ANESTHESIA FOR ADENO-TONSILLECTOMY

Presented by

Ravie Abdelwahab

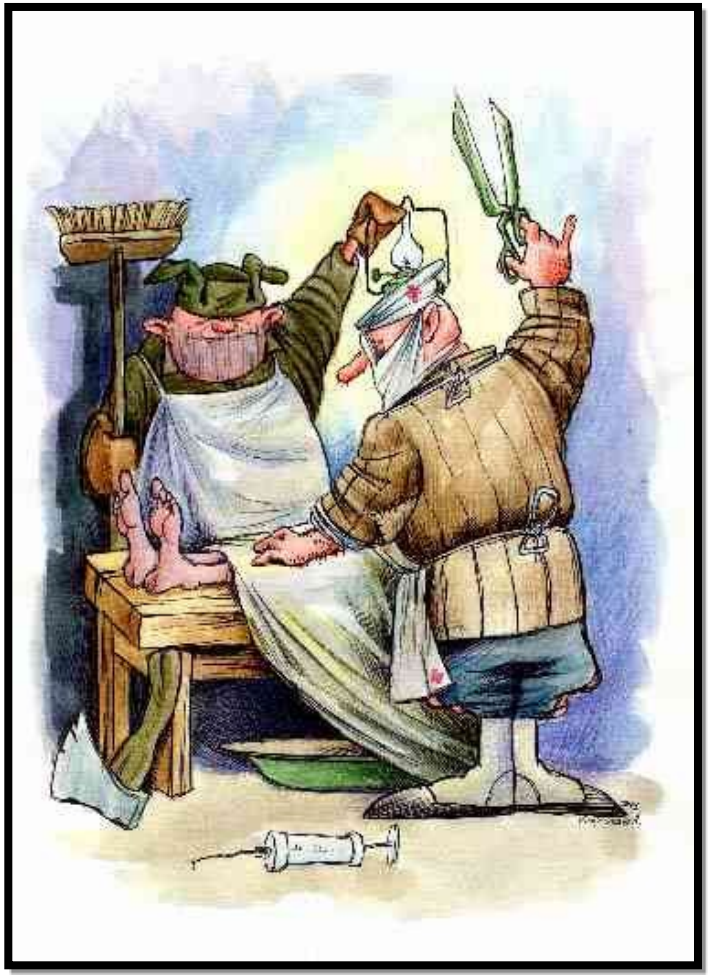
Reviewed by

Dr. Amir Salah M.D.

HISTORICAL REVIEW

- Tonsillectomy is one of the oldest surgical procedures known to man.
- It was first described by Celsus in AD 30 who used a hook to grasp the tonsil then used his finger to incise it. This developed to the common painful guillotine method.
- For a long time the OP was performed without anesthesia however with the availability & better understanding of anesthesia, physicians began to recommend using a GA to perform the tonsillectomy. This also encouraged surgeons to dissect the tonsils out completely.
- Two of the favorite techniques were the single dose method with ethyl-chloride or Nitrous oxide for the guillotine method & ether insufflations of the orophyranx for dissection.

(F. R. H. Wrigley.Can Med Assoc J. 1958)



