

A photograph of an operating room. Several surgeons in blue scrubs and caps are gathered around a patient on a table, illuminated by bright surgical lights. Medical equipment, including an IV stand with bags, is visible in the background. The scene is slightly blurred, suggesting a candid moment during a procedure.

# GENERAL ANAESTHESIA

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# ..aims

- What do anaesthetists do
- Basic anaesthetic management
- Drugs, gases, monitoring, machines



# The role of anaesthetist

- Ensures safe anaesthesia for surgery
- Is responsible for patient safety in theatre
- Ensures the anaesthetic machine and drugs are checked and correct
- Liaise with the surgeon and scrub team – ensure that the operation can proceed smoothly
- Keep an anaesthetic record
- Makes a postoperative plan

# Anaesthetic plan

- Preoperative
- Intraoperative
- And postoperative management

# Anaesthetic plan

- **Preoperative**
- Intraoperative
- And postoperative management

# Preoperative management

- Anaesthetic assessment :history and examination
- Relevant investigations : lab, CXR, ECG
- Optimise chronic condition
- Plan for intra and post op pain relief
- Discuss ev. HDU/ICU post op bed for patient
- Consent the patient
- Prescribe premedication

# Anaesthetic assessment

- Previous surgery (GA, LA, complications)
- Medical hx, Medication, FH
- Allergies
- Last meal, drink !
- Teeth
- Pregnancy
- Examination: airway assessment, neck, back + general physical exam.

# Risk assessment - ASA grade

- I Healthy patient
- II Mild systemic disease, no functional limitations
- III Severe systemic disease- definite functional limitation
- IV Severe systemic disease that is a constant threat to life
- V Moribund patient not expected to survive 24 hours with or without operation



# Premedication

- Sedation/**anxiolysis** (Benzodiazepines)
- Analgesia only if pain (opioids)
- Reduce airway secretions + heart rate control + hemodynamic stability
- Prevent bronchospasm
- Prevent and/or minimize the impact of **aspiration**
- Decrease post-op nausea/vomiting

# Consent

- Discuss all options GA/regional
- Risks versus benefits
- Complications – common, rare and serious
- Make pain relief plan



# Complications

NO RISK = NO ANAESTHESIA

- Common (someone in a street)
  - PONV, sore throat, backache, headache, dizziness
- Rare and serious (someone in a big town)
  - Damage to the eyes, anaphylactic shock, death, equipment failure

# Mortality of anaesthesia (ASA I)

- Risk of death or brain damage
  - 1 : 100 000 – 200 000
- Dying in a plane crash
  - 1 : 200 000
- Dying in a car crash
  - 1 : 5000



