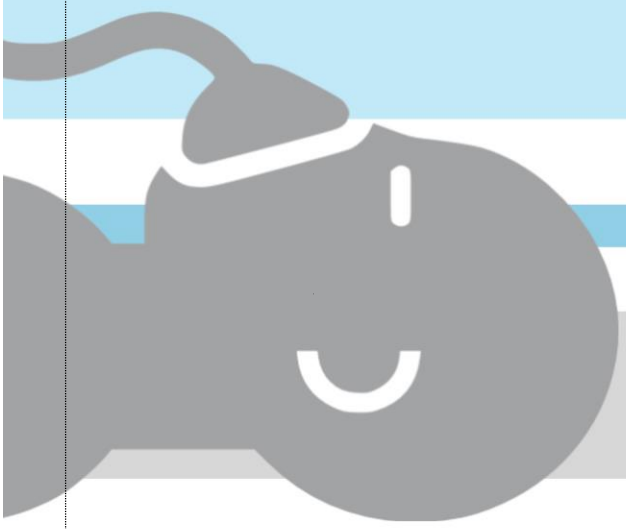


ANESTHESIA

(3) General Anesthesia Technique

Leader: Mody A. AlMarshad

Done by: Lulu AlObaid & Rahaf Salem

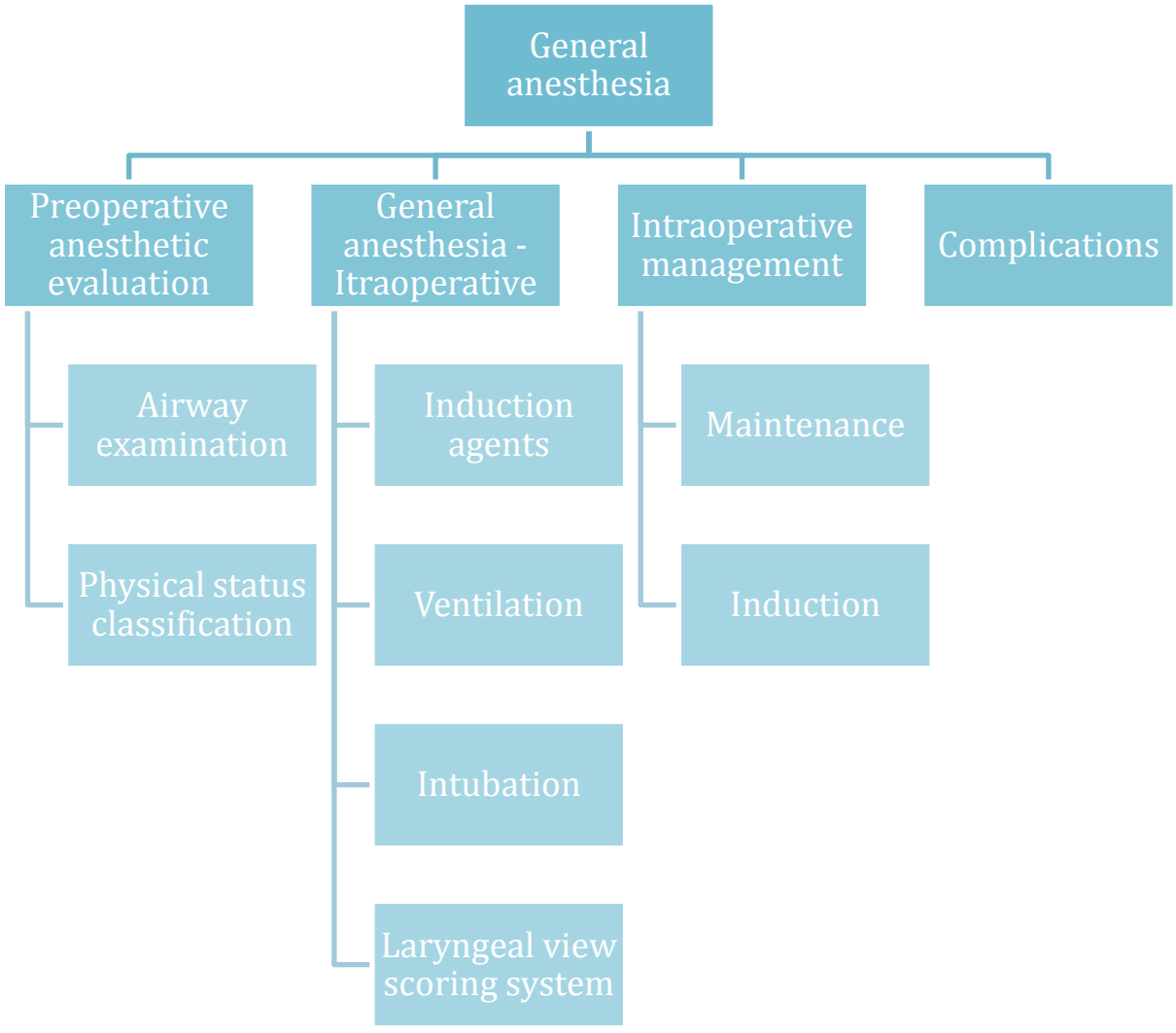
Revised by: Mody A. AlMarshad

Doctor's note Team's note Not important Important 431 teamwork

(431 teamwork do not highlight it in yellow, but put it in a yellow "box")

Objectives:

1. Define general Anesthesia.
2. Learn about several agents used for induction of general anesthesia including intravenous agents, inhalation agents, neuromuscular blocking agents and reversal agents.
3. Understand basic advantages and disadvantages of these agents.
4. Complications commonly encountered during general anesthesia.



Role of Anesthetists

- ✓ **Preoperative evaluation and patient preparation** (**Example:** if a patient is going to do a surgery, we don't just admit him/her directly. Preoperative assessment must be done. We check if the patient has uncontrolled comorbidities which need to be optimized and refer them accordingly to make their condition as optimal as possible for surgery)
- ✓ **Intraoperative management**

  - General anesthesia:
    1. Inhalation anesthesia
    2. Total IV anesthesia

  - Regional anesthesia & pain management:
    1. Spinal, epidural & caudal blocks
    2. Peripheral never blocks
    3. Pain management (acute and chronic pain)

- ✓ **Post anesthesia care unit (PACU management)**
- ✓ **Anesthesia complication & management**

General Anesthesia

History of Anesthesia: General anesthetics have been used since 1846 when Morton demonstrated the first anesthetic (using ether) in Boston, USA. Local anesthetics arrived later, the first being scientifically described in1884.

