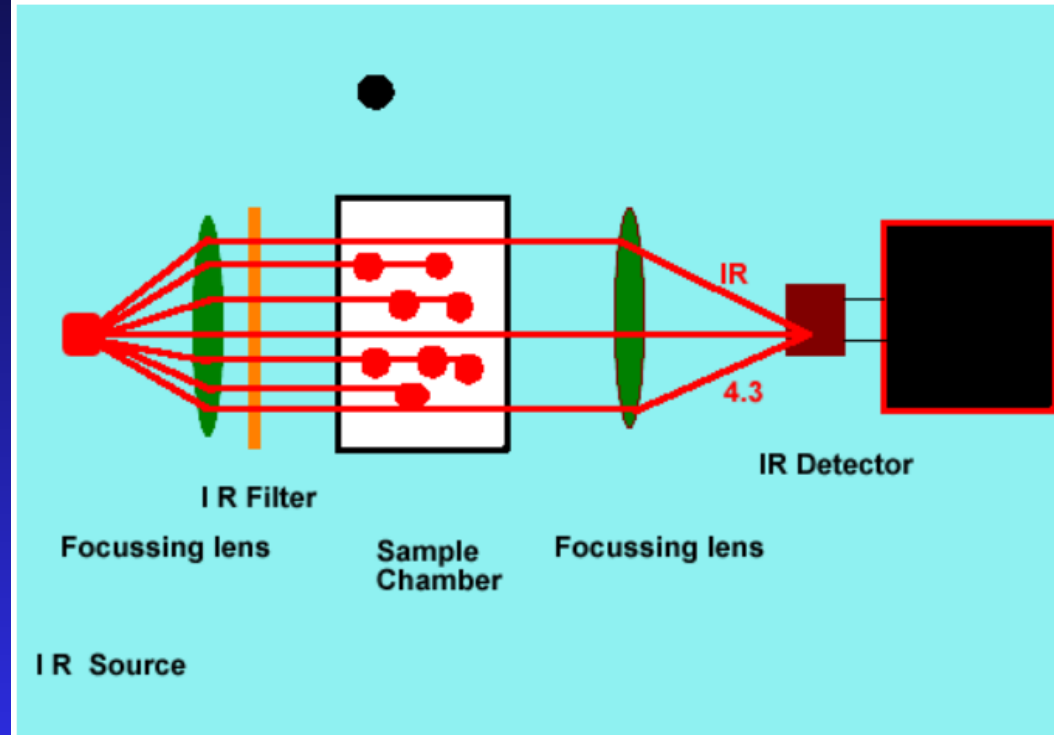


SpO<sub>2</sub> > 90%



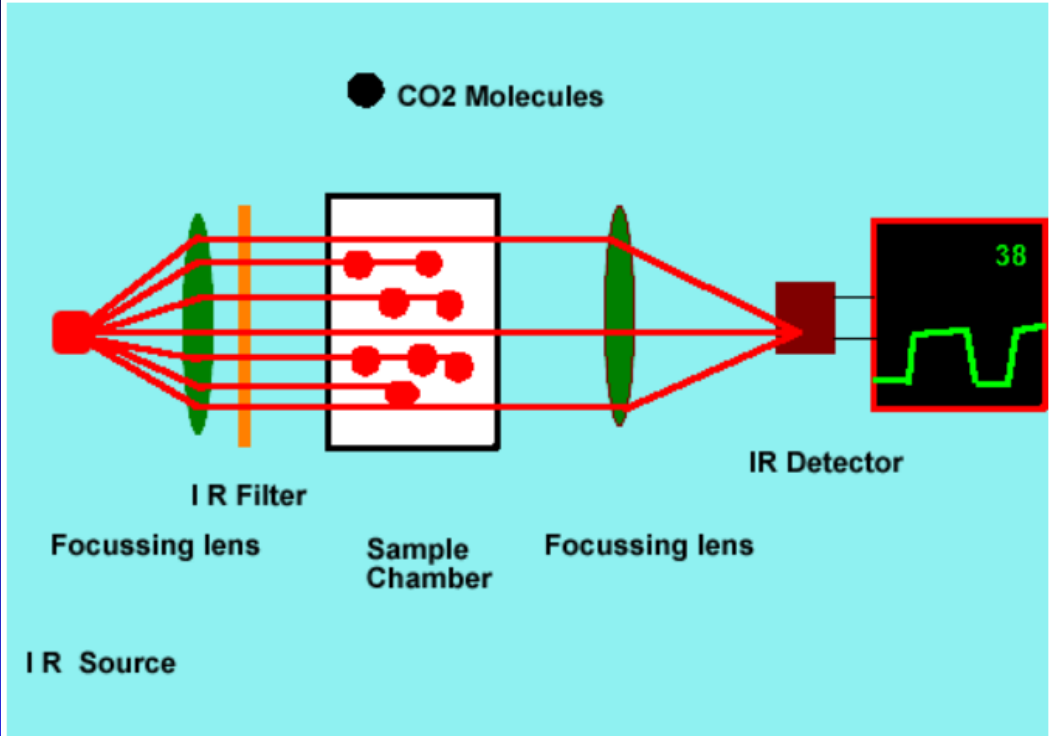
# CO<sub>2</sub>

CO<sub>2</sub> absorbs Infra red light at 4.3  $\mu\text{m}$



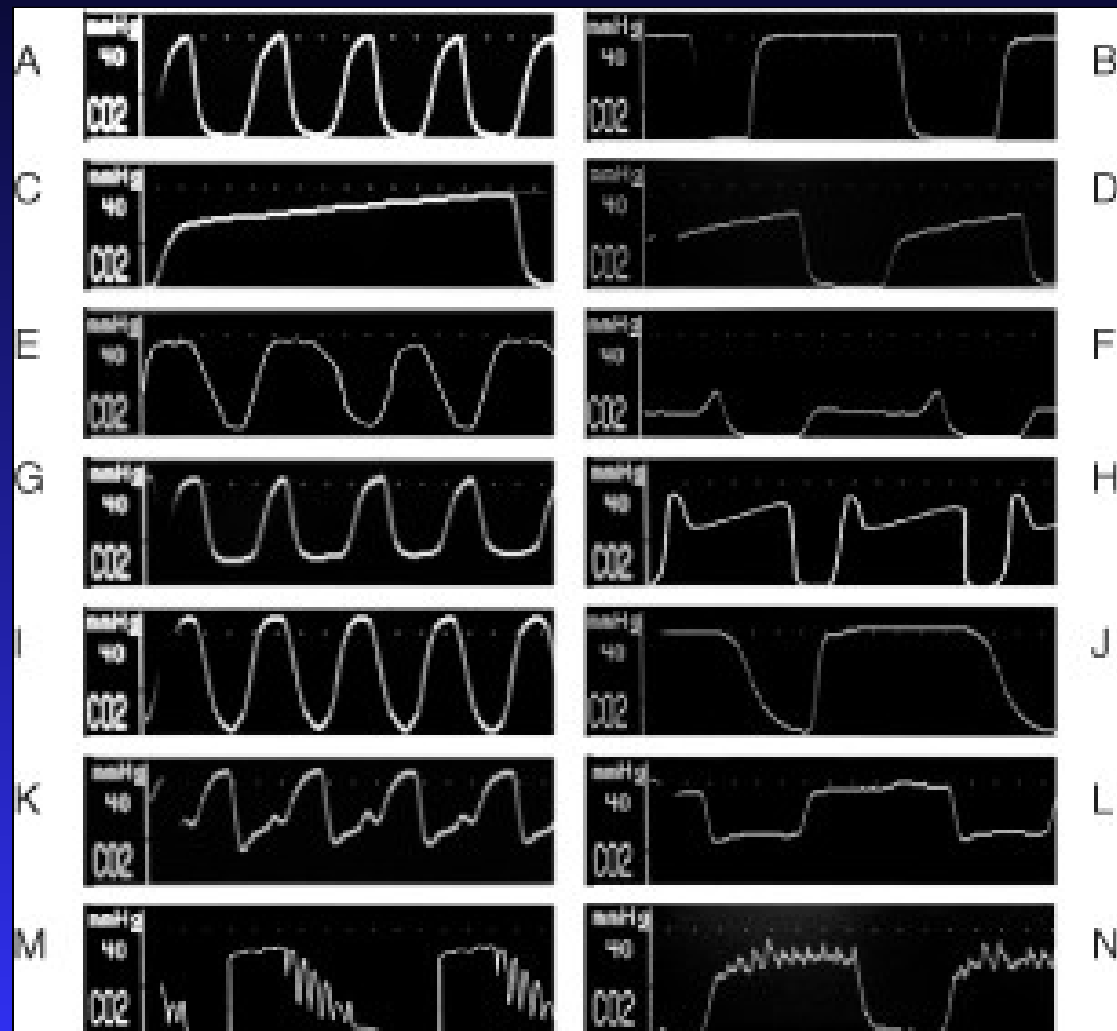
# CO<sub>2</sub>

CO<sub>2</sub> absorbs Infra red light at 4.3 μm





# Kapnograf



# Ventilace obličejovou maskou



I: zástava dechu, dechová nedostatečnost

- dýchání pozitivním přetlakem
- dechový objem 6ml/kg = pohyb hrudníku  
f 10.. 30 /min  
100% O<sub>2</sub>

1 ruka:

- palec, ukazováček
  - 3 prsty za čelist
- 2 rukama, 3 rukama



# OroPharyngeal Airway



I: unconsciousness

+ airway obstruction with tongue

Correct size OPA:

