

# General anaesthesia

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

# Definition

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📄 loss of consciousness, feeling, pain. No reaction to stimuli

📄 allow therapy (surgery, electroshock)

📄 allow diagnostic method (CT, MRI)

# History

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☞ 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 N<sub>2</sub>O Joseph Priestley (1733-1804)

☞ 1774 oxygen

☞ 1779 Humphry Davy - anaesthetic effect of N<sub>2</sub>O

# 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

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

record of GA

# Preoperative examination

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- 📄 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

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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

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**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

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☞ empty stomach - last food, fluid

☞ tooth (artificial, free)

☞ weight

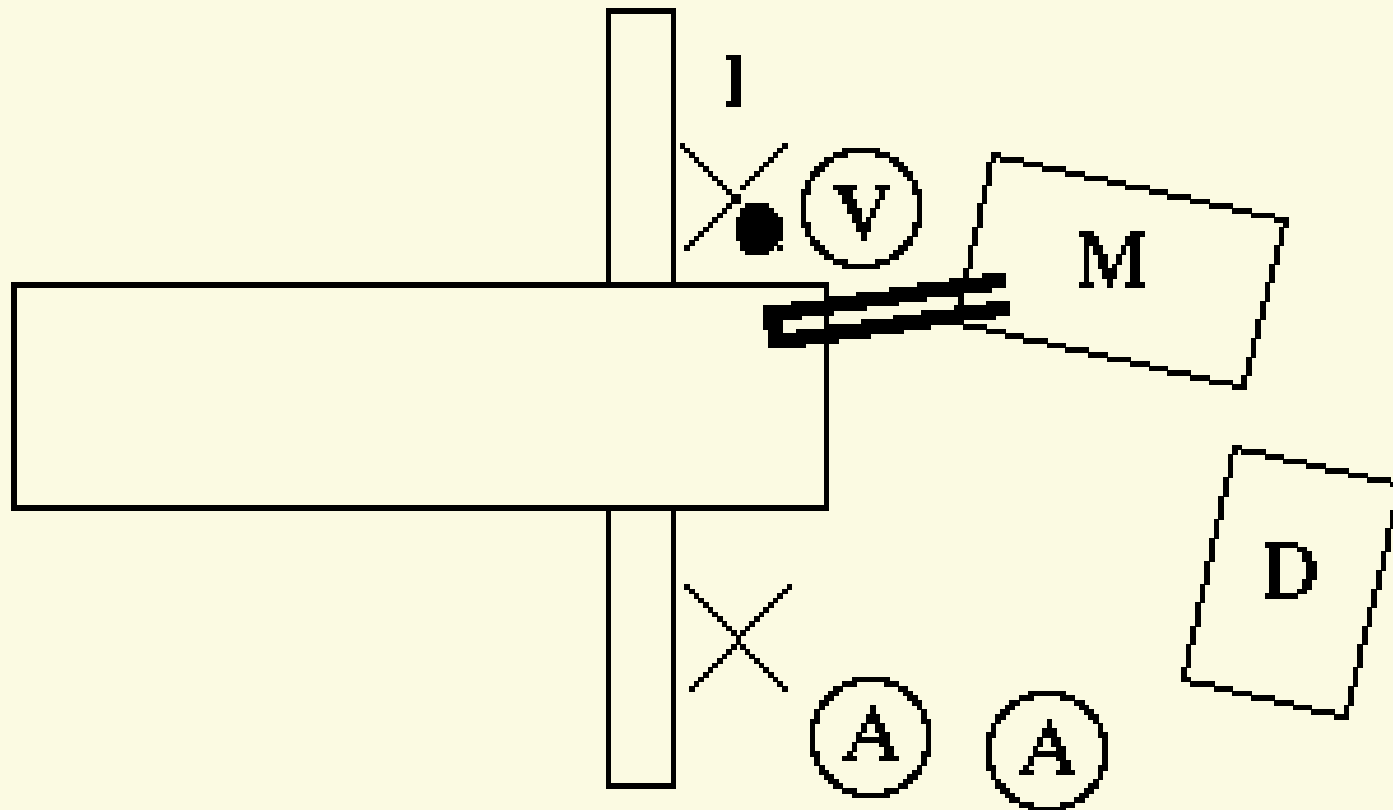
☞ allergy

☞ complication of CA in his/family history

☞ check-up questionnaire

☞ agreement with anaesthesia

# O Room



# Monitoring

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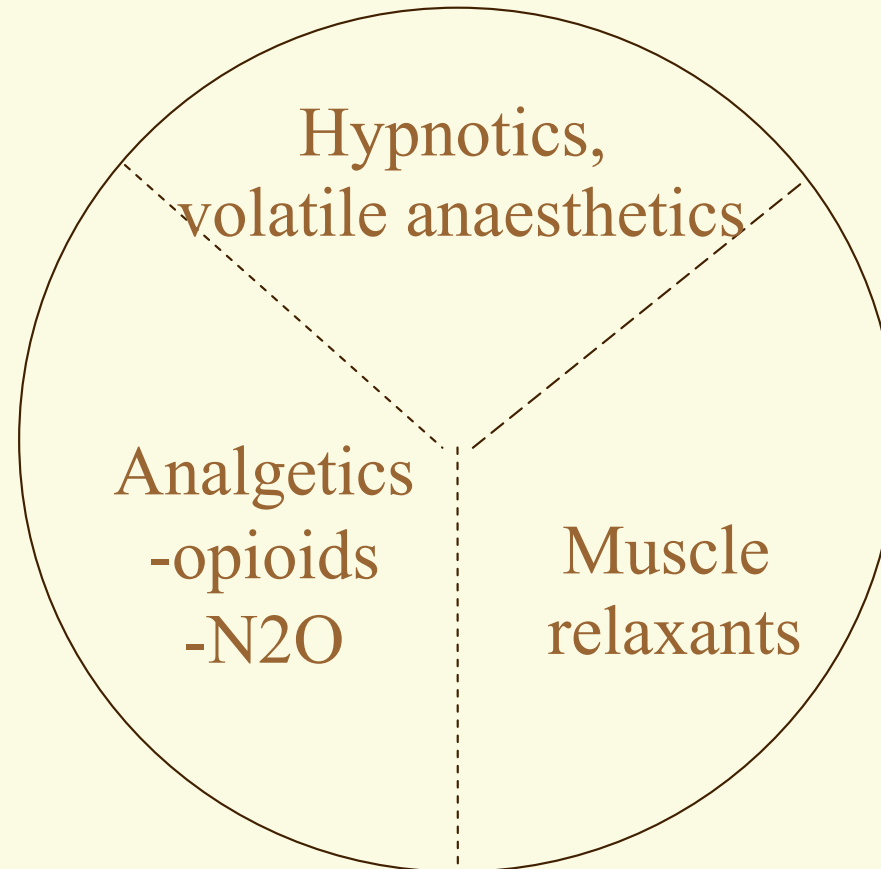
📄 basic: auscultation, NIBP, EKG- monitor, POX, Temperature

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

📄 peroperative laboratory exams

# General anaesthesia

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# Anaesthesia machine

☞ mix gases, ventilate

High pressure - central gas / cylinder

Low pressure system

☞ flowmeters

☞ vaporiser of volatile anaesthetic

☞ circuit:

- bag + tubes
- valves (one direction)
- CO<sub>2</sub> absorber

☞ ventilator (humidisator)



Department of Anesthesiology  
University of Florida  
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Deutsch