General anesthesia is described as a reversible state of unconsciousness with inability to respond to a standardized surgical stimulus. (This basic definition has been used for years)

In modern anesthetic practice, this involves the triad of: **unconsciousness**, **analgesia** (Pain free), **and muscle relaxation**.

- The primary goal is the maintenance of physiologic homeostasis. This includes monitoring and treatment of cardiovascular, pulmonary, neurological and renal functions and changes during perioperative period to minimize adverse outcomes. Optimizing intraoperative physiology may help **speed recovery** & **perioperative organ system protection**.

General anesthesia

All this planning must be done before taking the patient to the Operative room

- ✓ **Assessment** (History, examination & comorbidities)
- ✓ **Planning I:** Monitors
- ✓ **Planning II:** Drugs
- ✓ **Planning III:** Fluids
- ✓ **Planning IV:** Airway Management (LMA (laryngeal mask airway), Endotracheal tube or sedation)
- ✓ Induction: putting the patient to sleep
- ✓ Maintenance: keeping the Patient asleep & hemodynamically stable during the surgery
- ✓ Emergence: waking the patient up after the surgery
- ✓ Postoperative care **Example:** regular postoperative care unit, HTU or ICU

Objectives of Anesthesia

- Unconsciousness
- Amnesia (the patient should not remember anything during the surgery)
- Analgesia
- Oxygenation
- Ventilation
- Hemostasis
- Airway Management
- Reflex Management
- Muscle Relaxation
- Monitoring

Preoperative anesthetic evaluation

1. **Risks of Anesthesia:**

It's important to identify if the patient is at risk of developing intraoperative/ postoperative complications or if the patient is bound to be referred to the ICU after surgery.

2. **Physical status classification (Important!)** "ASA = American society of anesthesiologists "

- **Class I:** A normal healthy patient.
- **Class II:** A patient with mild systemic disease. e.g. asthma and don't frequently visit the hospital or patient has asthma+ thalassemia minor+ BP and all of them are controlled. **(No functional limitation)**
- **Class III:** A patient with severe systemic disease e.g. an obese patient with COPD and feels dyspneic after climbing the stairs. Uncontrolled DM or BP or Asthma. Morbid obesity. **(Some functional limitation)**

Patients with drug allergies are categorized in this Class ←

- **Class IV:** A patient with severe systemic disease that is a constant threat to life e.g. Unstable Angina **(functionality incapacitated)**.
- **Class V:** A moribund patient who is not expected to survive with or without the operation they may or may not survive within 24 hours impending ruptured aortic aneurysm with multiple comorbidities. At that time you have to decide whether the surgery is really needed
- **Class VI:** A brain-dead patient whose organs are being removed for donor purposes
- **Class E:** Emergent procedure added after the ASA class if it is an emergency

Example: if a patient with ASA II with controlled bronchial asthma that came with acute appendicitis (emergency) = **ASAII E**

Or a patient with *uncontrolled* diabetes and comorbidities presented with perianal bleeding (needs urgent intervention) = **ASA III E**

3. **Airway examination - Mallampati classification (Important!)**

The patient must be seated in an upright position and you should align your eyes with the level of patient's mouth, and ask the patient to protrude their tongue **"without making any sounds"**

This predicts about 50% of difficult intubations

Class I: Uvula, tonsillar pillars, soft and hard palate visible (4 structures are visible)

Class II: Tonsillar pillars, soft and hard palate visible (3 structures)

Class III: Soft and hard palate visible (2 structures)

Class IV: Hard palate visible. (1 structure)

Patients in Grades 3 and 4 are considered difficult to intubate and those in **Grades 1 and 2** are considered feasible intubations. It is important to realize that this system is *not* infallible and patients in Grade 2 sometimes cannot be intubated.

4. **NPO status**

All patients undergoing any kind of anesthesia should be NPO

- **NPO**, Nil Per Os, means nothing by mouth
- **Solid food**: 8 hrs before induction
- **Liquid**: 4 hrs before induction
- **Clear water**: 2 hrs before induction
- **Pediatrics**: stop breast milk feeding 4 hrs before induction (formula milk should be stopped 6-8 hours before because it is thicker than the mother's milk)

Considered as full stomach(cricoid pressure):
-Patients in emergency. E.g. Trauma patients.
- Pregnant in 3rd trimester.
- Morbid obese patients.
- Diabetic patients
Even if they are NPO due to delayed gastric emptying.

5. **Anaesthetic plan:**

- ✓ **Premeds:**
  Example: if the patient is anxious. E.g. Breast CA patient (anxiolytics). Patients with bronchial asthma (Ventolin nebulization 30 minutes before the procedure) History of regurgitation (Ranitidine & antiemetic agents).

- ✓ **Intraoperative management**:

General:

1. Airway management
2. Induction
3. Maintenance
4. Muscle relaxation

Monitoring:

1. Positioning (avoid nerve damage according to the patient's position)
2. Fluid management
3. Special technique (Regional block along with GA for pain relief , epidural or central line)

- ✓ **Postoperative management** Pain Control:

1. PONV (postop. Nausea and vomiting). Ear surgery patients or patients with hx of PONV they are more prone to have PONV.
2. Complications anything that can occur in the recovery room e.g.: Hypotension, lung collapse
3. Post-operative ventilation whether you should extubate the patient or kept on mechanical ventilation and shifted to the SICU.
4. Hemodynamic monitoring

General Anesthesia- Intraoperative

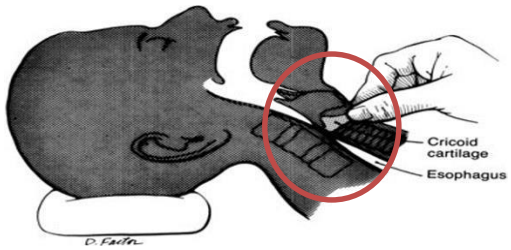
1. Monitor
2. Pre-oxygenation (Important!): Before induction the patient must breathe 100% oxygen for at least 3 minutes from a suitable breathing circuit. This will help increase the time apnea period (the pause where the patient stops breathing after administering the medication and intubating). There is now a greater reservoir of oxygen in the lungs to utilize before hypoxia occurs.
3. Induction: in children: if there is no IV cannula → inhalation induction is used (sevoflurane)

   In adults or if there is an IV line → induction is by IV anesthetics.