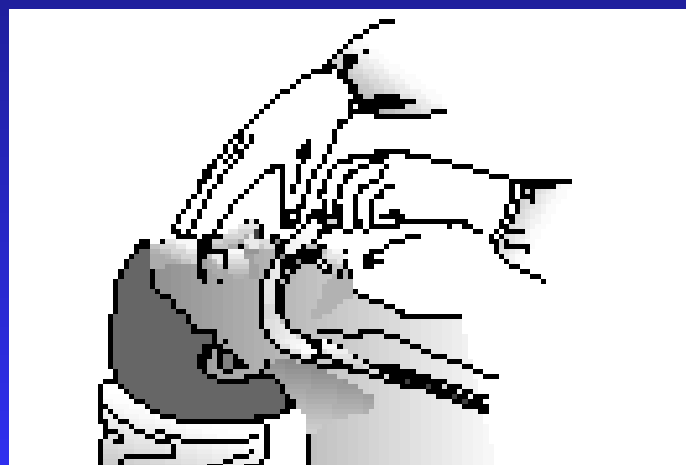
distance angle of mouth --- ear

Risk in mild unconsciousness:

vomit + aspiration



LM



## LM

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

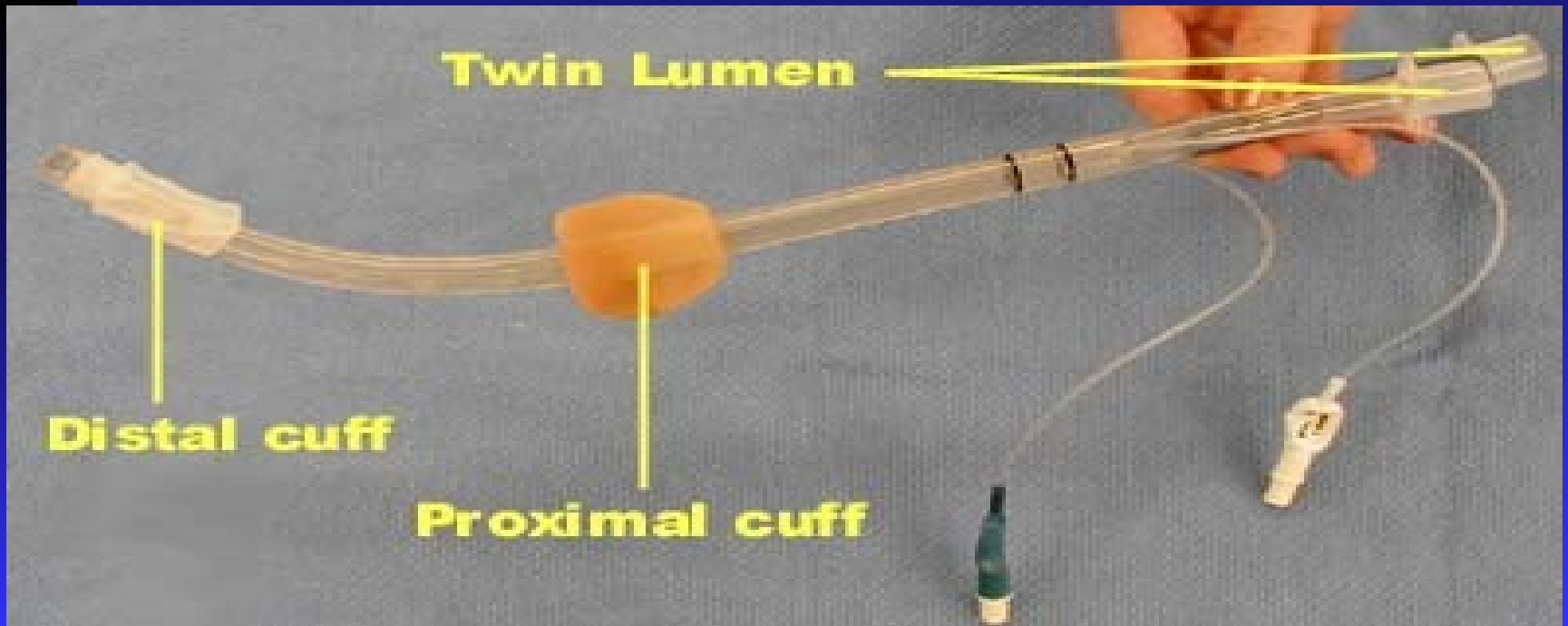
I: instead face mask, OTI, difficult airway

KI:

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

# Combitube

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



# Tracheal intubation

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

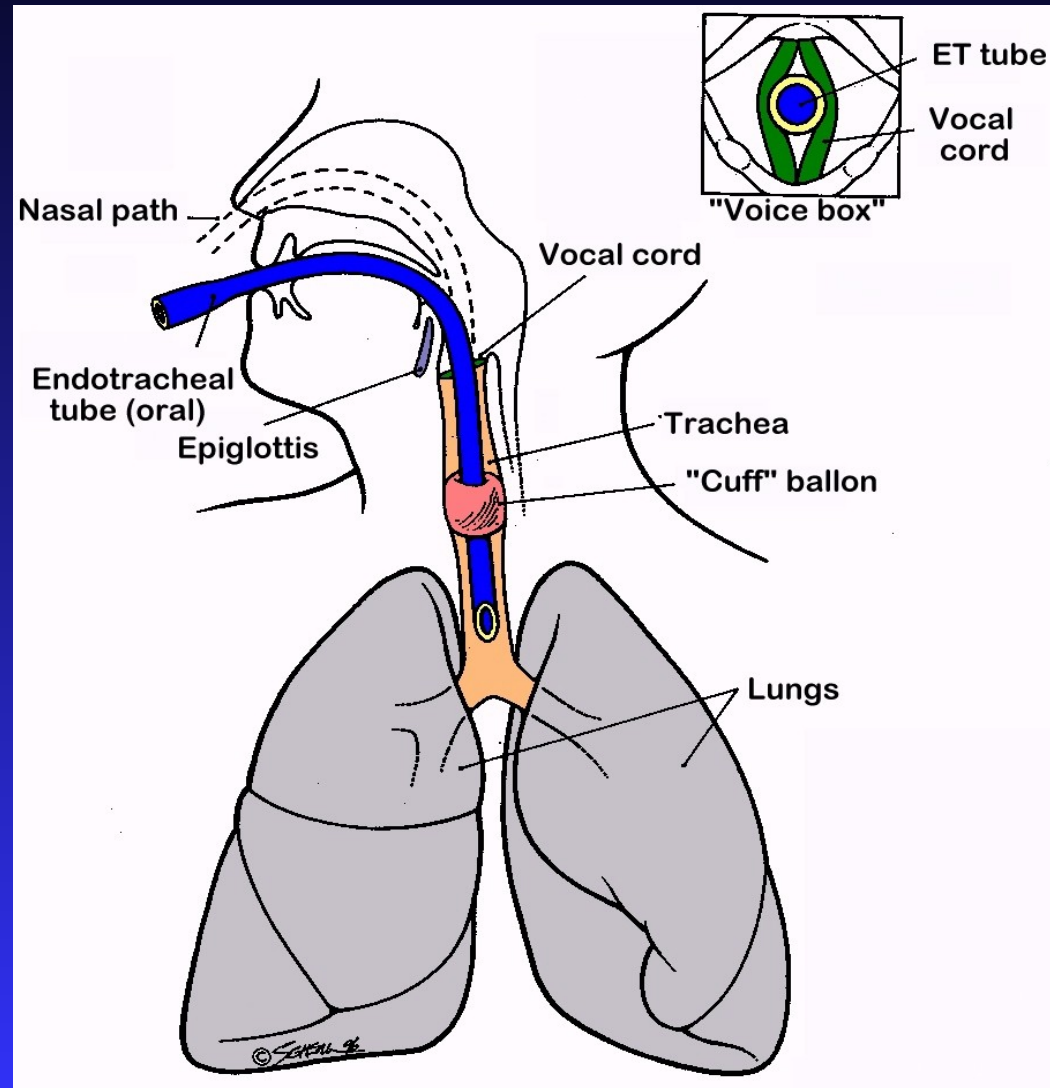
I:

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

**narrowest place in airway – vocal cords  
– subglottic space (<8let)**

## OTI, NTI - aids:

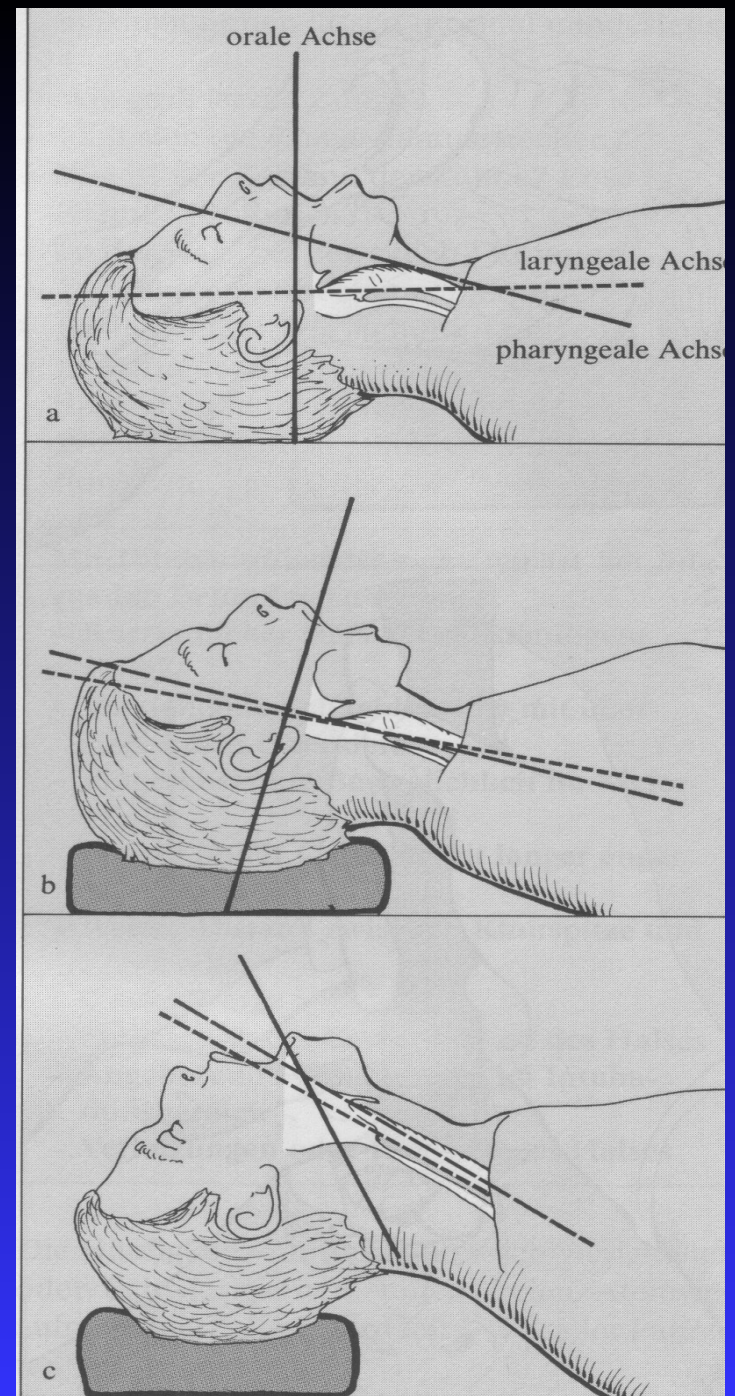
- laryngoscope
- Magill tongs
- tracheal tubes
- syringe
- lead