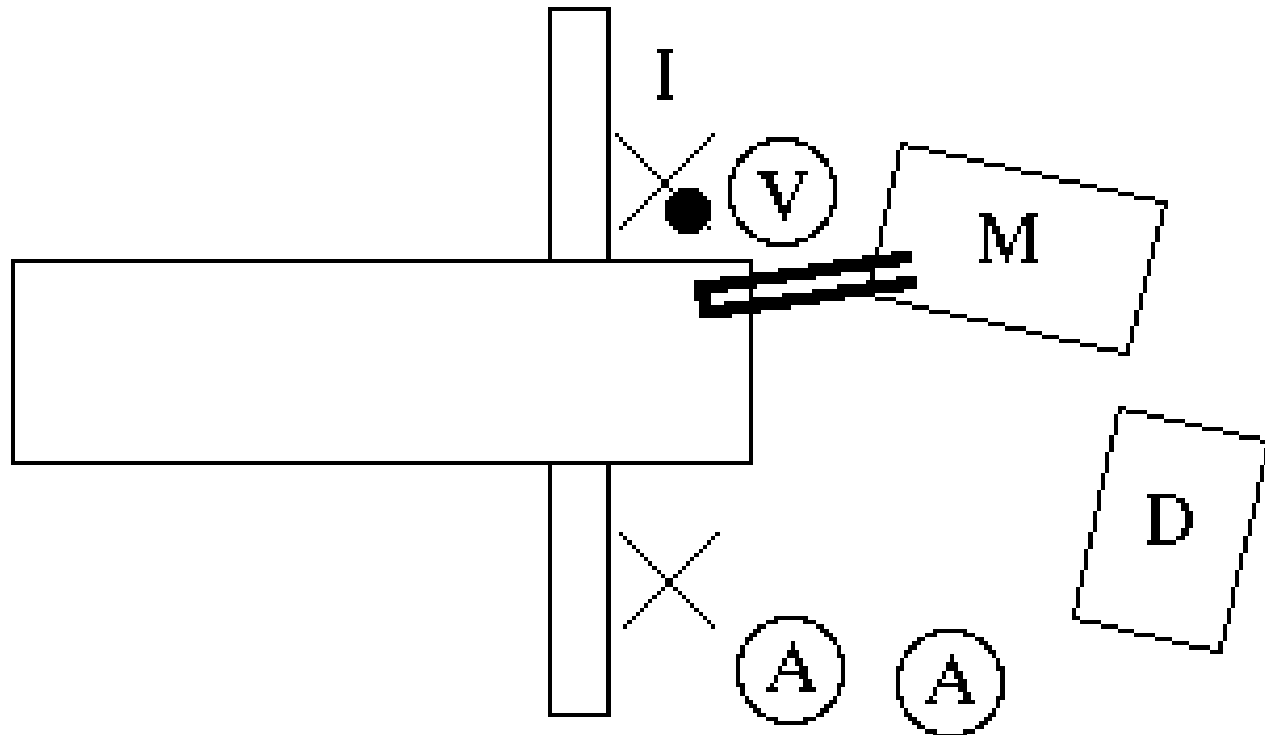
# Anaesthetic plan

- Preoperative
- **Intraoperative**
- And postoperative management

# Teamwork !



# Operating theatre



# Operating theatre

- Allow surgery, ECT
- Allow diagnostic method (CT, MRI)





# History

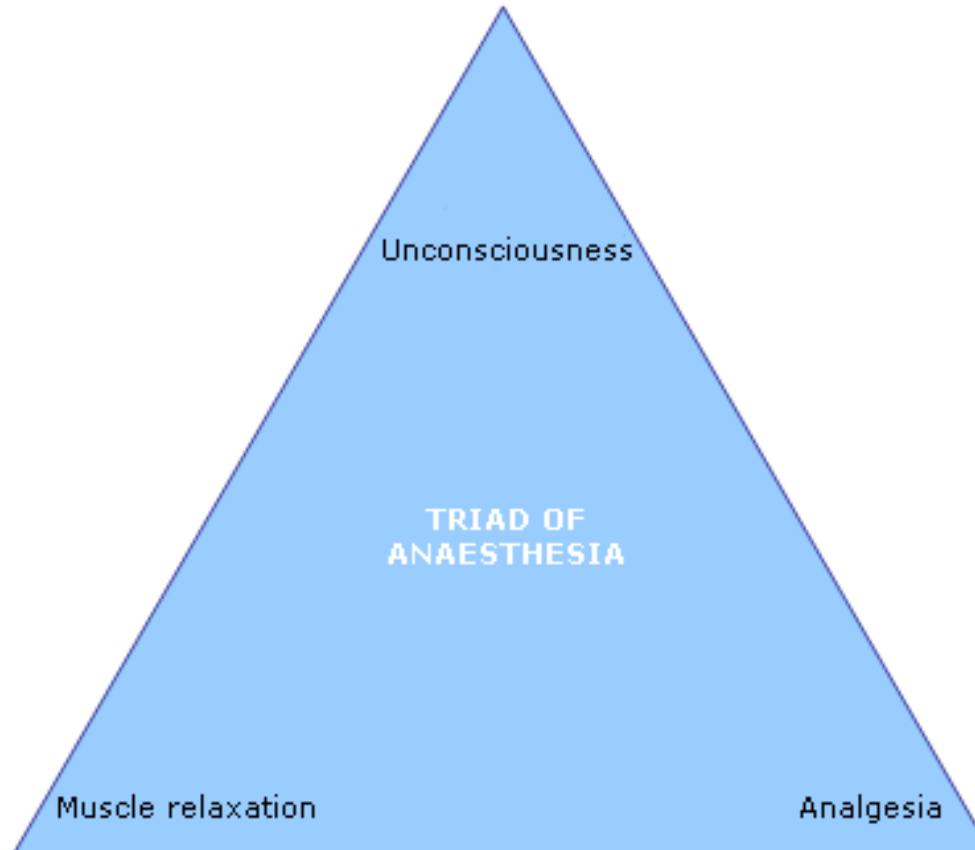
- Opium (Egypt, Syria)
  - Hippokrates 400 BC ease pain
- 1555 Andreas Vesalius - arteficial ventilation through tube between vocal cords, ventricular fibrilation (animals)
- Valerius Cordus (1546) ether
- 1773 N<sub>2</sub>O Joseph Priestley (1733-1804)



# Beginning of GA

- October 16th 1846 ether general anaesthesia  
Boston dentist William Thomas Green Morton  
to Gilbert Abbott (tumor of mandibule)
- February 6th 1847 Prague - first czech ether  
anaesthesia - Celestýn Opitz
- 1895 direct laryngoscopy Alfred Kirstein  
in Berlin.