GA

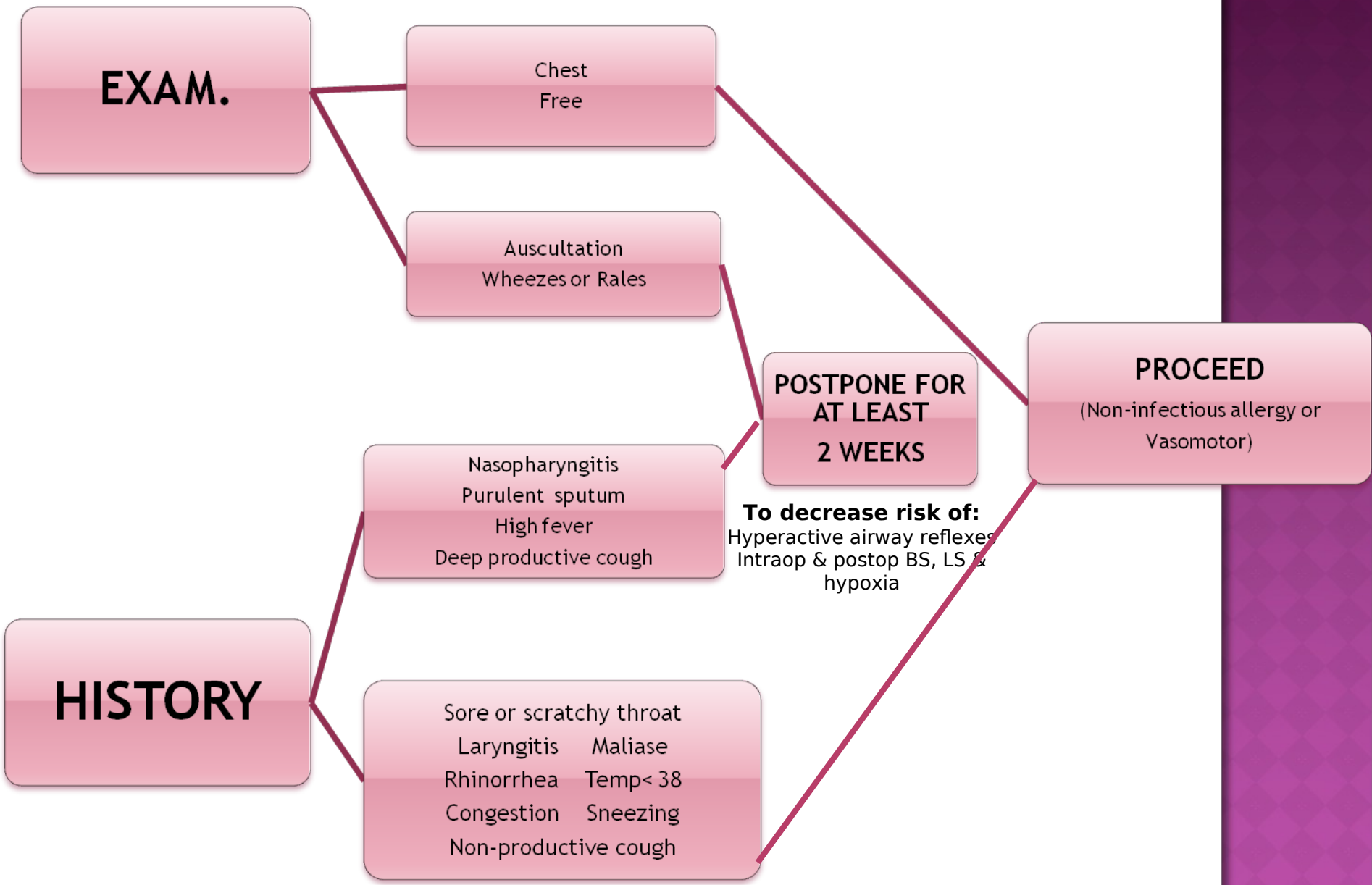


PREOPERATIVE ASSESSMENT

- Routine assessment of any Pediatric patient
  - Usually young & healthy
- With attention to:
  - Presence of RHD (ASOT, Echo….)
  - Presence of OSA
    - Must be differentiated from obstructive breathing & OSA
    - A high index of suspicion is needed to diagnose a child with OSA on clinical suspicion (recurrent episodes of hypoxia, hypercarbia & sleep disruption)
    - Confirm diagnosis by polysomnography, sleep lab tests.
  - URT or LRT infection → *postpone or proceed**
- **CASE 1:** A 3 year old child presents for an elective tonsillectomy his mother reports that for the last 3 days he has had a runny nose & postnasal drip.

  Should you postpone surgery?

RUNNY NOSE + POSTNASAL DRIP



PREMEDICATION

- Preoperative visit to establish doctor patient relationship.
- Sedation (except in OSA)

	Oral	Nasal	IV
Midazolam (mg/kg)	0.5-1.0		0.05-0.1
Fentanyl (ug/kg)			1-3
Morphine (mg/kg)			0.05-0.1
Sufentanil (ug/kg)		0.25-0.5	

- Antibiotic → RHD

INTRAOPERATIVE MANAGEMENT

1. Never forget to first **MONITOR**

2. **INDUCTION**
   - IV or Inhalation or IM or Rectal?

Inhalation

- No IV access
- OSA
- Any other patient

   - CPAP during induction maybe useful for alleviating upper airway obstruction

3. **INTUBATION**

- Following
  - Deep inhalation anesthesia
  - Suxamethonium pre-medicated e’ atropine
  - OSA: awake intubation

- Nasal or Oral (Reinforced ETT / RAE tube)?

NASAL OR ORAL?