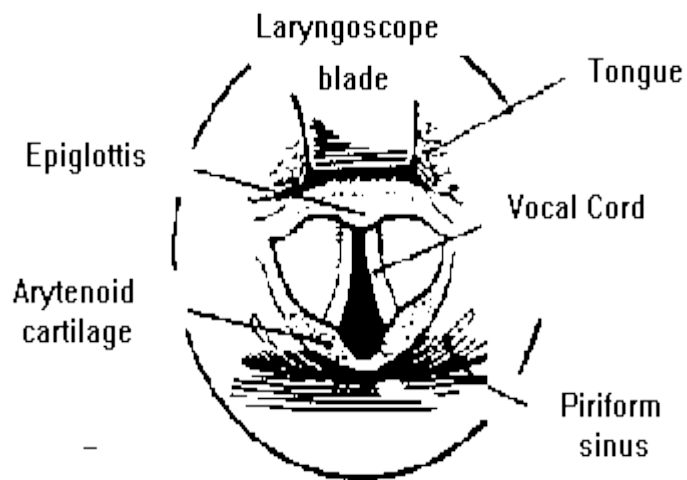
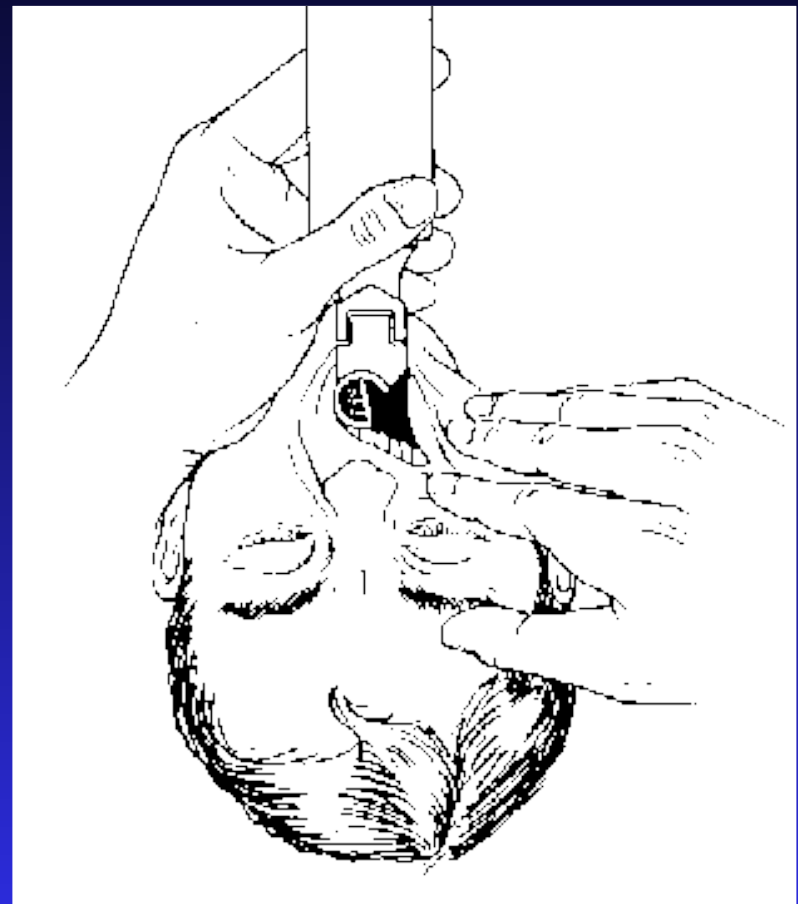
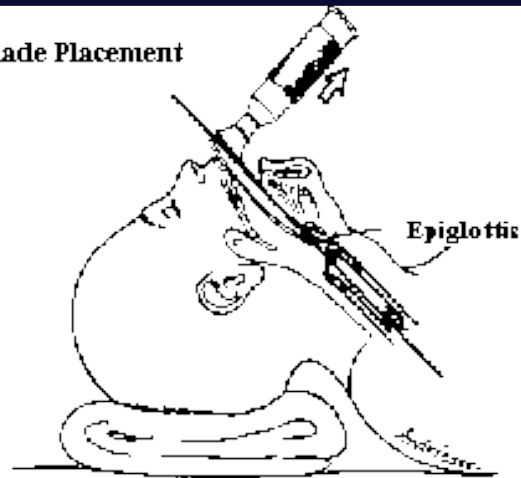


## How to:

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

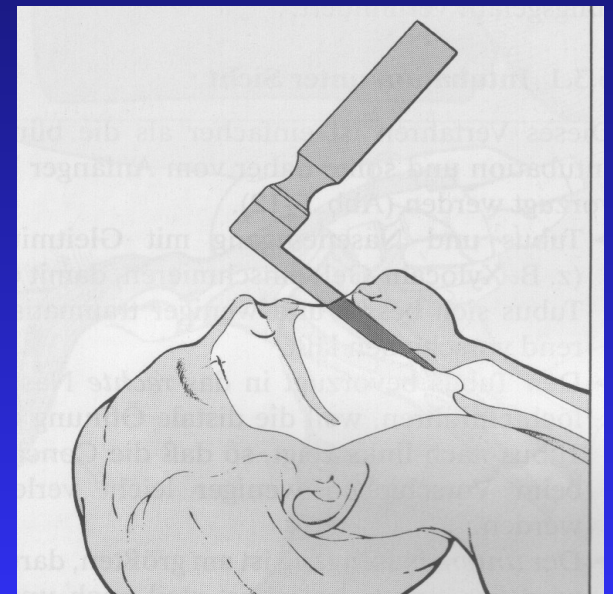
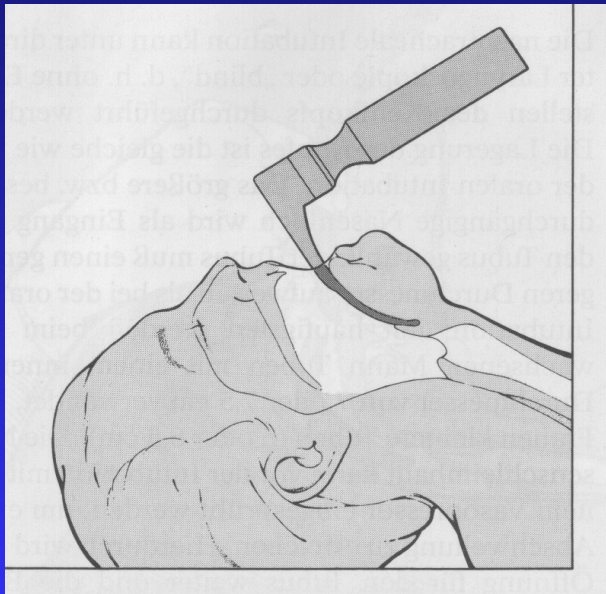
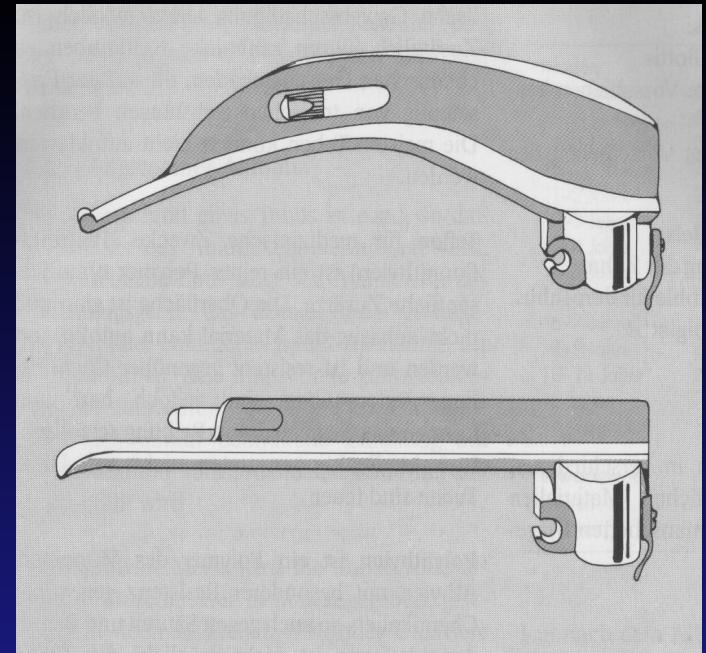