   Including RSI (Rapid sequence induction): **Used in emergencies** or with patients who are considered as "full stomach" by applying cricoid pressure + administering medication and pre-oxygenation all at once without bagging to immediately intubate within (30-60 seconds)

   Cricoid pressure: The cricoid cartilage is the only ring shaped cartilage. When compressing the cricoid by applying pressure, it will result in closing the esophagus, which will prevent any regurge and aspiration of the food contents.

Example: If a pregnant patient is scheduled for an elective cesarean section, a cricoid pressure will be applied. Because of the distended abdomen they have the tendency to regurge.



Normal induction & intubation: pre oxygenation → IV Propofol + Fentanyl → ask if the patient is breathing then ventilate the patient by bagging and add on the muscle relaxant to paralyze the muscles→ you should keep on ventilating for 3 minutes till the muscle relaxant starts affecting → intubate the patient .

4. Mask ventilation
5. Muscle relaxants
6. Intubation & ETT position confirmation

How to confirm that the endotracheal tube is in the right place?

A. Visualizing the tube through vocal cords. The best clinical method of confirming tracheal intubation.

B. Chest movements after connecting the tube to the circuit.

C. 5 point auscultation: by auscultating the apices, bases of the lungs and the stomach to make sure that the endotracheal tube wasn't inserted through the esophagus (starting with the stomach first)

End Tidal CO2 = 5% (No CO2 is excreted from the stomach, so any CO2 present must be from the lungs Six breaths of CO2 must be seen to confirm tracheal intubation.

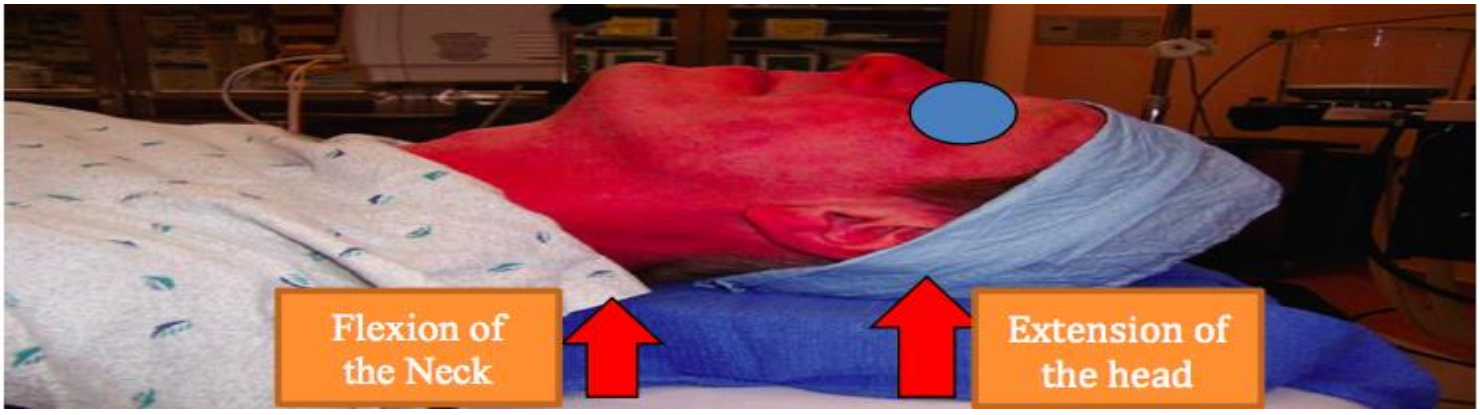
* Although there are many tests to confirm tracheal intubation, the 'gold standard' is six breaths of end-tidal CO2 with visual confirmation of laryngeal placement of the tube.

7. Maintenance

8. Emergence

Sniffing position (Golden Position)

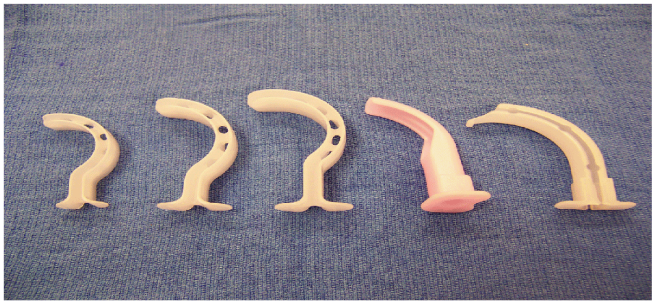
Placing a pillow under the patient's head. Flexion of the neck & Extension of the head at the cervical spine (as if the person is taking a deep breath on a good day) this position will make it easier for doctors to visualize the airway and will become in line

