



General anaesthesia

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<http://www.virtual-anaesthesia-textbook.com>

Definition

- 📄 loss of consciousness, feeling, pain. No reaction to stimuli
- 📄 allow therapy (surgery, electroshock)
- 📄 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 – oleum vitreolum dulce

☞ Paracelsus (1547) - analgetic účinky effect of ether

☞ Severino (1646) - kryoanaesthesia – např.
v napoleonských válkách - Larey)

☞ 1773 N₂O Joseph Priestley (1733-1804)

☞ 1774 oxygen

☞ 1779 Humphry Davy - anaesthetic effect of N₂O

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.
 - 1920 direct laryngoskopy to clinical praxis Magill and
Rowbotham

Patient + GA

- ☰ preoperative anaest. visit
- ☰ premedication
- ☰ venous line
- ☰ monitoring
- ☰ induction
- ☰ (airway protection)
- ☰ maintenance
- ☰ (extubation)
- ☰ treatment of postoperative pain

record of GA

Preoperative examination

📄 history (GA, RA, complications)

📄 physical examination (neck, back)

📄 laboratory: blood cells, ions, urea, creatinin, glucose, AST, ALT, GMT, bilirubin, AB0.

📄 EKG (older 45).

📄 Xray (older 60 let).

📄 function exam

– cardiological, lung, nephro, hemato

ASA Physical Status = risk

I **Healthy** patient

II Mild systemic disease, **no functional limitations**

hypertension, smoker, mild asthma

III Severe systemic disease- definite **functional limitation**

coronary disease, COPD, DM, CHF, renal failure

IV Severe systemic disease that is a constant **threat to life**

unstable angina, burn with septic shock

V Moribund patient **not expected to survive** 24 hours with
or without operation

patient with extensive bowel infarction, polytrauma

Premedication

usually p.os - evening + morning

📄 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

Conversation before GA or RA

☞ empty stomach - last food, fluid

☞ tooth (artificial, free)