**Straight Blade Placement**

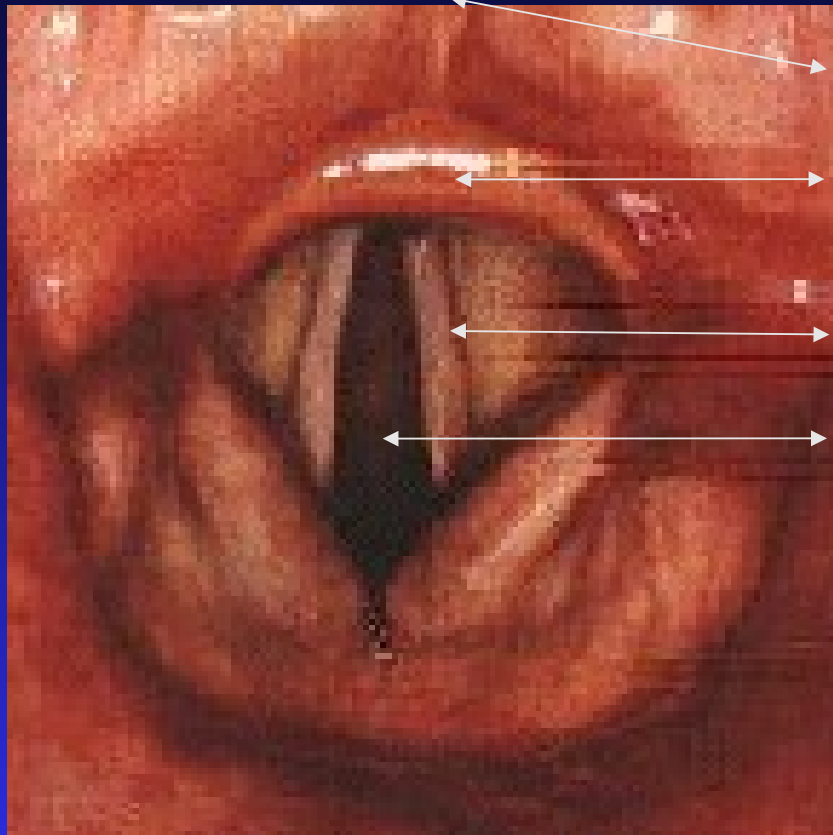


## Laryngoscope:

- crooked spoon - Macintosh
- straight spoon - Miller



## Laryngoscopic view:



radix of tongue

epiglottis

vocal cords

trachea

# Always easy? (Cormac & Lehane)

Grade I



Grade II



Grade III



Grade IV

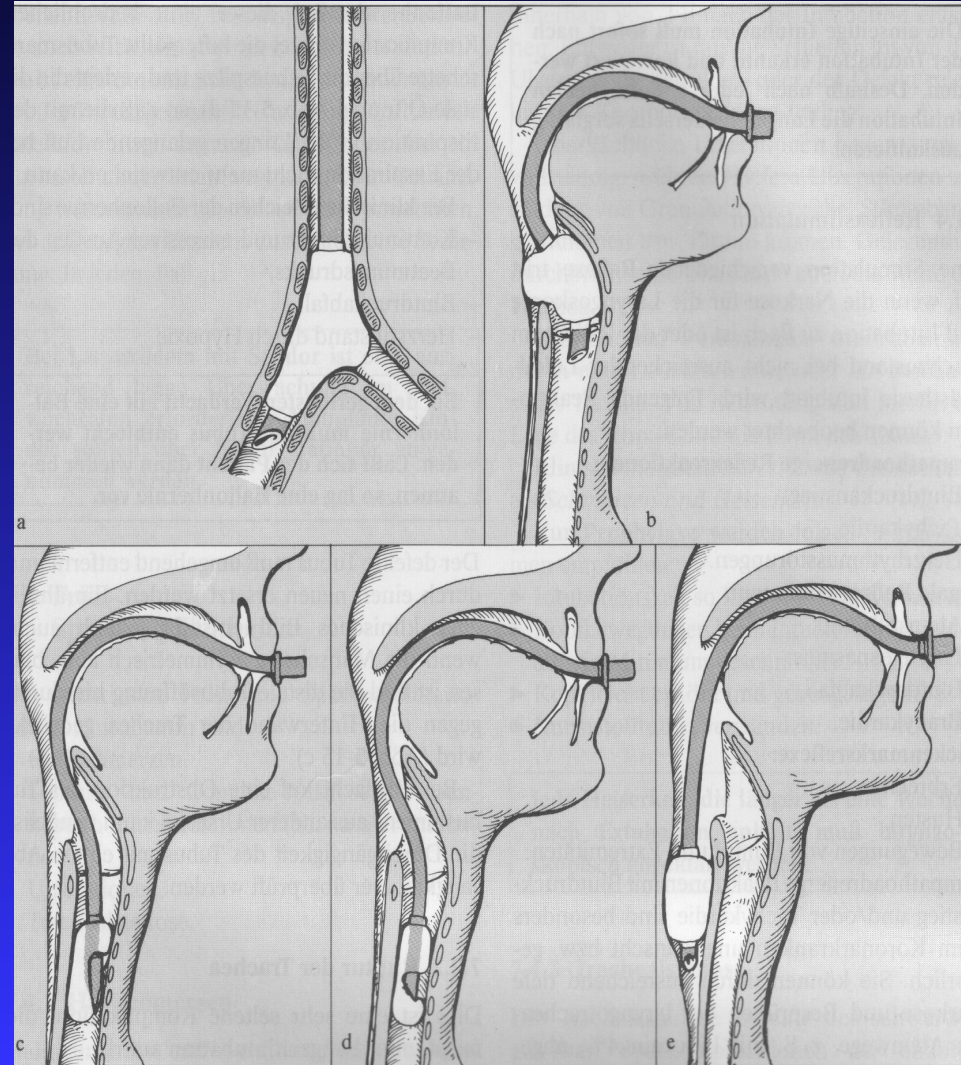


## Verify placing of the tube

- auscultation
- End tidal CO<sub>2</sub>
- 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:

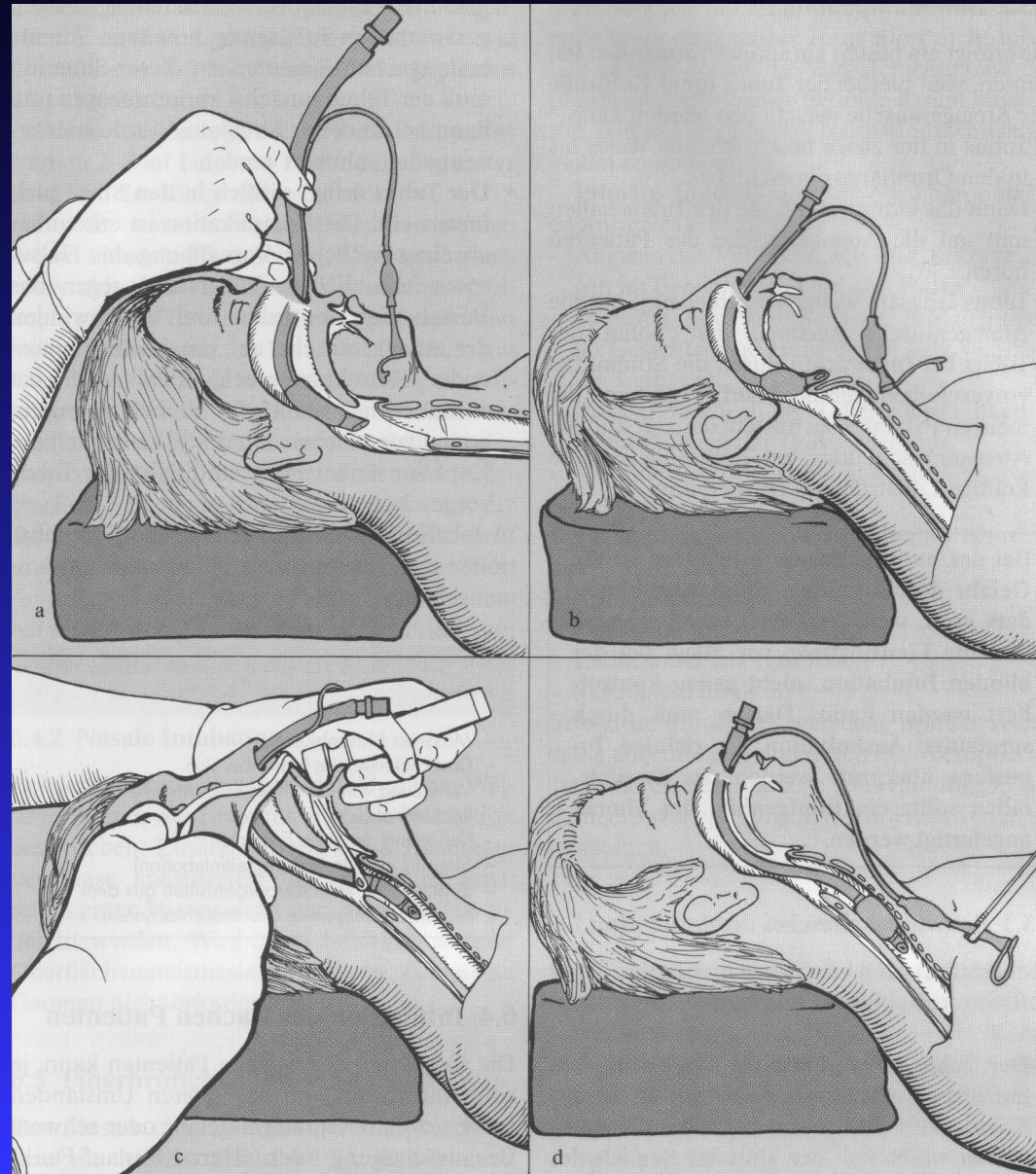
- damage of vocal cords, trachea
- sinusitis, otitis,
- decubitus – lip, nose
- obturation of tracheal tube by secret, blood



## How to do NTI:

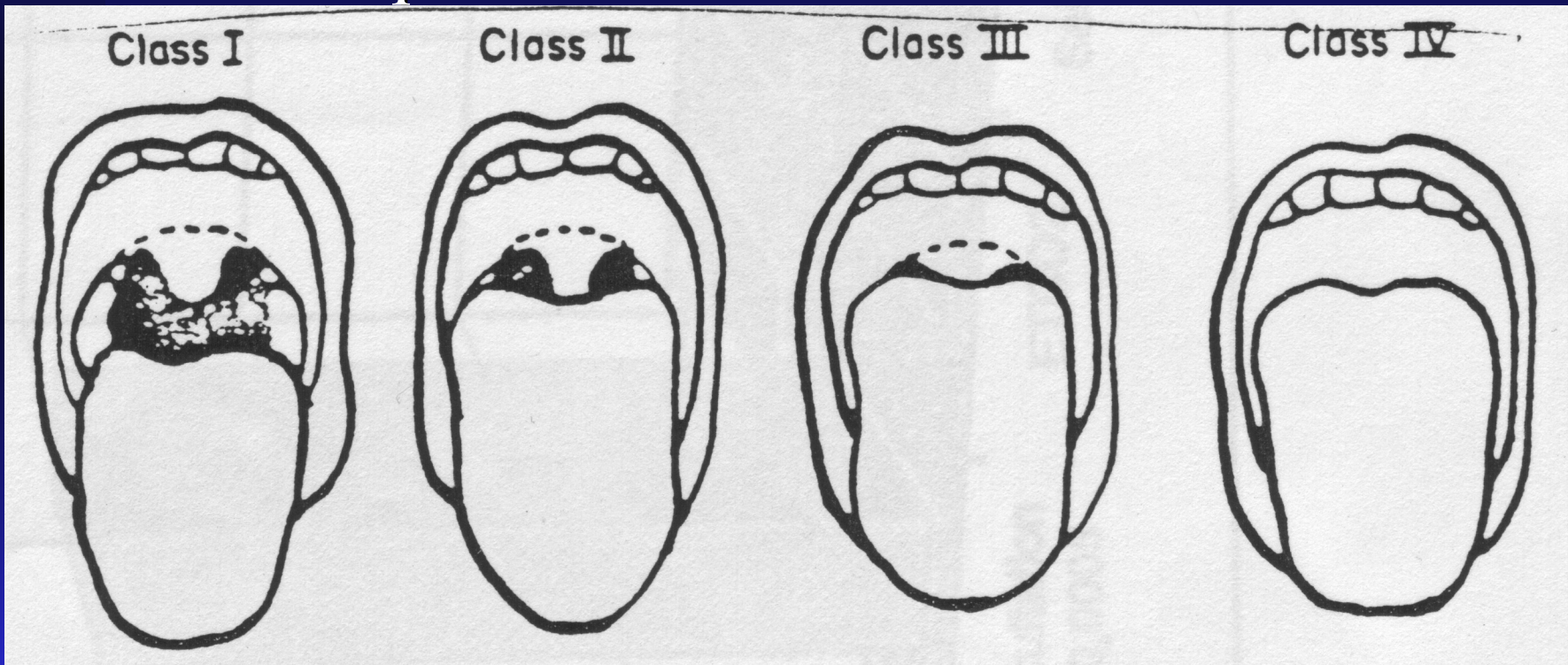
1. LA  
anemisation of  
nose
2. tube through nose
3. placing tube  
under visual  
control