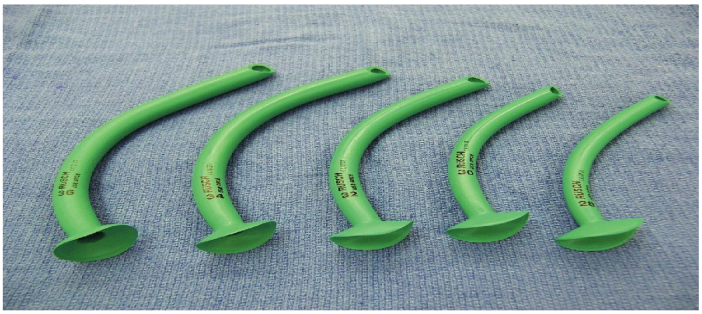


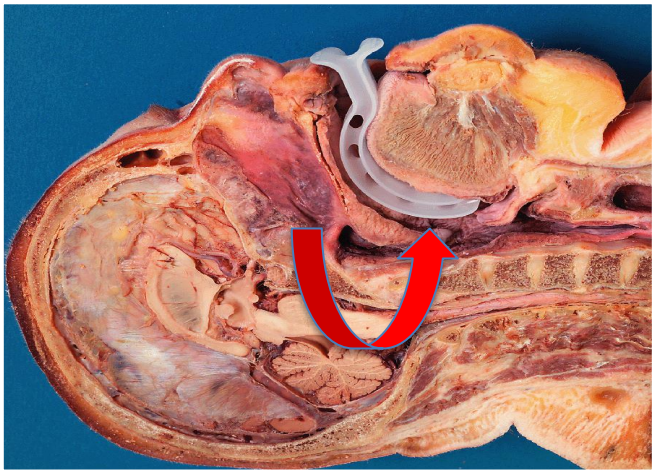
Mask and airway tools

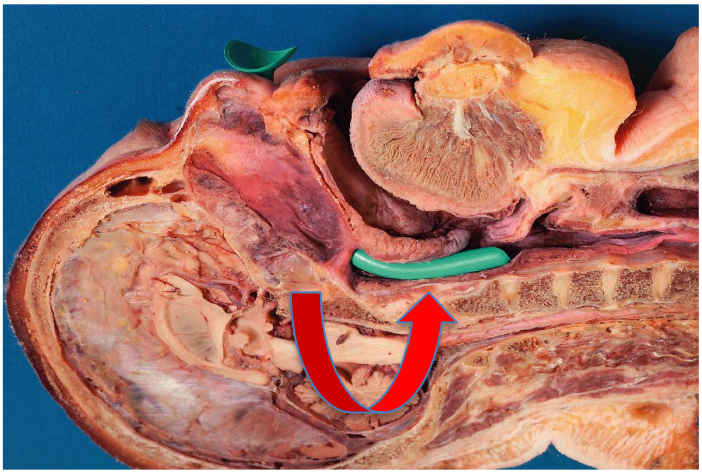
Function: to make the airway patent.

Mask airway









Oropharyngeal airways: is used in unconscious patients to avoid tongue swallowing.

Size Measuring: from the angle of the mouth to the angle of the jaw.

Nasopharyngeal airway: used in partially conscious patients with intact gag reflexes that will not tolerate oropharyngeal airways. Or Maxillofacial procedure patient b/c the jaw is wired, when you want to extubate him put nasopharyngeal airway to support the tongue or in locked jaw.
Size measuring: from the nostril to the tragus of the ear.

Mask ventilation

2 Techniques

1. **Single handed**: by making a C shape with the thumb and index on the mask and E shape on the jaw with the remaining 3 fingers

2. **Double handed**: Using both hands, place the thumb on the mask by pushing and lifting the jaw forward to open the airway. If your hands are small or for obese patients

Difficult BMV (Bag Mask Ventilation)- MOANS

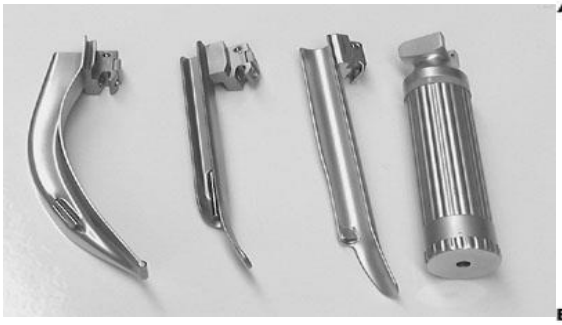
- **MASK SEAL:** mask seal requires normal anatomy, absence of facial hair, lack of interfering substances like vomitus or bleeding & ability of apply mask with pressure.
- **OBSTRUCTION/ OBESITY:** Obstruction of upper airway, obesity (BMI greater than 26) is an independent marker. Redundant upper airway tissue, chest wall weight & resistance from abdominal contents impede airflow.
- **AGE:** General loss of elasticity & increased incidence of restrictive /obstructive lung disease with increasing age.
- **NO TEETH:** Edentulous creates difficulty. (Fixed artificial dentures no need to remove them but removable ones we ask the patient to remove them)
- **STIFFNESS:** Resistance to ventilation with COPD, Asthma, Pulmonary edema.

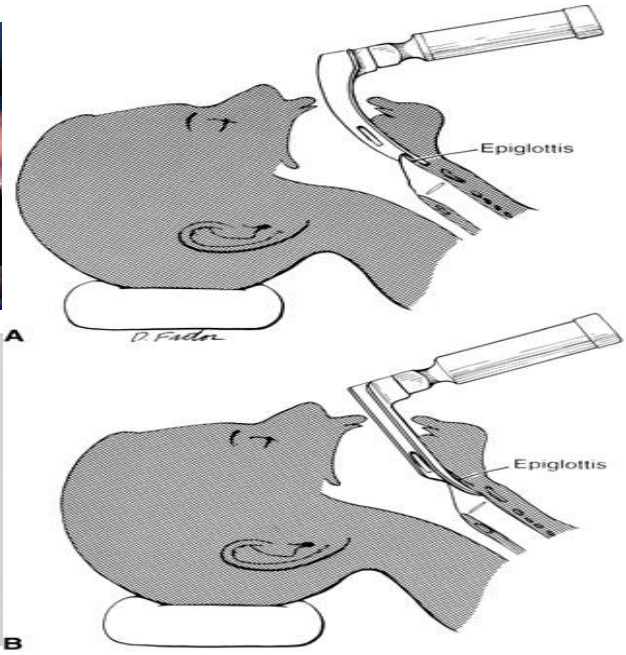
Intubation

Intubation is done in 2 ways:

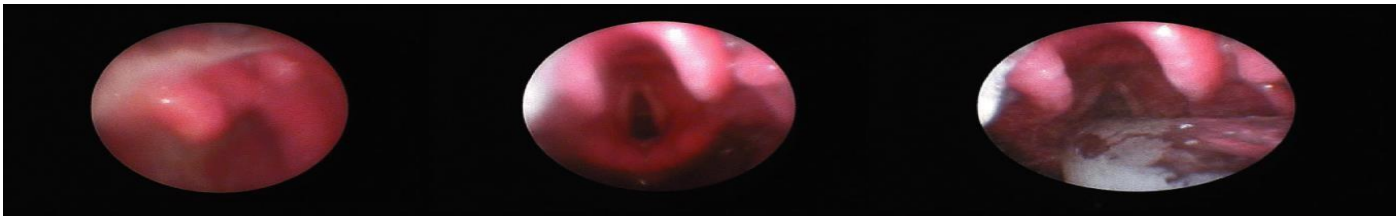
1. *Regular laryngoscope*: by Holding the Laryngoscope with the left hand go from the right side of the mouth with the laryngoscope blade pushing the tongue to the left side → going deeper, the epiglottis will be visualized at the back of the tongue. At this point lift your handle and up you will see the glottic opening and you will be able to intubate

2. *Glidescope*.



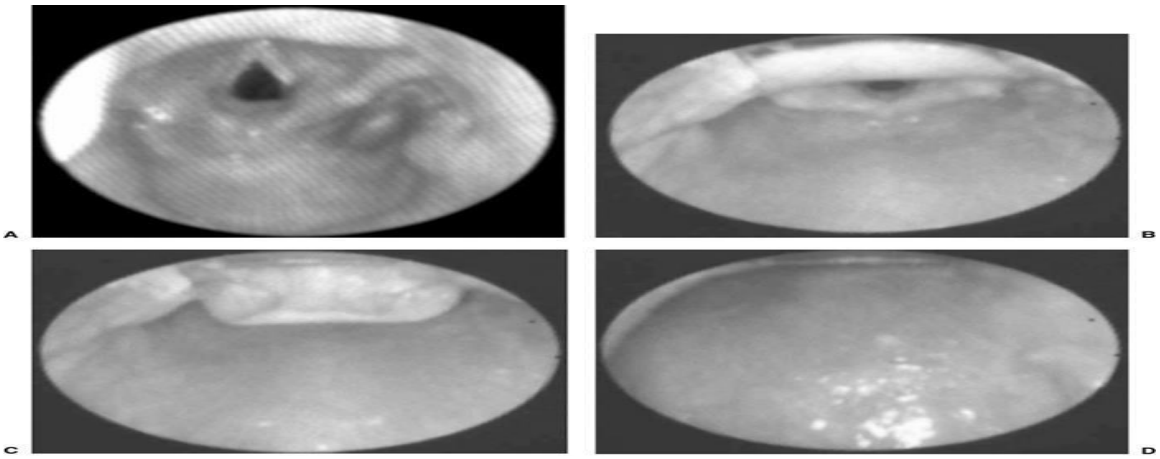


Laryngeal View: (this is the view you come across while doing the intubation)



Laryngeal view scoring system (Cormack-Lehane grading system)

Intraoperative while you're intubating.



A. **Grade I:** you can see the *epiglottis* at the top and the glottic opening (Full view of glottis). Easy intubation
B. **Grade II:** the *Posterior edge* of the epiglottis (posterior commissure of the glotic opening)
C. **Grade III**: only the *tip* epiglottis. Difficult intubation
D. **Grade IV**: no structure can be seen. Difficult intubation.

Difficult airway

This is a morbid obese (definition of morbid obesity → BMI>40) **patient with no head extension or neck flexion**

Example: Morbid obesity you place a **wedge** under the shoulder to create a thyromental distance (≥6.5cm) + Sternomental distance (≥12.5) to have an ample space for intubation.

Nowadays for obese patients: we raise the head to improve the ventilation and we use **glidescope** for intubation.

The LEMON Approach

For difficult intubation (Done pre-op)

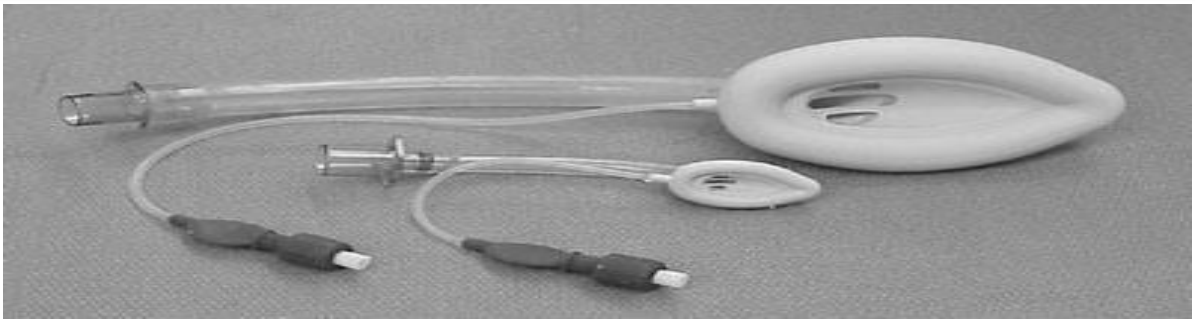
- **LOOK EXTERNALLY:** Abnormal facies, unusual anatomy or facial Trauma.
- **EVALUATE** (3-3-2 rule): 3 fingers between the incisors, 3 fingers along the floor of the mandible b/w the mentum and the neck mandible junction (If thyromental distance > 6.5cm≈3 fingers, the patient will not have difficult intubations) & 2 fingers in the superior laryngeal notch. This predicts difficulty in visualizing the glottis.
- **MALLAMPATTI SCORE:** III predicts difficulty and IV predicts extreme difficulty.
- **OBSTRUCTION/ OBESITY.**
- **NECK MOBILITY.** (If patient can't move his neck he won't be able to do sniff position)

Glidescope

Has a blade like the laryngoscope. It is connected to a video screen to see the glotic opening. Under vision you're able insert the scope from the center to visualize the structures and easily intubate unlike the laryngoscope

It is very beneficial for patients with anticipated difficult intubation e.g. obese patients and patients with cervical injury → no neck mobilization

LMA (Laryngeal Mask Airway): comes in various sizes and shapes



Indicated when you are not able to intubate or for short procedures (1:30 -2 Hours)

Example: A patient with bronchial asthma scheduled for a hand surgery or removal of foreign body (short procedure)

Not used in emergencies **or laparoscopic surgeries** like laparoscopic cholecystectomy because the abdomen will be distended so there is high chance of regurgitation and aspiration.