- Nasal intubation
  - Disadvantages
    - Epistaxis
    - Adenoid injury
    - Naso-pharyngeal tear
    - Liable to obstruction
    - Infection
    - Aspiration
    - Needs muscle relaxation
  - Advantages
    - Wider surgical field therefore preferred by some surgeons

REINFORCED ETT

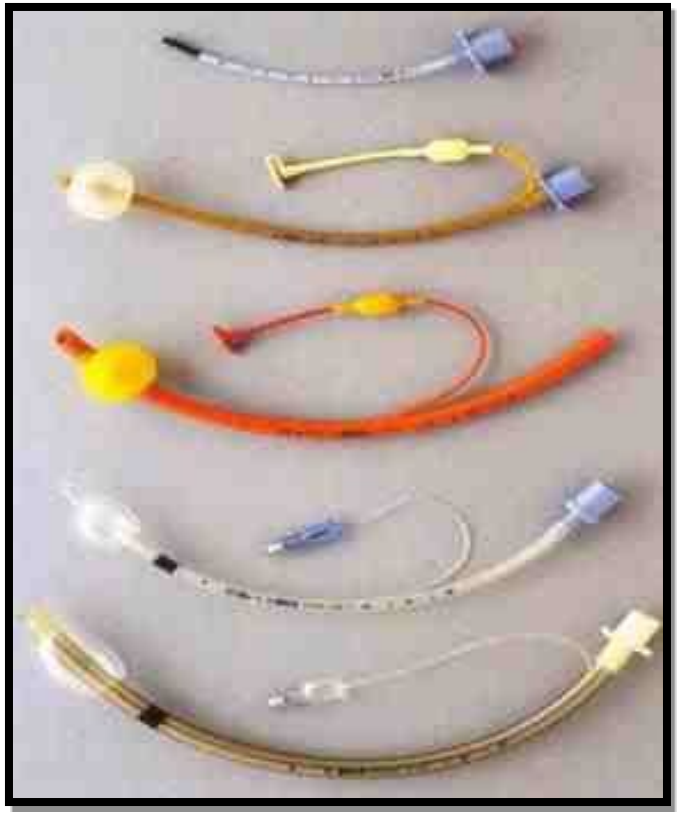


RAE TUBE



Optimize visualization of the surgical field

REINFORCED LMA OR ETT?





REINFORCED LMA

- Airway tube may be positioned away from surgical field without loss of seal
- Wire-reinforced tube resists kinking and cuff dislodgment
- Available in pediatric and adult sizes



RCT COMPARING REINFORCED LMA & ETT

	LMA (55)	ETT (54)
Sp O2 during insertion <94%	10 pt	7 pt
Airway obs after opening mouth gag	10pt	3pt
Manual airway ventilation	26pt	All
End-Tidal Co2	46.6mmHg	45.5mmHg
Heart Rate (bpm) MAP Bloob loss (ml/kg-1)	110 74 1.92	143 85 2.62
Fiberoptic laryngoscopy at end	No blood in larynx	Blood in larynx

Can J Anaesth. 1993 Dec;40(12):1171-7.

RCT COMPARING REINFORCED LMA & ETT

100 pts / age 10-35 / ASA 1

	LMA (50)	ETT (50)
Surgical access	48	49
Cough/ Laryngospasm Stridor	Low frequency	High frequency
Hemodynamic changes (at 1-5 min post induction)	Non-significant change from baseline	Significant change from baseline

Conclusion

Armored LMA is more reliable due to :

- Adequate surgical access
- Lower occurrence of BS, LS on recovery
- Fewer hemodynamic changes

J Coll Physicians Surg Pak. 2006 Nov;16(11):685-8

4. EXTUBATION

- Tracheal extubation when pt:
  - Awake *(if asthmatic while pt still anesthetized to BS & LS)*
  - Lateral , head down position
  - Following pharyngeal suction