**CAVE:**  
deviation of  
septum nasi



# Check your neck

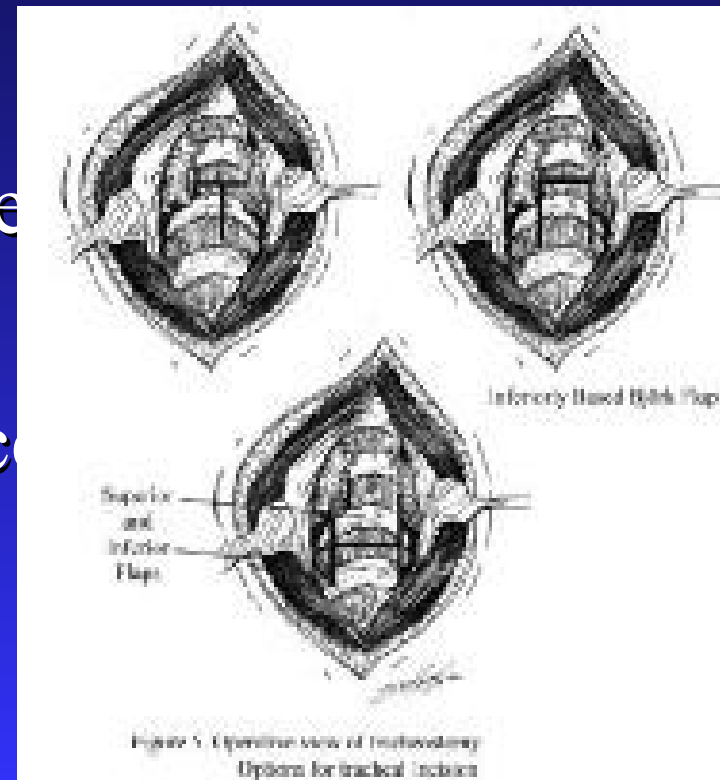
- Mallanpati



- 3-3-2

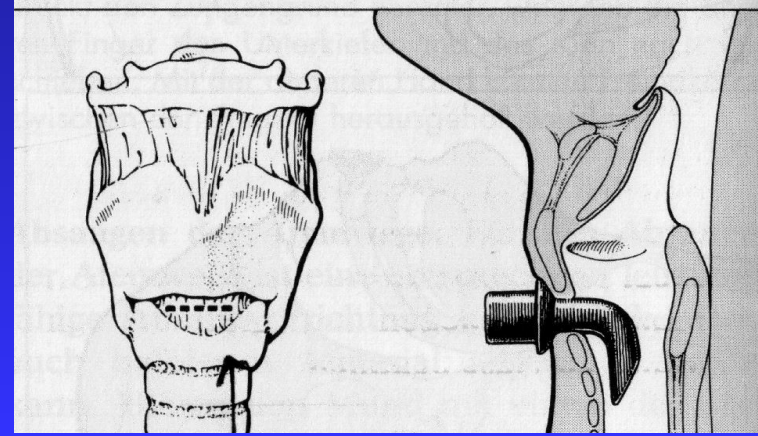
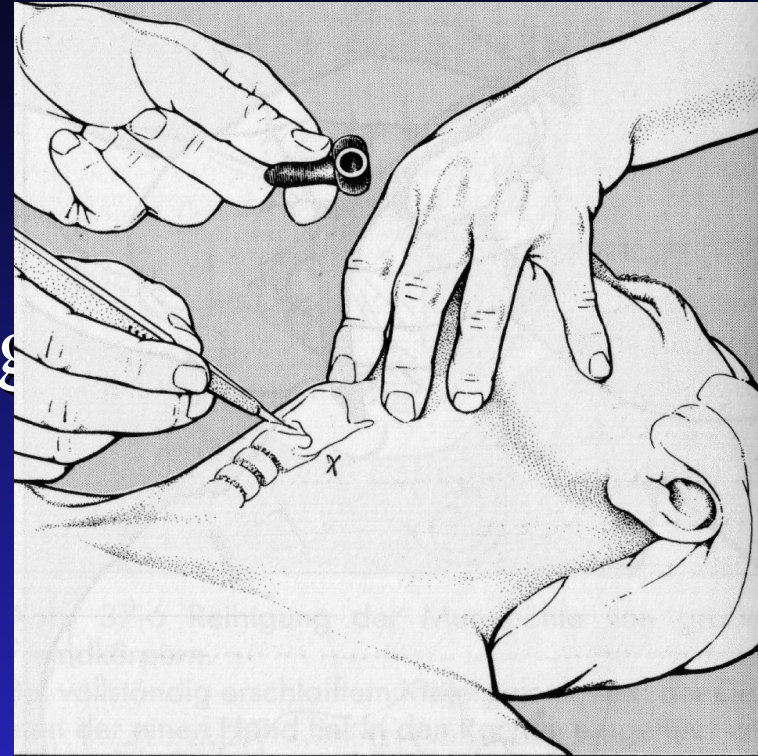
# Tracheotomy

- surgical access to trachea
- puncture TS
- I: maintain AW long time
  - artificial ventilation
  - limitation of dead space

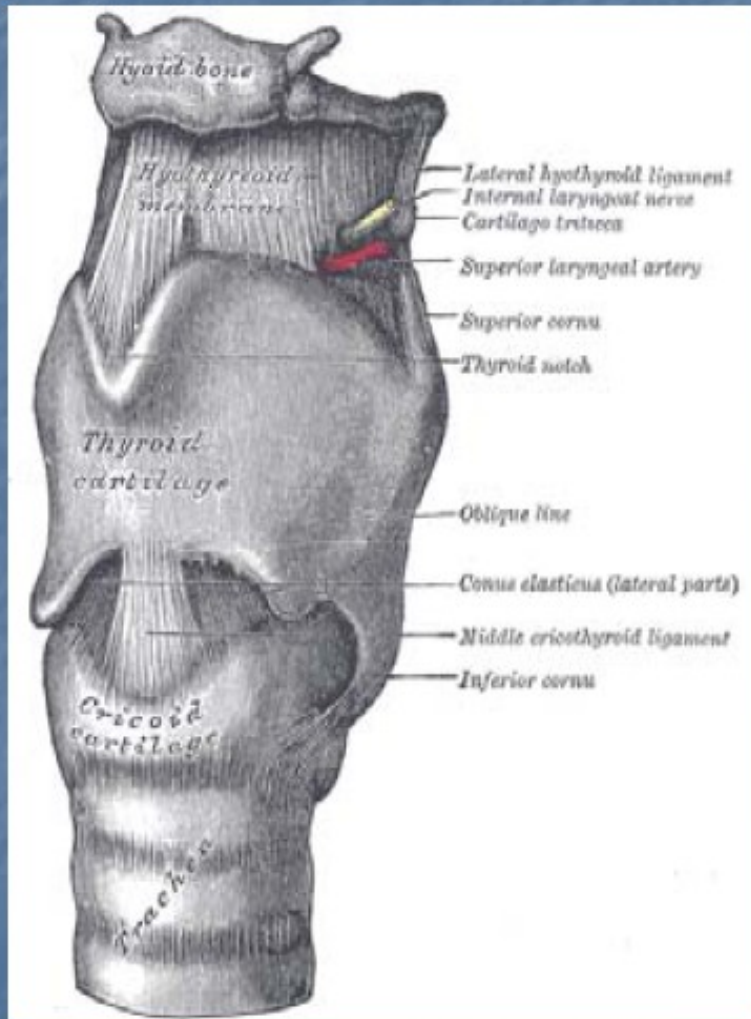


# Coniotomy

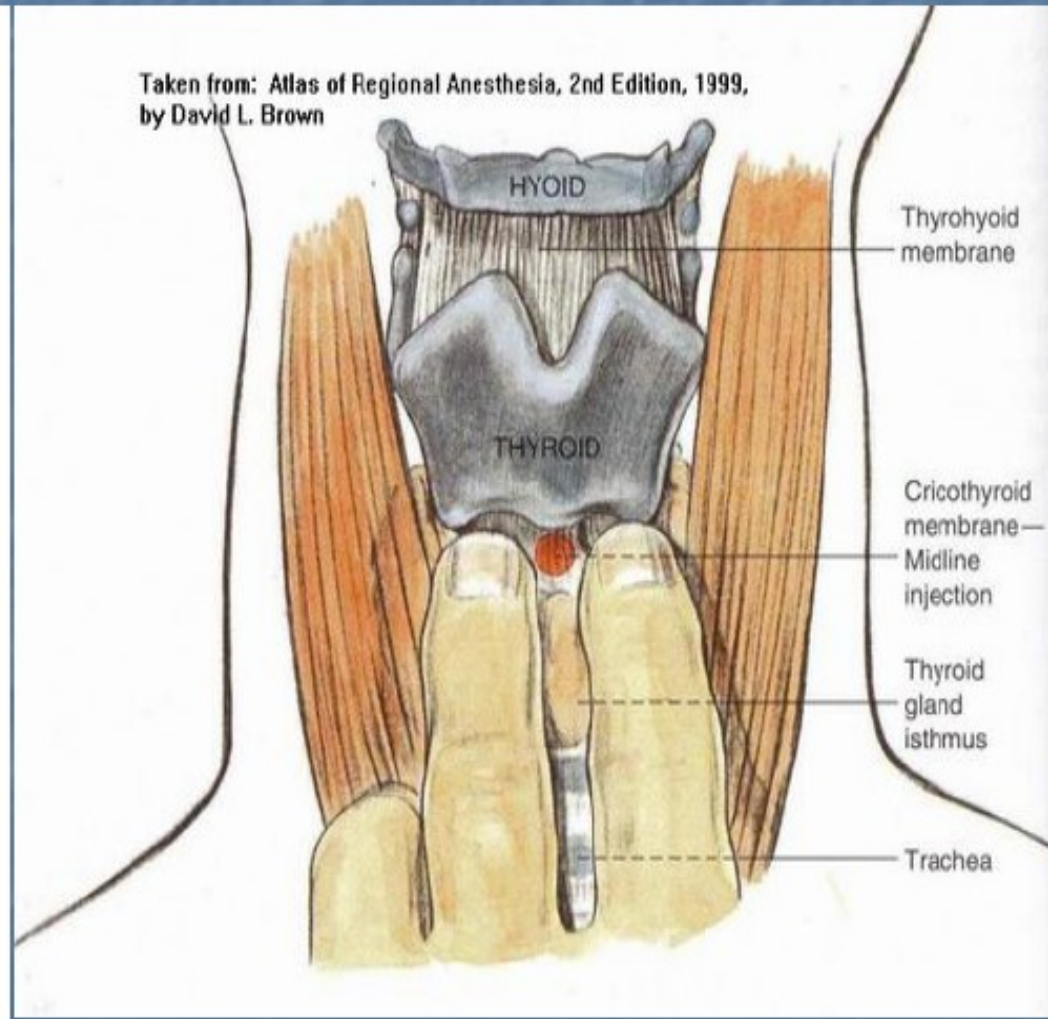
- urgent access to airway
- lig. cricothyroideum (lig)



# Where is the Cric Membrane ?



Taken from: Atlas of Regional Anesthesia, 2nd Edition, 1999,  
by David L. Brown



- Catheter over needle technique was quicker.