* LMA lies over the glottic opening so the uvula will not block the airway, while the ETT goes inside the trachea

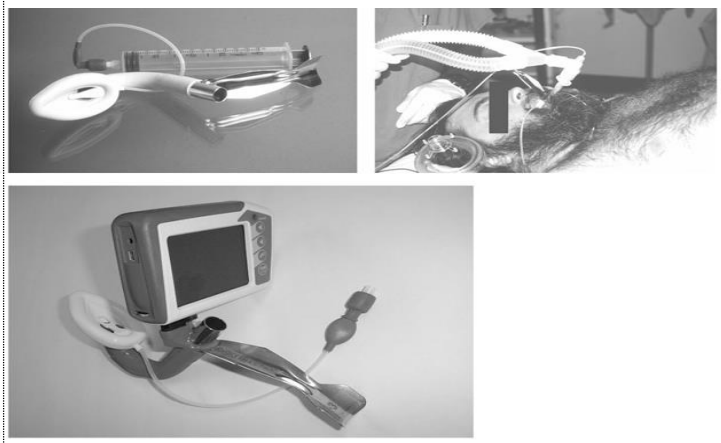
Advantages:

Avoids trauma to the trachea

Disadvantages:

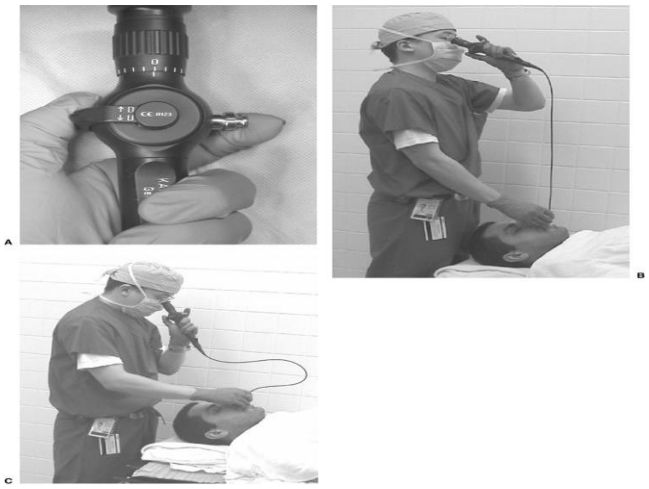
Aspirations and regurgitation. Because it lies over the laryngeal opening not inside the trachea.

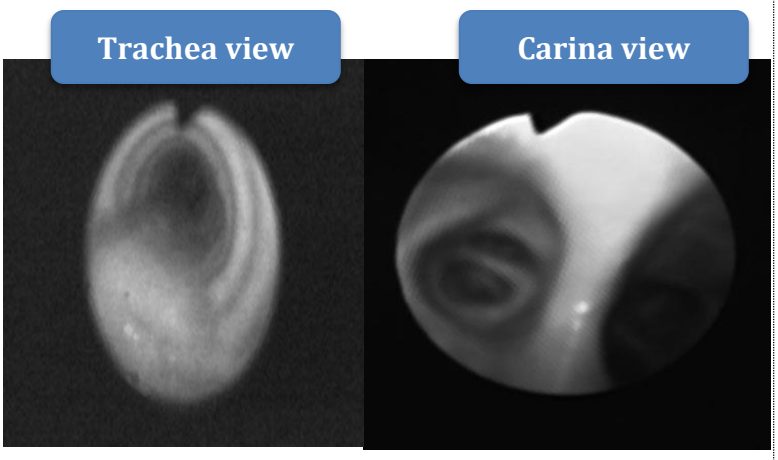
Fast track LMA



It is made in such shape to be able to slide an endotracheal tube through the hole in between. There is a flap and once you put the **ETT** the flap goes up → **No risk of Aspiration**

Fiber optic intubation





It is used when there is pathology in the airway and difficult intubation

The patient is in an awake state. Using local anesthesia, insert the apparatus and ask the patient to swallow like a nasogastric tube and it will go through the trachea

There is a camera attached at the end of the fiber optic bands which allows the anesthetic to visualize the tracheal & carina

It is used in one lung ventilation & in masses located in the mediastinum (if the patient stops breathing after administering the medication. The mass will compress the trachea)

Induction agents (in a separate pharmacology lecture)

1. **Opioids – fentanyl** (to reduce the requirement of anesthetic induction and inhalation agents)

If used in high dose it will result in chest wall rigidity hence difficulty ventilating the patient.

2. **Induction**

   IV: Propofol (mostly used, causes hypotension), **Thiopental and Etomidate** (Etomidate is used in hemodynamically unstable patients & in patients with cardiac diseases. because It prevents hypotension).

   Inhalational: we use it in patients where we suspect difficult ventilation or in pediatric patients who don't have cannulas.

3. **Muscle relaxants:**
   - Depolarizing – **Succinycholine** used in Rapid sequence induction & Pregnant ladies (No reversal Agent).
   - Nondepolarizing → Antagonist: Neostigmine

- Long Acting
- Intermediate acting: takes 3-5 minutes to start affecting

Rocuronium. If given in high doses (from 0.6 to 1.1 you can intubate the patient in 1 minute) Rocuronium Antagonist: Sugammadex

- Short acting:

Optimal Condition for intubation:

- Patient is not moving - Sleeping
- Muscles are relaxed

Induction

- IV induction used in most patients.
- Inhalation induction: Isoflurane, sevoflurane (mainly used), Desoflurane (Pungent smell causing spasms) & Halothane not used anymore due to Hepatotoxicity

} Mainly used in the maintenance phase

Inhalation induction Indication:

1. Pediatrics without IV lines
2. Patients with anticipated cessation of breathing (Patient with tracheal stenosis if you give them IV induction and Muscle relaxants the trachea will be more stenosed.