☞ weight

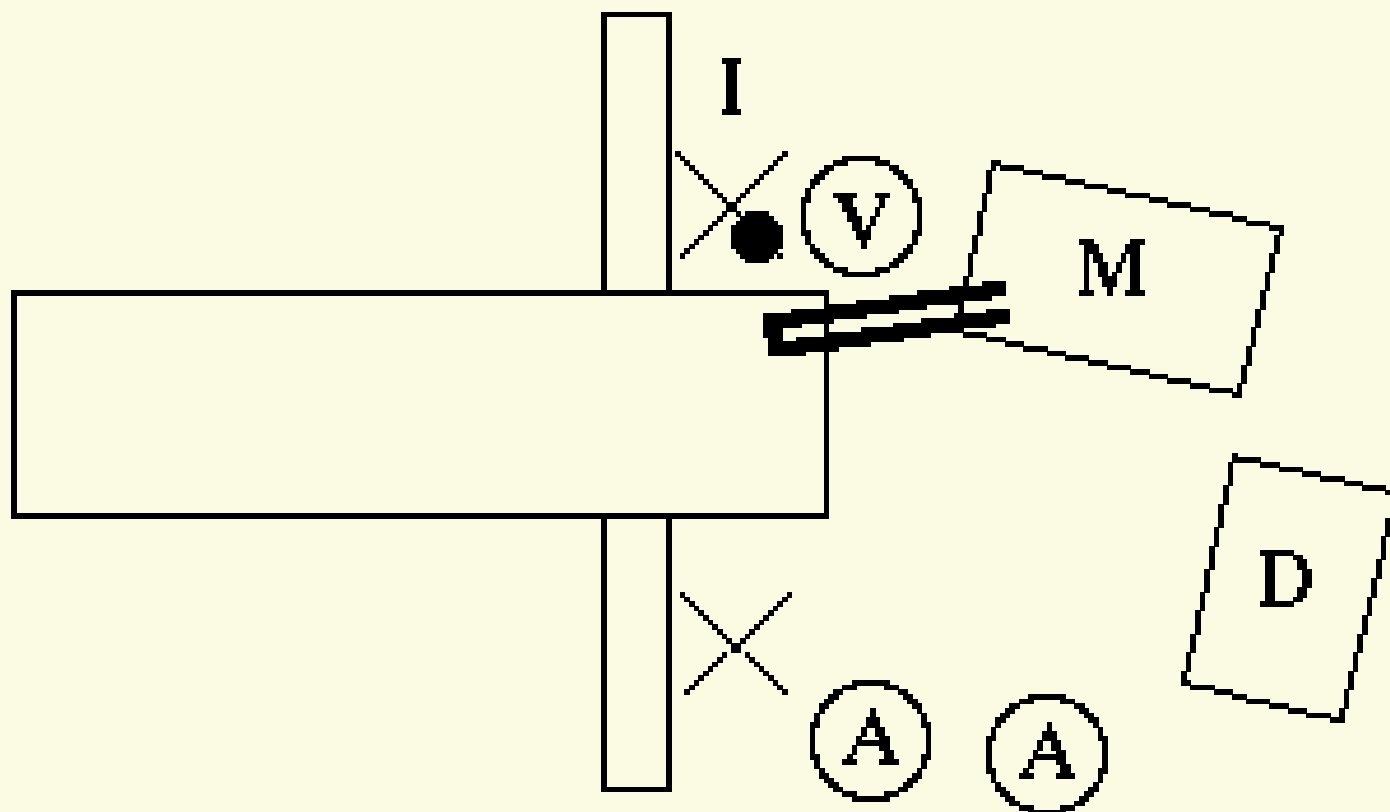
☞ allergy

☞ complication of CA in his/family history

☞ check-up questionnaire

☞ agreement with anaesthesia

O Room



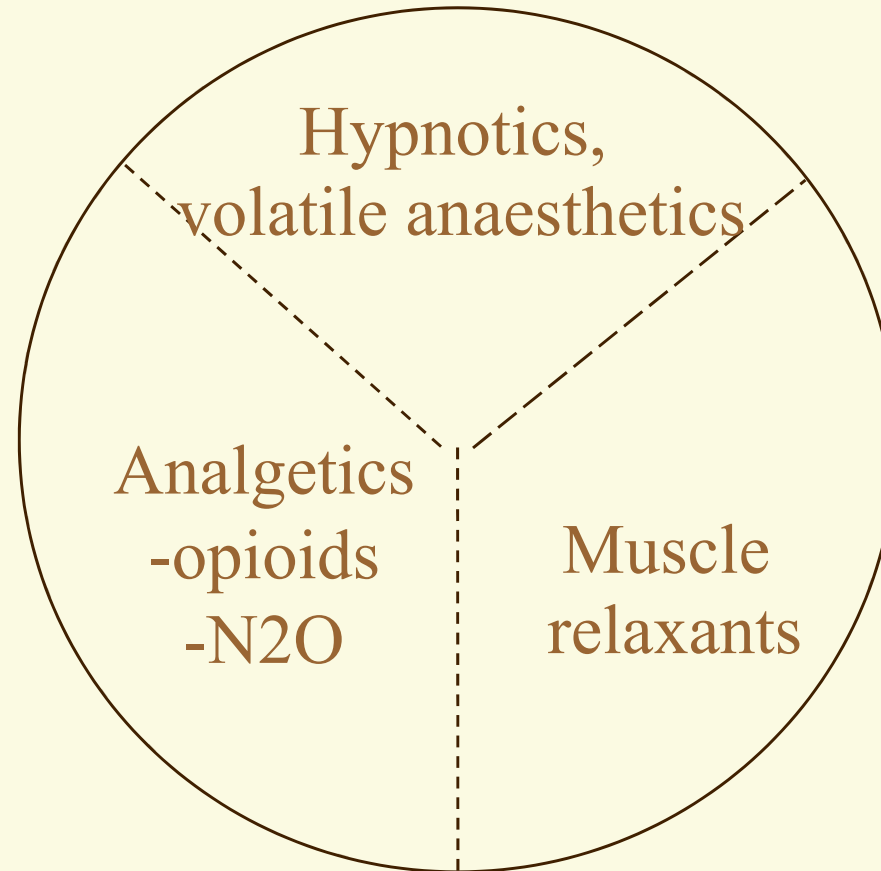
Monitoring

📄 basic: auscultation, NIBP, EKG- monitor, POX, Temperature

📄 extend: CVP, IAP, diuresis, Swan-Ganz

📄 peroperative laboratory exams

General anaesthesia



Anaesthesia machine