- Seldinger technique



# Coniotomy

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



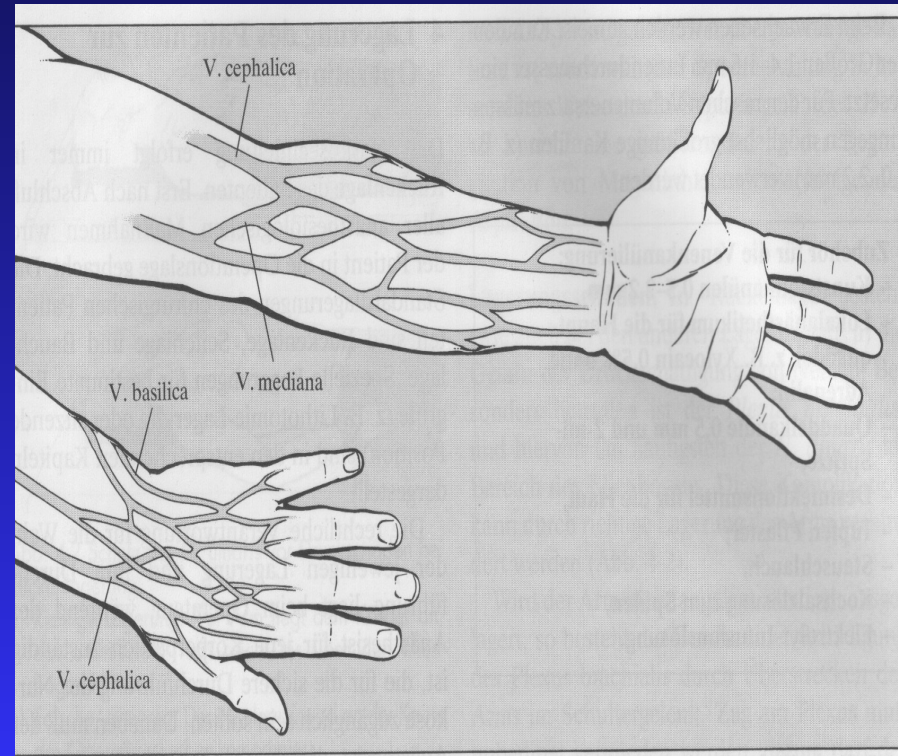
## Peripheral venous access - indication:

- acute drugs
- repeated blood samples
- infusion th (crystalloid, colloid, blood)
- anesthesia

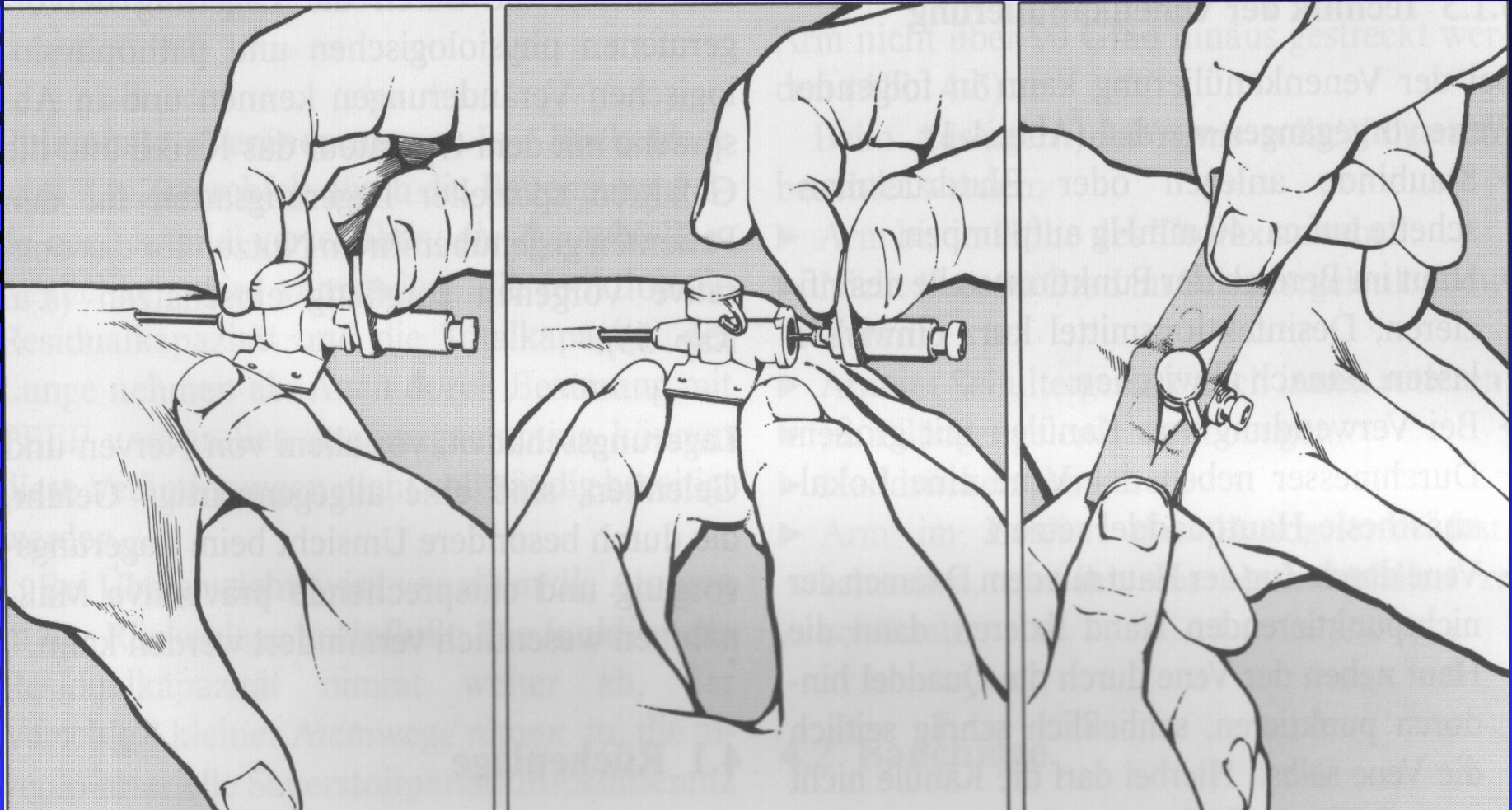


# Peripheral venous access – where

- hand (wide, well filled)
- 2./3 antebrachium
- cubit
- wrist
- v. jugularis externa,  
v. femoralis
- head



# How to



## How to

- place turniket
- disinfection of skin
- fix skin and vein
- punction of vein
- pull out metal needle, pull in flexible part
- displace turniket,
- fixation by plaster
- next attempt proximally

Complication of canylation of peripheral vein:

- puncture a. brachialis, n. medianus
- thrombosis

insufficient blood filling

## Central vein:

I:

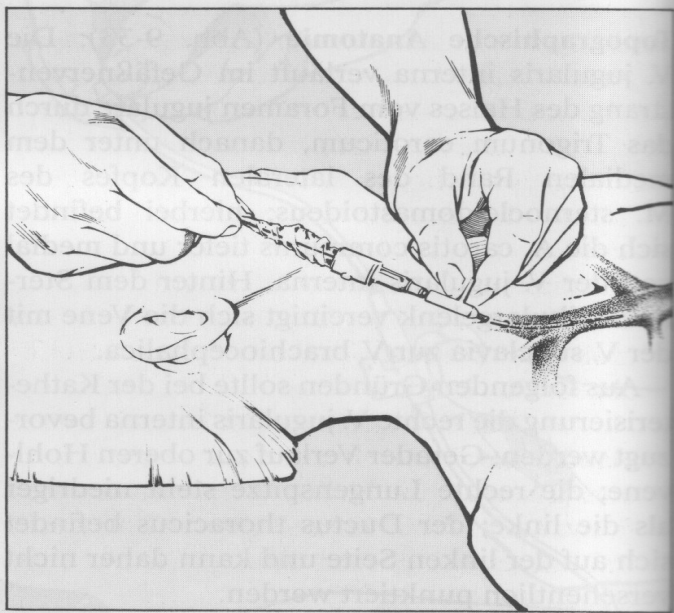
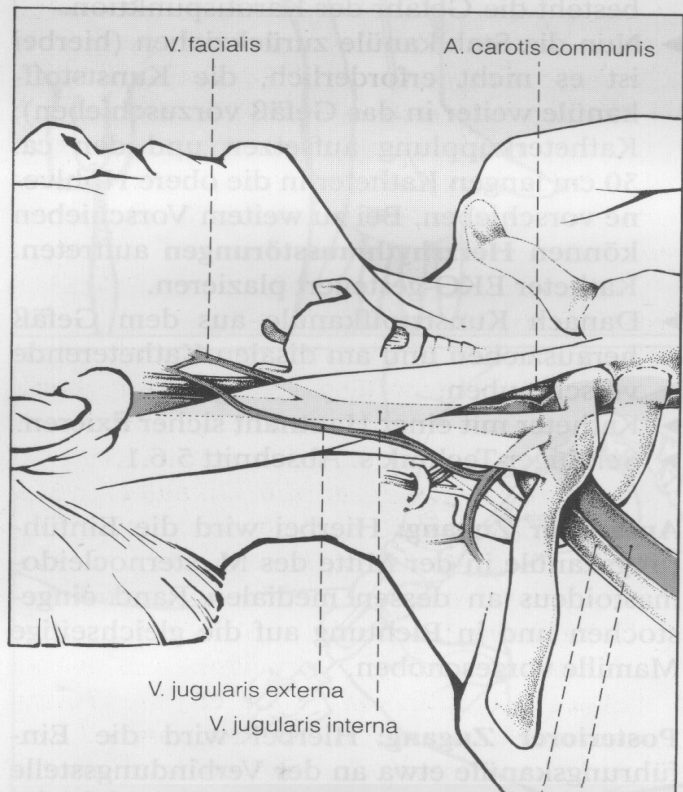
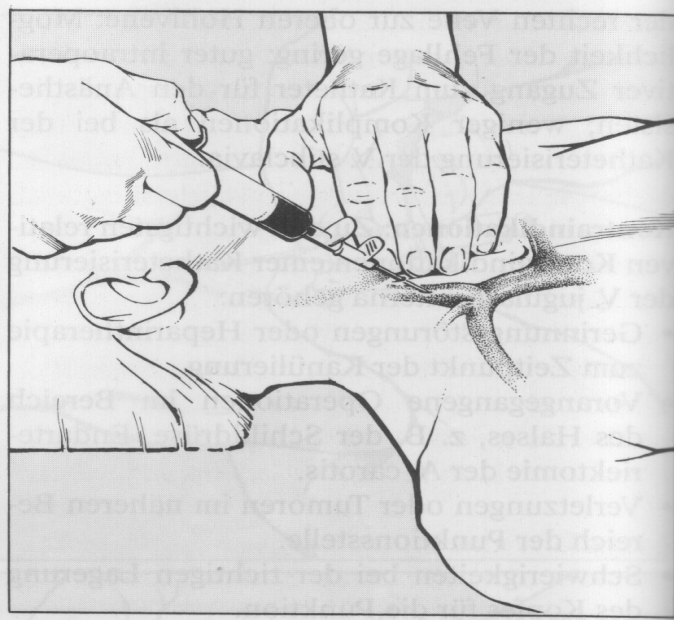
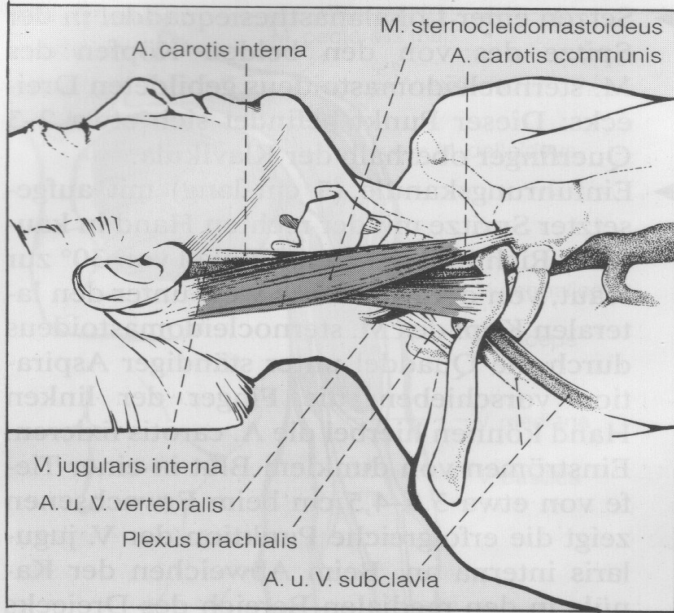
- concentrated fluid, KA, chemotherapy
- CVP
- parenteral nutrition
- continual elimination
- temporary cardiostimulation
  