Therefore you must keep the patient in a much physiological state as possible →make him/her sleep with an inhalational agent and intubate without using muscle relaxants)

General anesthesia

- Reversible loss of consciousness
- Analgesia
- Amnesia
- Some degree of muscle relaxation

Intraoperative management

- **Maintenance:** the aim is to achieve a balanced anesthesia

  Inhalation agents: N2O (No Longer used) Used O2 40% and air60%, Sevoflurane, Desflurane, Isoflurane

  TVA (Total IV agents): Propofol (when you don't use inhalation agents!!)

  In case of spine surgery and the surgeon doesn't want you to use any muscle relaxant because they need to check the nerve stimulation to the muscles,

you use Total IV agents. You don't use inhalational b/c it affects their readings.

Opioids: Fentanyl, Morphine(long acting).
Muscle relaxants

Aim: Balanced anesthesia

- **Monitoring** depends on the patient's condition (ECG, Capnograph, pulse oximeter, Blood pressure cuff, temperature measurement, urine output & blood loss measurement) in all patients + nerve stimulator if you give muscle relaxant.

- **Position** – supine, lateral, prone, sitting or lithotomy (in Lithotomy position all the structures will go up which might cause some lung injuries if not careful)

- **Fluid management**

- Crystalloid vs colloid (for every 1ml of blood loss you give 3ml Crystalloid Or for every 1ml of blood loss you give 1ml colloid)

- NPO fluid replacement: (MCQ) 4, 2, 1 Rule formula

1st 10kg weight: 4ml/kg/hr.

2nd 10kg weight: 2ml/kg/hr, and 1ml/kg/hr thereafter.

- **Intraoperative** fluid replacement (Once the surgeon starts):

Add on maintenance

Only during the surgery:

Minor procedures 1-3ml/kg/hr. e.g.: Laparoscopic procedure

Major procedures 4-6ml/kg/hr.

Major abdominal procedures 7-10/kg/ml

Example: A patient is **40kg**. The 1st 10kg = 10X4 = 40ml/hr

2nd 10kg = 10X2 = 20ml/hr . 3rd 20kg = 20X1 = 20ml/hr

So the maintenance = 40+20+20= 80 ml/hr. You have to add insensible loss, urine output & blood loss.

✦ A 5kg pediatric patient's fluid replacement will be: 5X4 = 20 ml/hr

- ***Emergence:*** *"Waking the patient up"*

1. Turn off the agent. (inhalation or IV agents)
2. Reverse the muscle relaxants. (For non depolarizing muscle relaxant) Neostigmine (anticholinesterase) -> SE: bradycardia which could be treated by Atropine.
3. Return to **spontaneous ventilation** with adequate ventilation and oxygenation.
4. Suction upper airway.
5. Wait for patient to wake up and follow command.
6. Hemodynamically stable.

- Then you can extubate the patient and shift them to the post anesthesia care unit (PACU) or the HDU "High dependency unit" for monitoring or you can keep the patient intubated and decrease the agent's concentration without reversing or antagonizing the muscles relaxant →shift them to the SICU intubated/ventilated (e.g. craniotomy ending up with respiratory depression of any surgical complication) → Usually planned beforehand .
- If the patient was shifted to ICU he/she is no longer your problem.

Postoperative management the recovery room

- **Post-anesthesia care unit (PACU)**
  - Oxygen supplement
  - Pain control
  - Nausea and vomiting
  - Hypertension and hypotension
  - Agitation
- **Surgical intensive care unit (SICU)**
  - Mechanical ventilation
  - Hemodynamic monitoring

General anesthesia- Complications

- **Respiratory complications**
    - Aspiration
    - Airway obstruction and pneumonia
    - Bronchospasm
    - Atelectasis → if the endotracheal tube was inserted in the right bronchus and you missed it, the left lung's alveoli will eventually stop functioning resulting in atelectasis (collapse) of the left lung
    - Hypoventilation →central nervous system or analgesia wasn't adequate over dosage of competitive relaxants or cholinesterase deficiency
- **Cardiovascular complications**
    - Hypertension and hypotension
    - Arrhythmia
    - Myocardial ischemia and infarction → especially with diabetic patients that cannot tolerate the surgical stress
    - Cardiac arrest
- **Neurological complications**
    - Slow wake-up (The cause could be Hypothermia -> reduced metabolic rate -> slow down medications elimination)
    - Stroke
- **Malignant hyperthermia**: a rare life-threatening condition that is usually triggered by exposure to certain drugs used for general anesthesia, specifically the volatile anesthetic agents and the neuromuscular blocking agent, succinylcholine. Resulting in an sudden unexplained rise of the temperature (Hyperpyrexia) 1-2º per hour + ↑End tidal CO2 although ventilating (60-65) the normal=45 usually patients don't survive . ***Treatment : dantrolene***

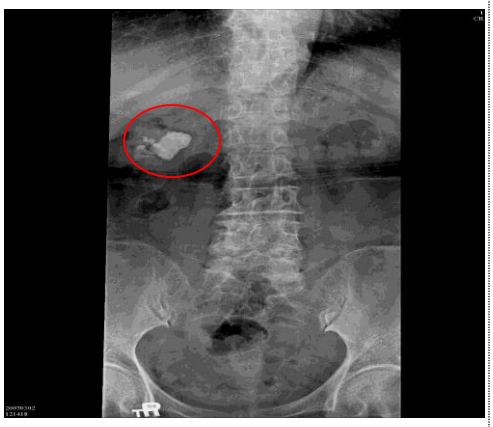
Remember! Nobody dies because you can't intubate but patients die because you can't ventilate. (Ventilation is the key of anesthesia)– Dr.Sadia

Case Report - Arterial oxygen desaturation following PCNL (Percutaneous nephrolithotomy)

1. Patient: 73 y/o Female (BW 68 kg, BH 145 cm (BMI 32→ Obese))

Chief complaint: Right flank pain (stabbing, frequent attacks) General malaise and fatigue

Past history: Hypertension under regular control+ Senile dementia (mild) ASAII



(Percutaneous nephrolithotomy)

2. Preoperative diagnosis: Right renal stone (3.2 cm)

Operation planned: Right PCNL

3. Pre-anesthetic Assessment

EKG: Normal sinus rhythm
CXR: Borderline cardiomegaly & tortuous aorta
Lab data: Hb 10.5 / Hct 33.2

Within the normal range:
- BUN 24 / Creatinine 1.1
- GOT 14
- PT, aPTT WNL

Pre-op CXR

4. Anaesthetic Technique

General anesthesia with endotracheal intubation. Standard monitoring apparatus for ETGA.