☞ mix gases, ventilate

High pressure - central gas / cylinder

Low pressure system

☞ flowmeters

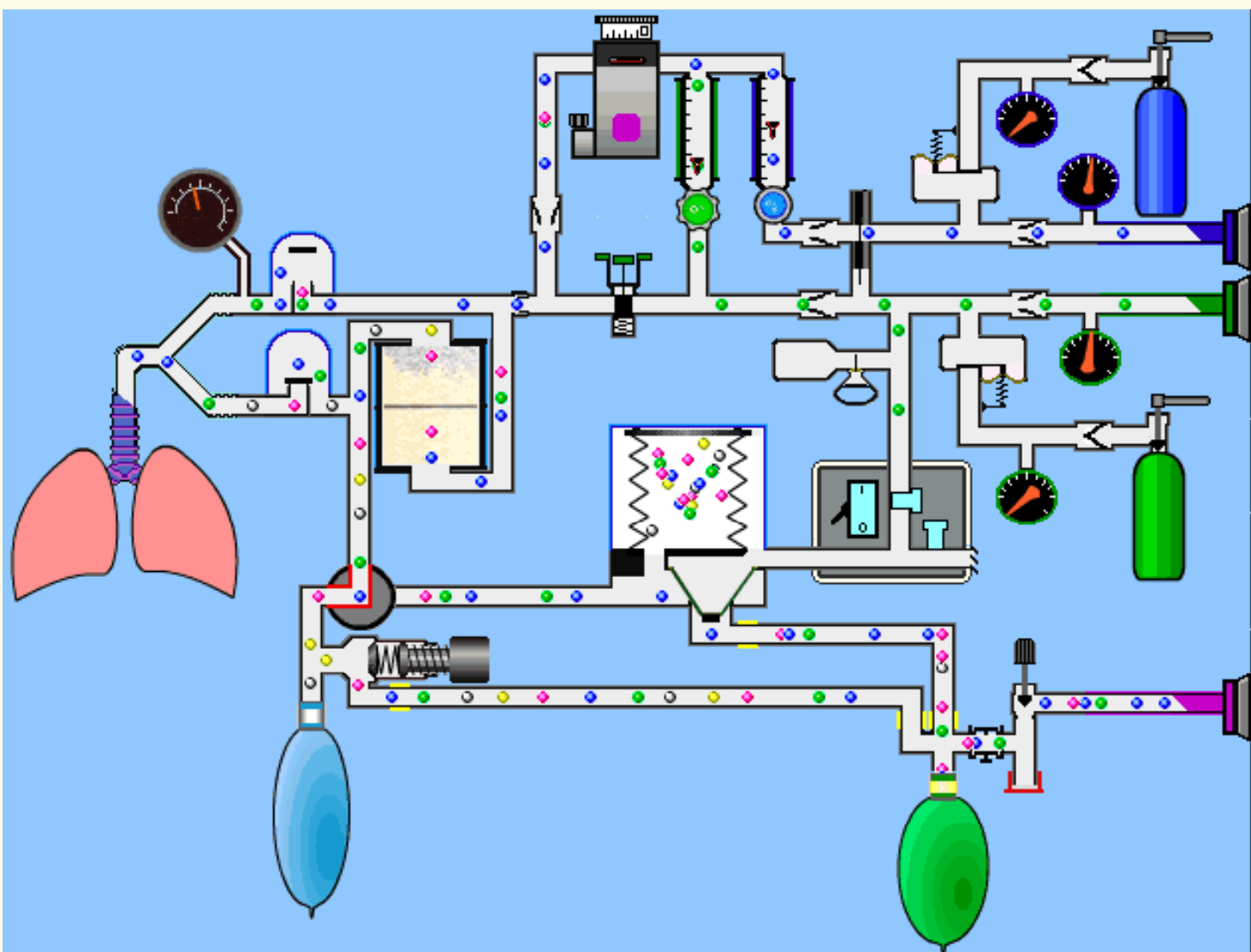
☞ vaporiser of volatile anaesthetic

☞ circuit:

- bag + tubes
- valves (one direction)
- CO₂ absorber

☞ ventilator (humidisator)





- Deutsch
- Machine Faults
- Gas Color Codes
- About the Developers
- Pause Animation
- Hide Gases
- Reset
- Help
- Email Us!