# AIMS OF ANAESTHESIA



# Triad of anaesthesia

- **Neuromuscular blocking agents** for muscle relaxation
- **Analgesics**/regional anaesthesia for analgesia
- **Anaesthetic agents** to produce unconsciousness

# Stages of anaesthetics

- **Induction** – putting asleep
- **Maintenance** – keeping the patient asleep
- **Reversal** – waking up the patient



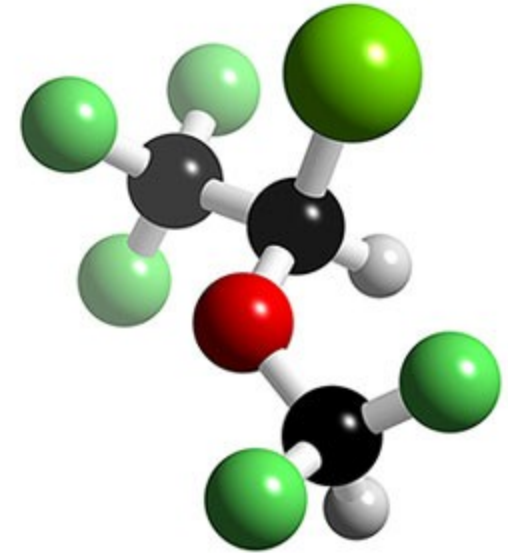
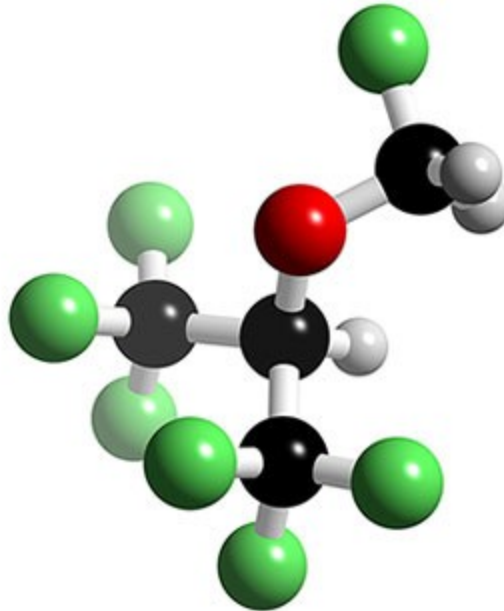
# Intravenous anaesthetics

- Onset of anaesthesia within one arm – brain circulation time – 30 sec
- Effect site → brain
  - Propofol
  - Thiopentale
  - Etomidate



# Anaesthetic gases

- Isoflurane
- Sevoflurane
- Halothane
- Enflurane
- Desflurane
- $N_2O$  – nitrous oxide



# Anaesthetic gases

- Used for maintenance, sometimes induction
- Anaesthetic 'gases' are administered via **vaporizers**





# Intravenous anaesthetics

## Induction + maintenance



# Muscle relaxants - NMBs

- Tracheal intubation
- Surgery where muscle relaxation is essential
- Mechanical ventilation
  
- Place of effect - neuromuscular junction
- History - South American Indians (kurare)



# Analgesics

- Simple : paracetamol, NSAID
- Opioids : morphine, fentanyl
  - Via opioid receptors



MORPHEUS- GREEK GOD OF DREAMS

# Monitoring

- Basic:
  - NIBP, ECG, Sat, ETCO<sub>2</sub>, FiO<sub>2</sub>
- Extended:
  - Nerve stimulator, temperature, diuresis, IBP, CO, CVP, perioperative acid-base, lab