Induction:

- Fentanyl 1ug/kg
- Propofol 2mg/kg
- Succinylcholine 80 mg
- Atracurium 25 mg

- In those patients we try to reduce the dose.

Endotracheal tube reinforced (ID 7.0-mm) @ 19cm
Maintenance: Isoflurane 2~3% in O2 0.5 L/min **Position**: prone
Blood loss: 300 mL → PRBC 2U

5. Intra-operative Events

Stable hemodynamics. **Abnormal findings 30 minutes after surgery started.**

Increased airway pressure 35~40 mmHg (normal.18-20mmHg)

SpO2 dropped to 90~95% (suspect that the ventilator cannot push air because there is an obstruction e.g. Bronchospasm, one lung ventilation)

Bilateral breathing sounds were still audible then

Management: Solu-cortef 100 mg IV stat

Aminophylline 250 mg IV drip

Bricanyl 5 mg inhalation

Bronchodilators assuming that the patient suffered from bronchospasm

ABG Data:

pH	7.2
PaO_2	90.5
$PaCO_2$	No(45)66.8
HCO_3^-	26.0
BE	-2.4
Na^+	143.0
K^+	4.0
Ca^{2+}	1.1
Hb/Hct	11.4/36.1

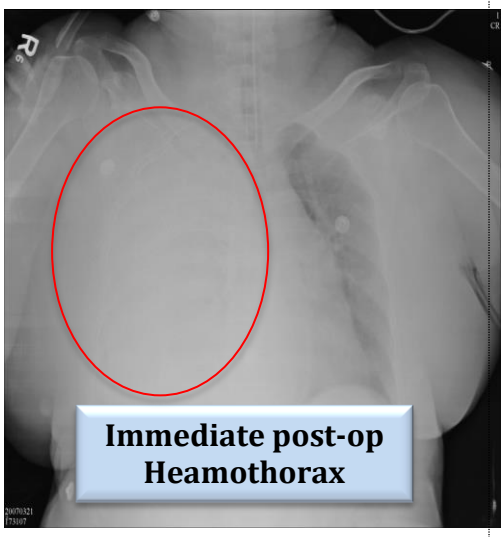
6. Post-operative Course

The patient's condition continued until the end of surgery.

SpO_2 90~92% after the patient was placed in the supine position again with diminished breathing sound over right lower

The patient was transferred to SICU for further care*

Chest X-ray was followed in SICU



Immediate post-op Heamothorax

7. Postoperative Course:

Pigtail drainage in SICU. **Pleural effusion**: bloody **RBC** numerous **WBC** 7800 (Seg 94%) **Gram stain**(-)
Impression: Right hydrothorax and hemothorax

- ✓ Extubation and transfer to ordinary ward
- ✓ Pigtail removed

S/P Pigtail drainage

Summary

General anesthesia is described as a reversible state of unconsciousness with inability to respond to a standardized surgical stimulus.
This involves the triad of: **unconsciousness**, **analgesia** (Pain free), **and muscle relaxation**.

Always take **history** during preoperative anesthetic evaluation, don't forget to ask about previous surgeries and any difficulties in anesthesia as well as any history of malignant hyperthermia.

Preoperative evaluation should include:

1. Risk of anesthesia
2. Physical status classification (ASA class)
3. Airway examination- Mallampati classification
4. NPO status
5. Anesthetic Plan

NPO: No solid food intake 8 hours prior to induction and no liquid 4 hrs before induction, no clear water 2 hrs before induction *Pediatrics should stop breast milk feeding 4 hrs before induction (formula milk should be stopped 6-8)*

Normal thyromental distance is *≥6.5cm*
Sternomental distance is *≥12.5cm*

Pre-oxygenation prior to induction of anesthesia is vital, to maintain a decent oxygen reservoir and avoid hypoxia during induction and intubation.

RSI (Rapid sequence induction): is used in emergencies or with patients who are considered as "full stomach" (trauma patients or pregnant patients).

Sniffing position (Neck flexion and head extension) is used to allow easier visualization of the airway.

LMA is never used in laparoscopic procedures due to high risk of aspiration.

In majority of cases, IV is used for induction of anesthesia while inhalational agents are used for maintenance.

NPO fluid replacement rule → 4,2,1 rule --> 1st 10 KGs (4ml/kg/hr) for the 2nd 10KGs (2ml/kg/hr) and for the remaining KGs (1ml/kg/hr).

Patients do not die from failure to intubate but from failure to oxygenate.

Remember, the objective after failed intubation is oxygenation, oxygenation, followed by **OXYGENATION**.

MCQ's :

1. Which of the following is considered Class III Mallampati?

    a. *Presence of uvula, pillars, soft and hard palate visible*
    b. *Presence of pillars, soft and hard palate visible*
    c. *Presence of soft and hard palate visible*
    d. *Presence of hard palate visible*

2. Mallampati classification can predict up to ___ % of difficulties in intubation
    a. *30%*
    b. *50%*
    c. *80%*
    d. *100%*

3. Physical status classification of ASA Class IV is:
    a. *A patient with severe systemic disease*
    b. *A moribund patient who is not expected to survive with or without the operation*
    c. *A patient with mild systemic disease*
    d. *A patient with severe systemic disease that is a constant threat to life*

1. C
2. B
3. D

For mistakes or feedback

Anesthesiateam432@hotmail.com