Visit us at www.anest.ufl.edu/vam

Ventilator Settings

I:E Ratio
1: **2** ▲ ▼
(1:1 - 1:4)

Tidal Volume
1000 ml ▲ ▼
(50 - 1500)

Frequency
10 breaths/min ▲ ▼
(2 - 20)

Inspiratory Pause
0 % ▲ ▼
(0 - 50)

Inspiratory Pressure Limit
60 cm H₂O ▲ ▼
(20 - 100)

Patent Pending

Intravenous anaesthetics

☰ Propofol

☰ Barbiturate: Thiopental, Metohexital

☰ Etomidate

☰ Ketamin

☰ **Narcotics = Opioids:** Fentanyl, Alfentanyl, Sufentanyl
Remifentanyl, Morphin

☰ **Benzodiazepines:** Diazepam, Flunitrazepam, Midazolam,

☰ **Neuroleptics:** Dehydrobenzperidol

Volatile anaesthetics

- Halotan, Izofluran, Sevofluran, Desfluran,

- Vaporiser (liquid --> gas)

- Lungs = gate to the body

- Brain = place of effect



Muscle relaxants

facilitate intubation, artificial ventilation, surgeon's work, not necessary

place of effect - neuromuscular junction

History - South American Indians (kurare)

anaesth. praxis from 1942

depolarizing - succinylcholinjodid

non-depolarizing - Pancuronium, Vecuronium, Atracurium, Rocuronium, ...

Run of anaesthesia

☞ Induction: i.v. / inhalation /+ airways

☞ Maintenance: inhalation, TIVA, add

☞ end of A: extubation or analgosedation +
arteficial ventilation - transport to ICU.

Airways

Indication for intubation:

📄 need of relaxation or artificial ventilation

📄 full stomach

📄 Orotracheal intubation, nasotracheal intubation with direct laryngoscopy

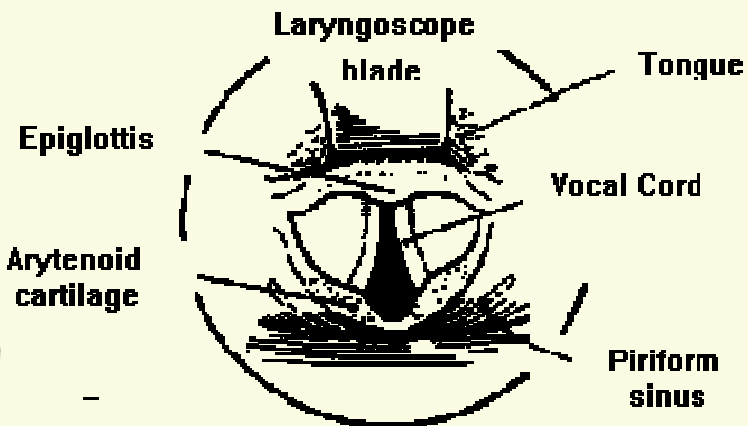
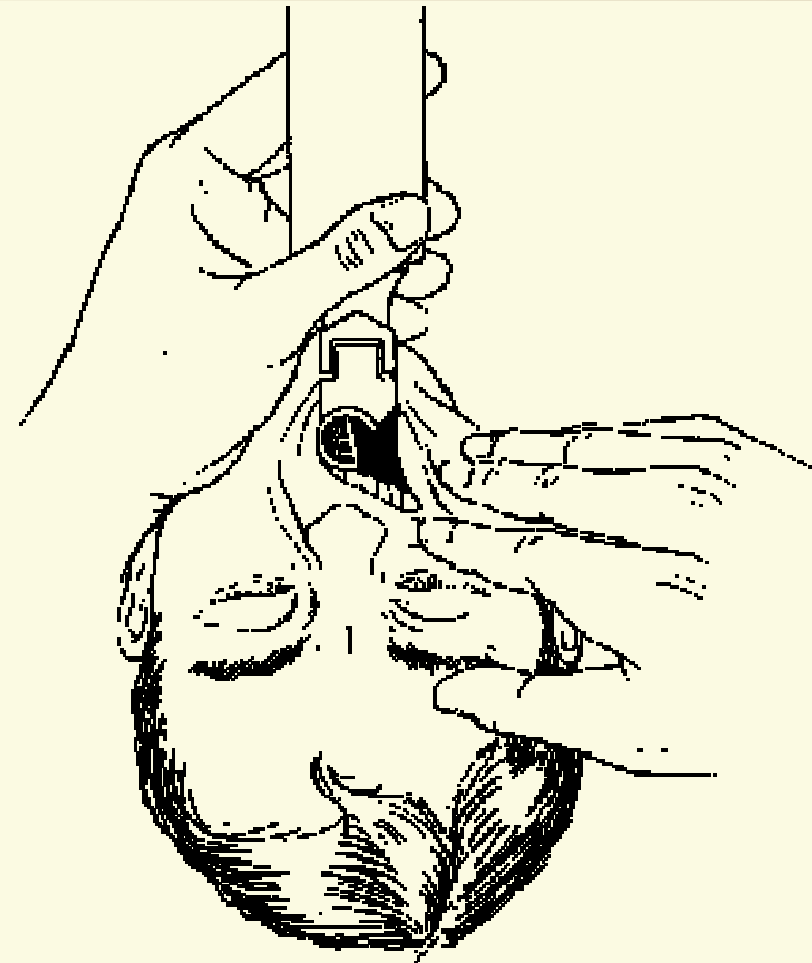
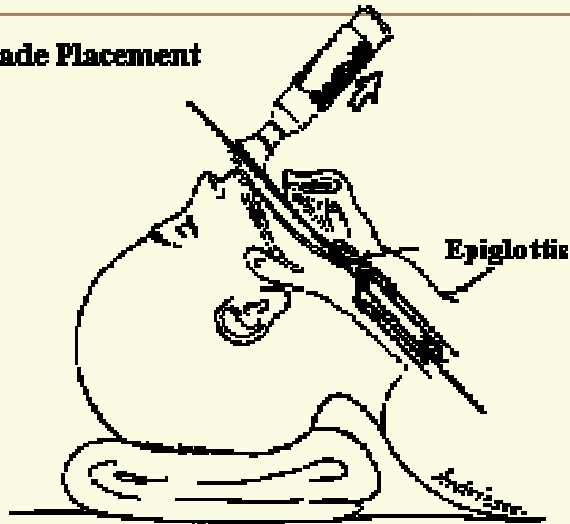
📄 Tracheotomy