POSTOPERATIVE CARE

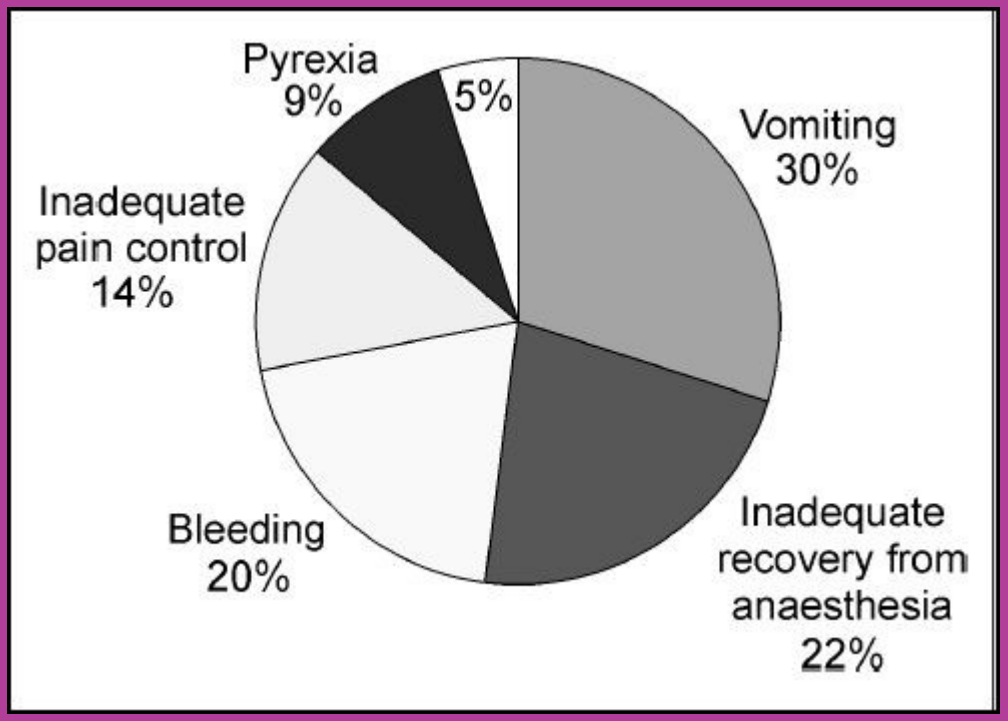
- Position: prone with head turned to one side (Post-tonsillectomy position) for
  - Drainage of residual oozing
  - Early detection of postoperative bleeding

- Analgesia management(imp due to diathermy induced pain)
  - Opioids
    - Mainstay of postop analgesia
    - Increase incidence of postop emesis & respiratory morbidity

  - Opioid-sparing adjuncts
    - Dexamethasone (single intraoperative dose 0.5-1mg/kg→ reduce post-tonsillectomy pain & edema)
    - Acetaminophen (rectal paracetamol)
    - NSAIDS (great controversy / bleeding vs pain)

- ICU (in OSA cases) for close observation
- Observe for occurrence of any postoperative complications.
- Discharge policy
  - Children < 3years or with medical disorders (e.g.OSA) are not candidates for out-patient tonsillectomy
  - All others are day cases.

POSTOPERATIVE COMPLICATIONS



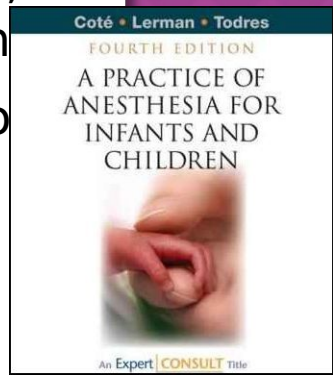
Ann R Coll Surg Engl 2008; ***90: 226–230***

1. BLEEDING

- Not most common BUT most serious and most challenging for the anesthesiologist

- It requires often dealing with
  - Parents: Anxious
  - Surgeon: Upset
  - Child:
    - Frightened
    - With a stomach full of blood
    - Anemic
    - Hypo-volemic

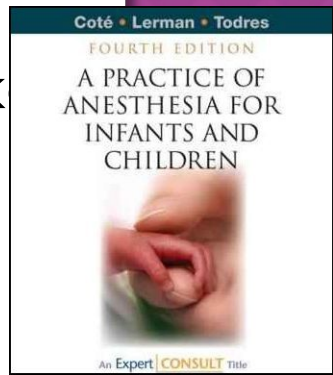
- Role of anesthesia
  - Review of record of original surgery (Difficult airway, medical disease & intraop blood loss and fluid replacemen
  - Ask about (Duration of bleeding attack & amount of bloo vomitied)
  - Quick history & examination (childs volume status, s/s of hypotension)

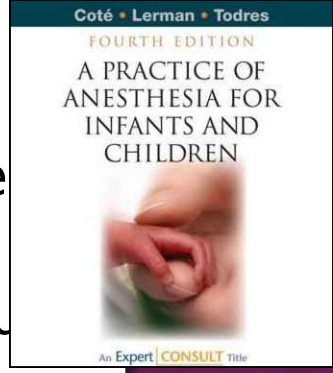


N.B.