- unable maintain other vein access

## Contraindications:

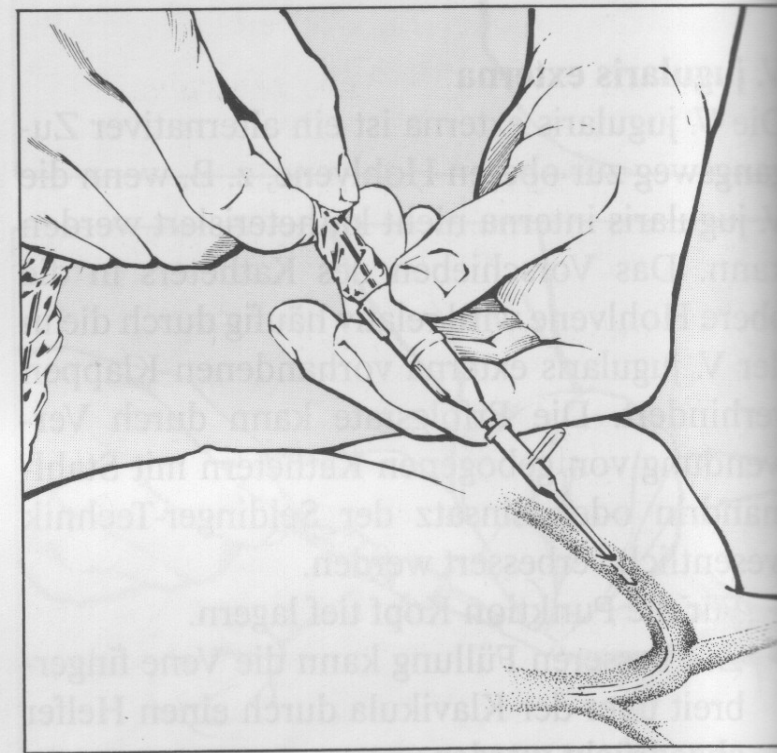
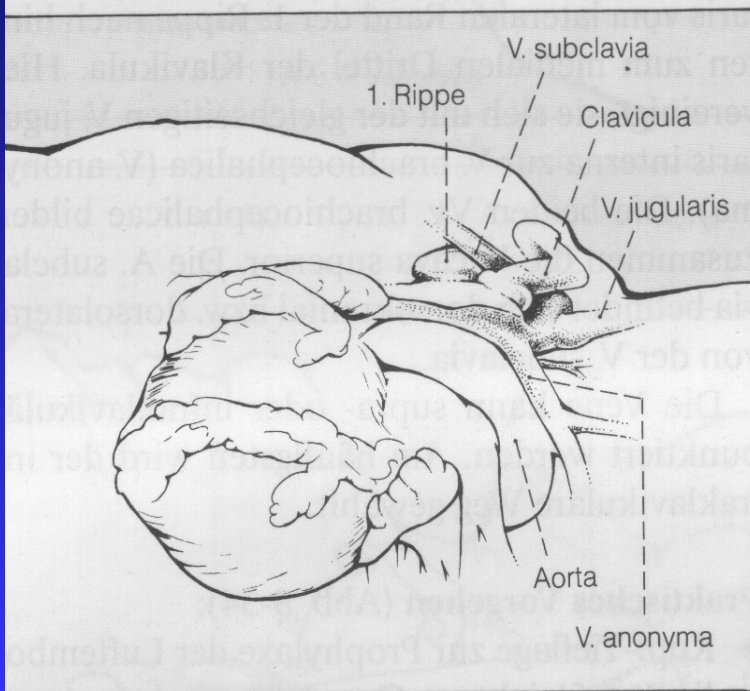
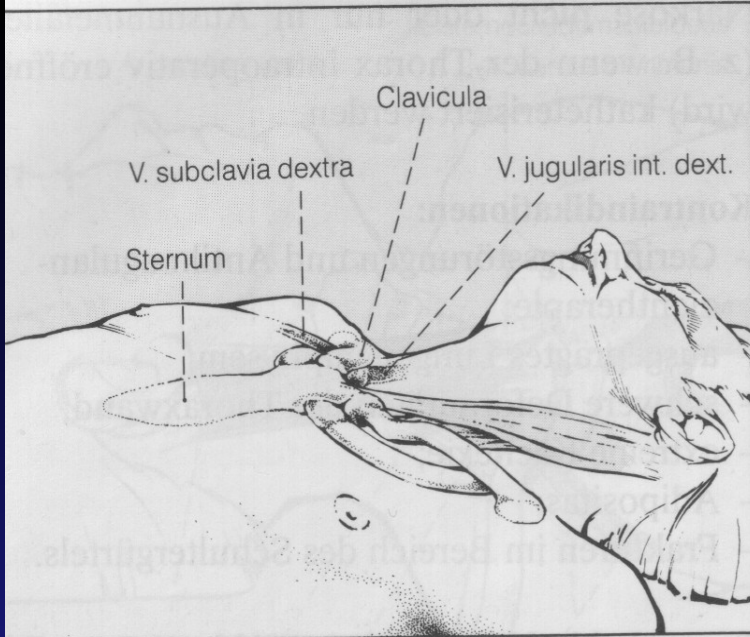
- wrong coagulation
- thrombocytopenia
- tumor nearby
- troubles with placing head