📄 Laryngeal masks

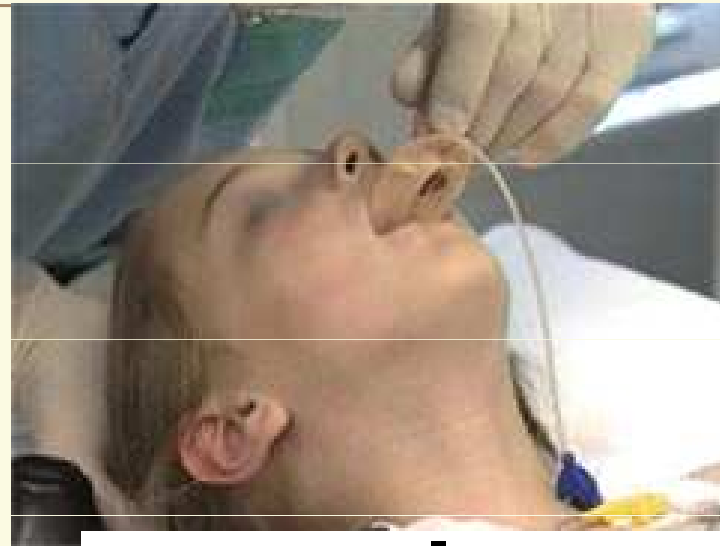
📄 Cricothyrotomy

Intubation

Straight Blade Placement



Laryngeal Mask



Infusion therapy

 see summer semester

Complications of GA

!!! No risk = no anaesthesia !!!

📄 difficult intubation, ventilation ... asfyxia

📄 aspiration of stomach fluid ... pneumonia

📄 overdose anaesthetic ... cardiovascular,
respiratory colaps

📄 malfunction of monitor, machines

📄 organ failure (AIM, dekompenstation COPD,
hepatitis, ...)

📄 malignant hyperthermia

📄 anaphylactic reaction / shock

Mortality of anaesthesia (ASA I)

📄 0,008-0,009% primary connected with A

📄 0,01-0,02% partially connected with A

📄 0,6% 6 day mortality after operation

📄 3 times danger than flying

Postoperative care

☞ ICU or standard department

☞ monitoring according to type of OP + health

☞ control laboratory

☞ treatment of acute pain

☞ infusion therapy, blood loss