# Anaesthetic machine

- Mix gases, ventilate, preserve heat and moisture

High pressure

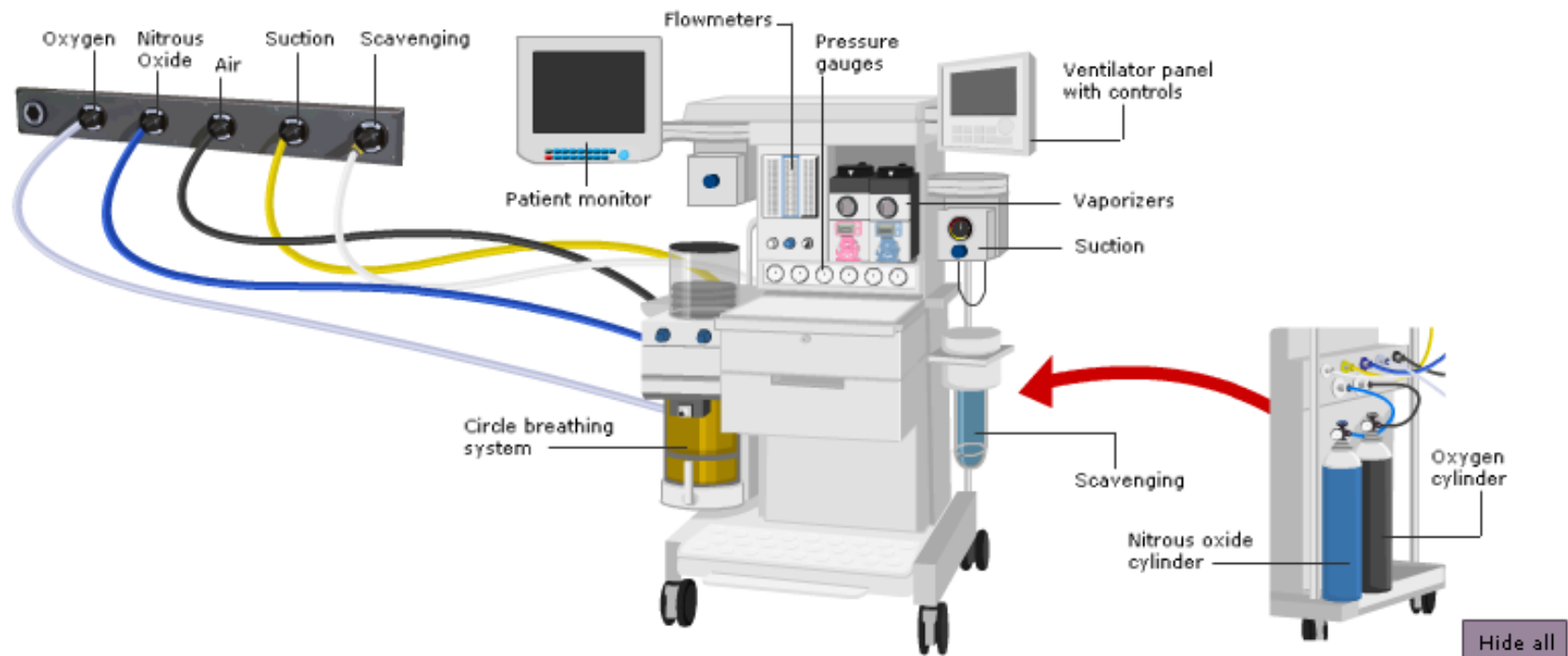
central gas supply/ cylinder

Low pressure system

- Flowmeters
- Vaporisers
- Breathing circuit:
  - bag + tubes
  - valves (uni directional)
  - CO<sub>2</sub> absorber
- Ventilator