- The presence of orthostatic hypotension indicates > 20% loss of circulatory volume → aggressive resuscitation → blood transfusion.
- **!!!!!!!** The onset of hypotension maybe delayed or even absent in an awake patient as a result of CA induced VC → with anesthesia induced VD → PRFOUND HYPOTENSION.

  - Before Induction
    - Vigorous resuscitation to ↑ COP
      - Crystalloids (repeated bolus 20mg/kg)
      - Colloids
    - Hct , Hb & coagulation profile
    - Cross-matching & preparation of 2 units of pack RBCs





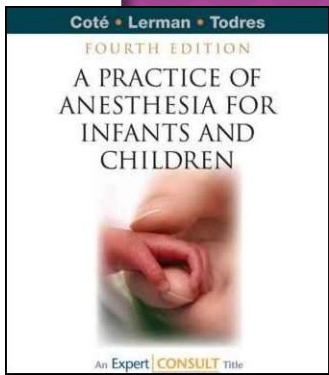
- Induction
  - Make available ; a styletted ETT/ 2 sets of illuminate laryngoscopes/ 2 large bore rigid suction
  - Left lateral position with head down to drain blood ou of mouth.
  - Place in supine position & Rapid sequence crash induction + cricoid pressure after good oxygenation
  - A reduced doses of these induction agents thiopental (2-3mg/kg) , Propofol (1-2mgkg), Ketamine (1-2mgkg) followed by Atropine (0.02mg/kg) combined e' sux (1-2mgkg) for tracheal intubation allow rapid control of airway without hypotension.

N.B.

- There is no evidence that cricoid pressure risk of aspiration, although it is common practice.
- Note that aspiration of blood does not have a similar effect as acid aspiration unless the amount of blood aspirated compromises oxgyenation.

- Maintenance
  - Titration of a volatile anesthetic such as sevoflurane or desflurane e’ nitrous oxide & O2 supplemented e’fentanyl (1-2ug/kg)
  - Suction of the stomach under vision + prophylactic antiemetic (Ondansetron 0.1mg/kg)

- Extubation: FULLY AWAKE in the lateral position



2. VOMITING

- Vomiting is the commonest cause of morbidity; re-admission after day-case tonsillectomy & accounts for 30% of re-admissions.
- **Reasons for the high rate of vomiting after tonsillectomy**
  - Surgical factors
    - Trigeminal nerve stimulation
    - Diathermy
    - Swallowed blood
  - Anaesthetic factors
    - Opiates
    - Steroids
    - Anti-emetics
    - Inhalational anaesthesia
    - Laryngeal mask airway
  - Patient factors : Age & Sex

- **Anesthesia factors**
  - Opiates: + CRT zone → Vomiting center
  - Steriods:
    - Single, IV, intra-op dose of dexamethasone (0.15–1mg/kg halves the risk of vomiting.
    - Mechanism of action: Unknown
  - Antiemetics
    - Prophylactic ondansetron works better than either droperidol or metaclopramide in reducing PONV
    - Anti-emetics work best in combination because of their different mechanisms of action.
  - Inhalational anesthetics
    - About 25% of patients suffer from PONV after volatile anaesthetics.
    - When total IV anaesthetic with Propofol is substituted for the volatile anaesthetic, the risk of vomiting is reduced by 20%.

- LMA
  - NO agreement in the literature on whether LMA reduces vomiting or not
  - theoretically, it should be **LESS** as
    - no muscle relaxant reversal is required
    - less swallowed blood.

- **Age factor**
  - Peak in late childhood (between 6–16 years) before decreasing in adulthood

- **Sex factor**
  - Postoperative vomiting is 2–3 times more common in adult females than adult males

A significant reduction in paediatric post tonsillectomy vomiting
Ann R Coll Surg Engl 2008; 90: 226–230

FUTURE PROSPECTS



The only difficult airway device that allows ventilation, visualization and intubation

The LMA CTrach™ is designed to increase intubation success rates in difficult airways. The LMA CTrach™ mask enables ventilation during intubation attempts while built-in fiberoptics provide a direct view of the larynx and real time visualization of the ET tube passing through the voca cords.

The LMA CTrach™ can be inserted exactly the same as the LMA Fastrach™. However, unlike the LMA Fastrach™, once the airway is secured and patient is being ventilated, the viewer is switched on, placed in the magnetic connector and a clear image of the larynx is displayed in real time. The ET tube can be viewed as it enters the trachea. Once the patient is intubated, the viewer is removed and the mask is removed leaving the ET tube in place.

THANK YOU FOR YOUR ATTENTION