## Where:

- v. jugularis interna
- v. subclavia
- v. femoralis
- v. brachiocephalica







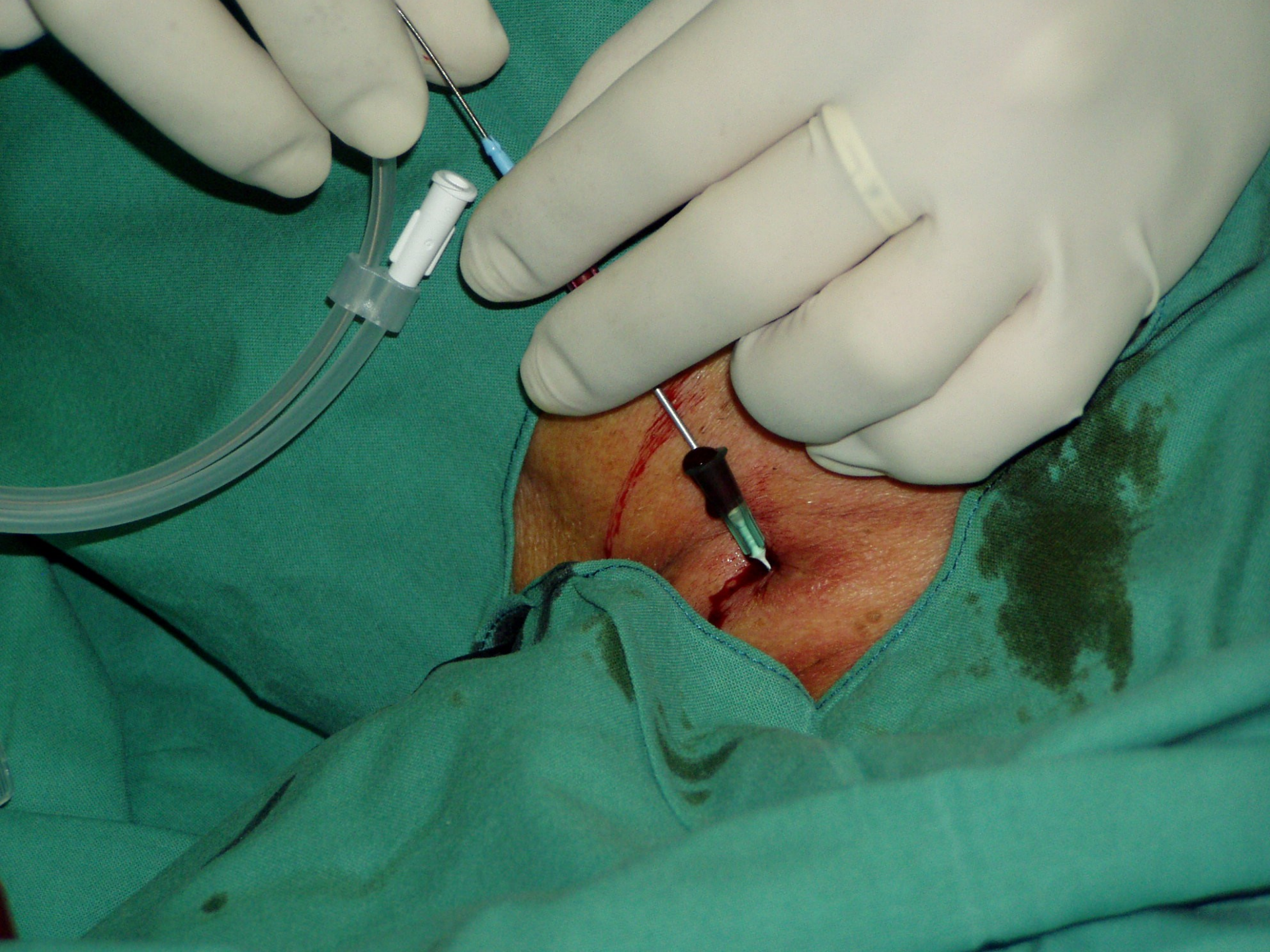
## Aids for cannulation central vein

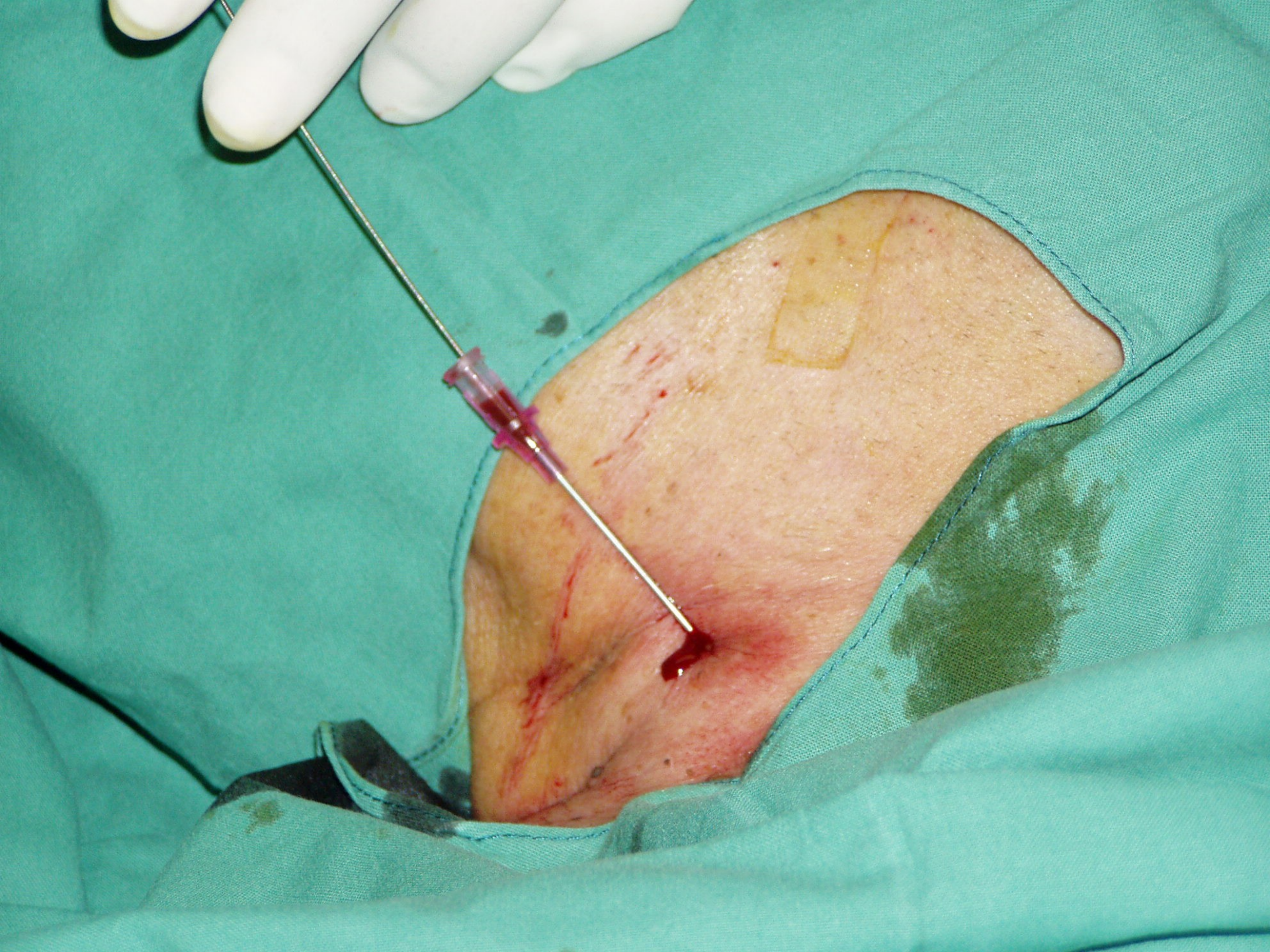
- steril table
- skalpel
- pean
- set
  - catheter-through-needle
  - catheter-over-needle
  - Seldinger techniek







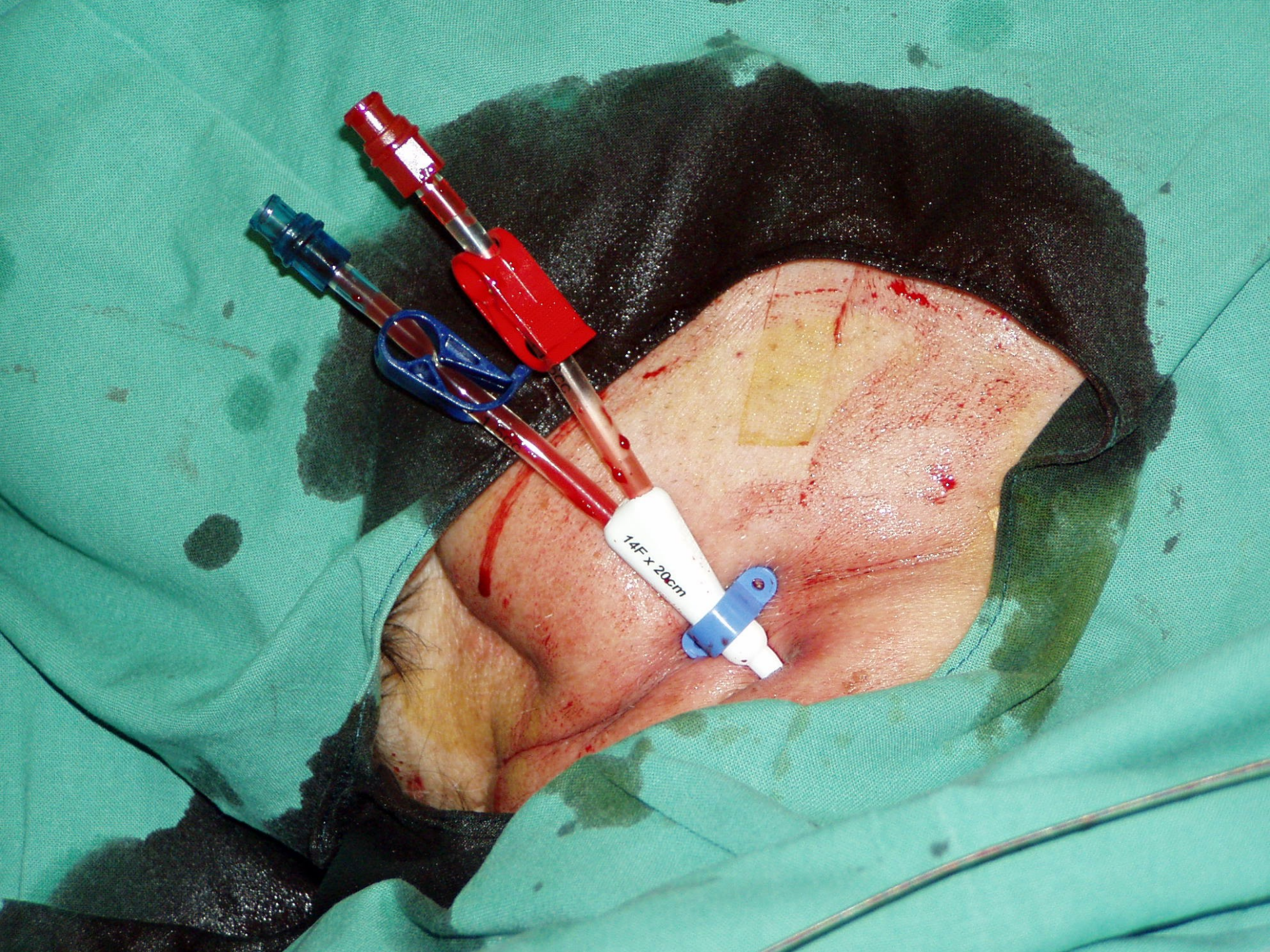


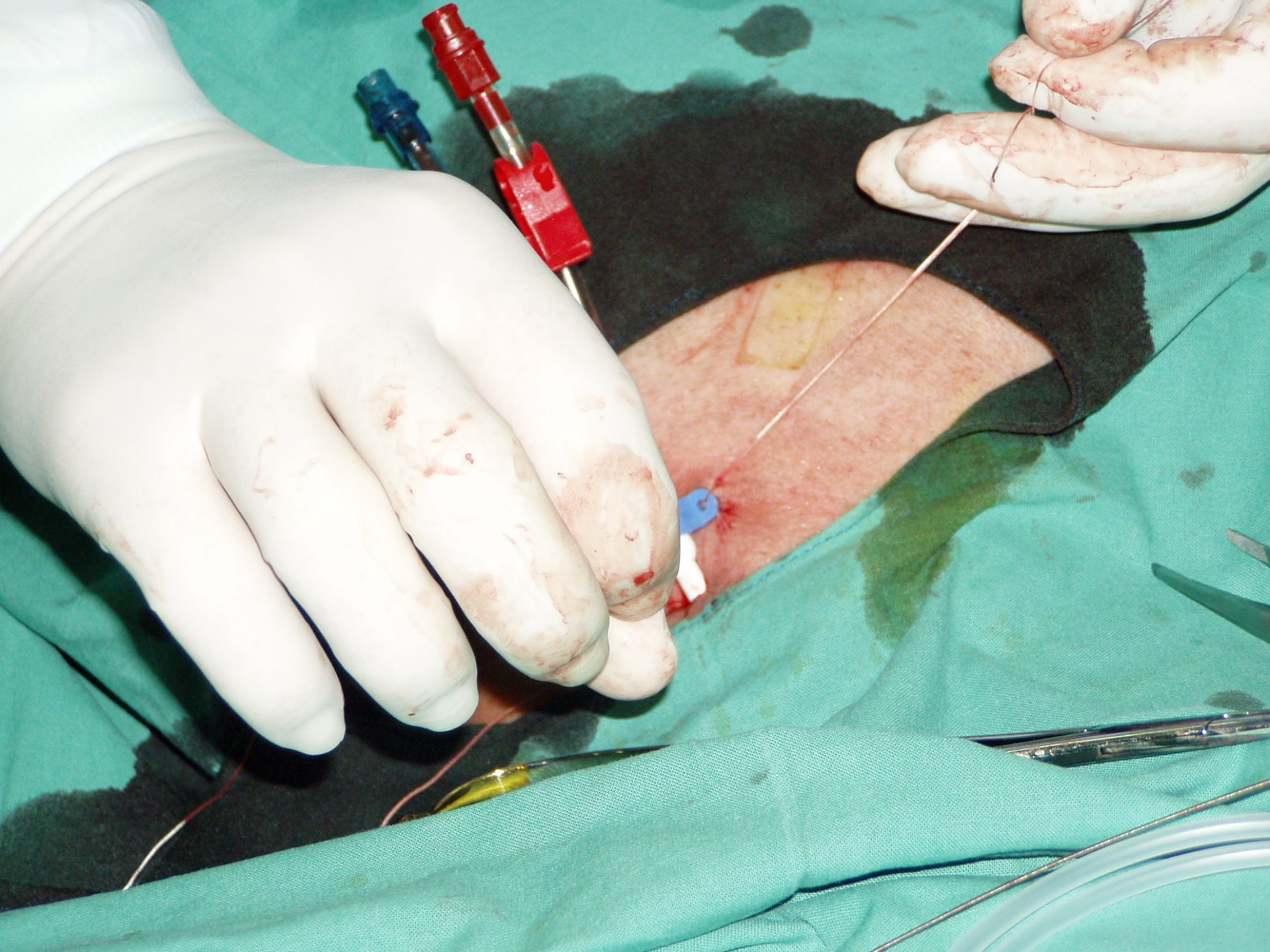












## After canylation

- sterile cover
- control RTG
  - exclude PNO
  - check placing of catheter

## Complications:

- arrhythmias
- PNO
- bleeding
- puncture of arteria
- damage of plexus brachialis
- air emboly
- thrombosis (v.femoralis)
- infection, sepsis









# Alternatives to vein access

- intraosseal access
  - children – tuberositas tibiae
  - adult:
    - maleolus medialis
    - caput humeri
    - distal radius
- intratracheal access – CPR:
  - adrenalin
  - atropine
  - Mesocain (trimecain)