# Anaesthetic machine



# Airway management

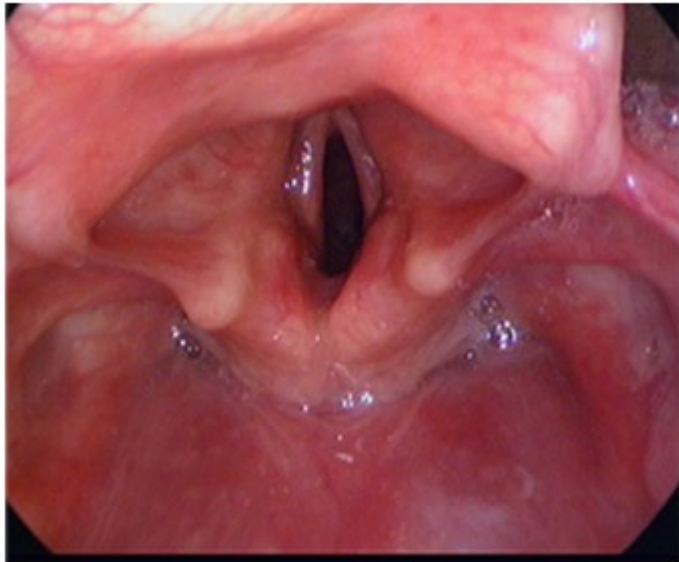
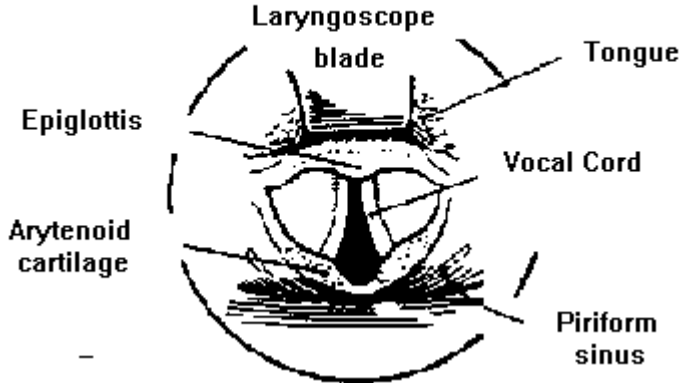
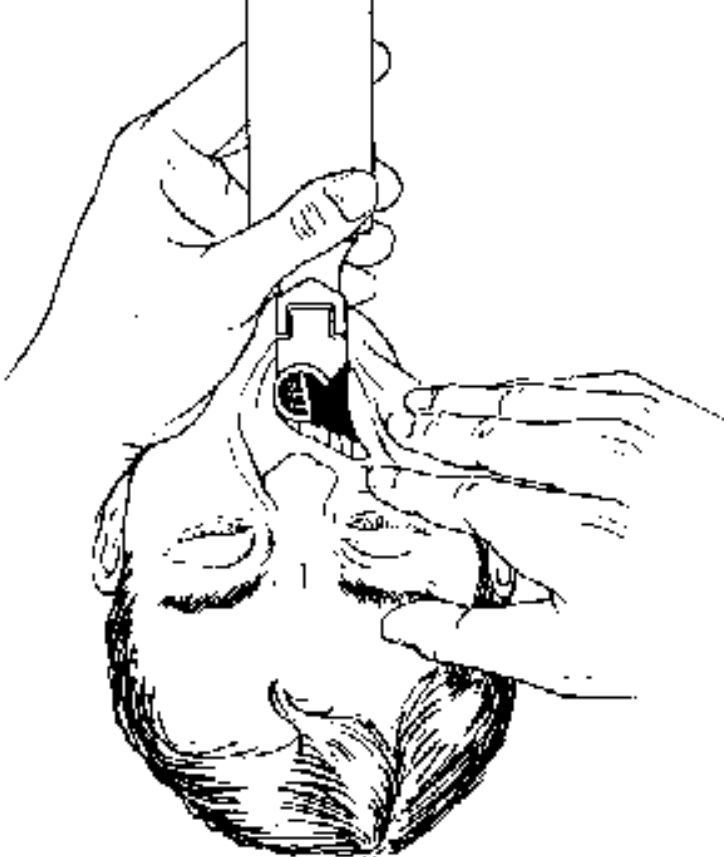
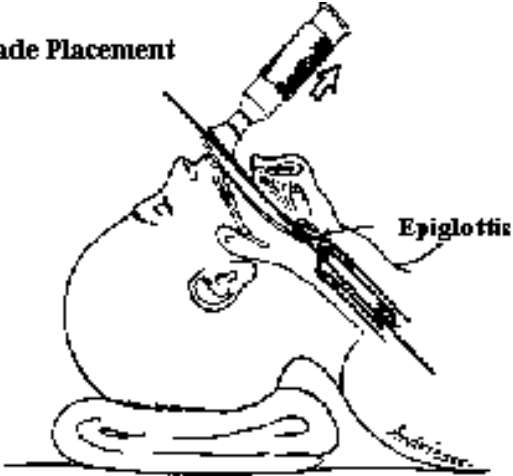
Indication for intubation:

- Need of relaxation or PPV
- Full stomach
- Orotracheal intubation, nasotracheal intubation with direct laryngoscopy
- Tracheotomy
- Laryngeal mask
- Cricothyrotomy



# Intubation

Straight Blade Placement





# Laryngeal Mask



# Anaesthetic plan

- Preoperative
- Intraoperative
- And **postoperative management**

# Postoperative care

- ICU/HDU or ward
- Monitoring according to type of surgery and patient's condition
- Post-operative pain control
- Lab check up
- Infusion therapy, blood loss monitoring

# Questions ?