Machine Faults

Gas Color Codes

About the Developers

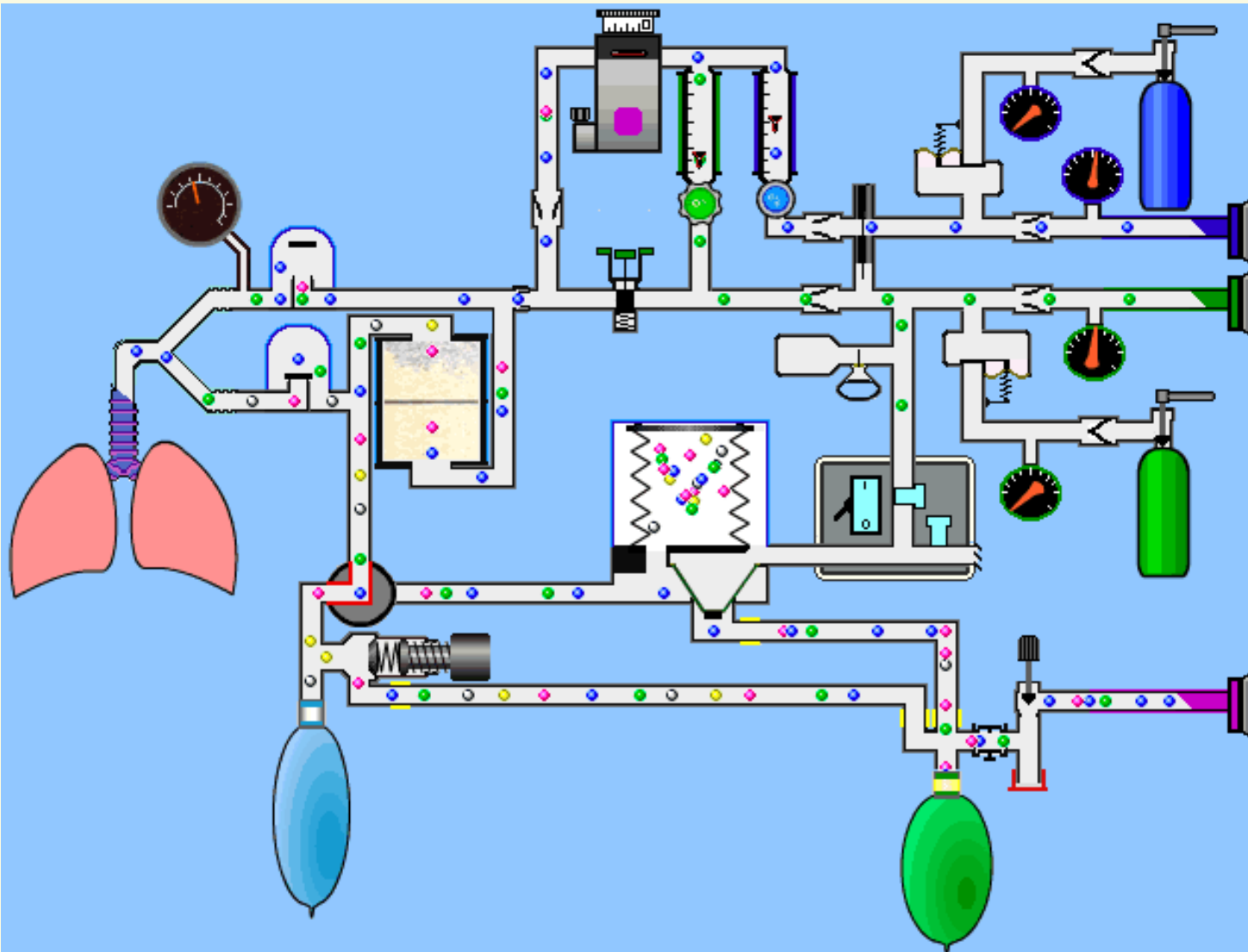
Pause Animation

Hide Gases

Reset

Help

Email Us!



Visit us at [www.anest.ufl.edu/vam](http://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 H<sub>2</sub>O ▲ ▼

(20 - 100)

Patent Pending

# Intravenous anaesthetics

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☞ **Barbiturate:** Thiopental, Metohexital

☞ **Etomidate**

☞ **Propofol**

☞ **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

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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

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

☞ Maintenance: inhalation, TIVA, add

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

# Airways

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Indication for intubation:

📄 need of relaxation or artificial ventilation

📄 full stomach

📄 Orotracheal intubation, nasotracheal intubation with direct laryngoscopy

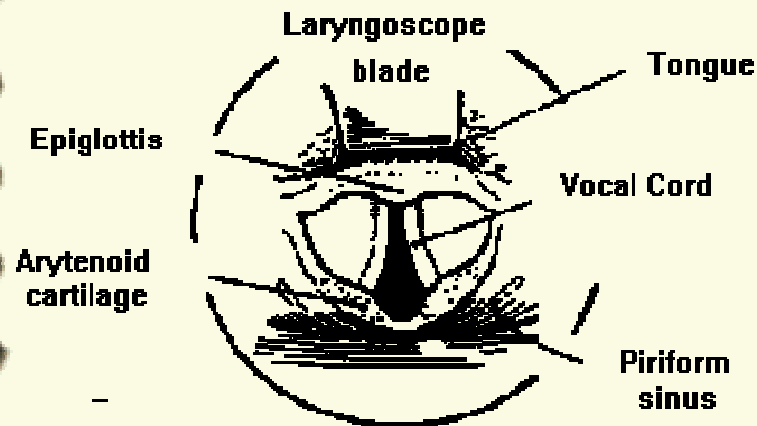
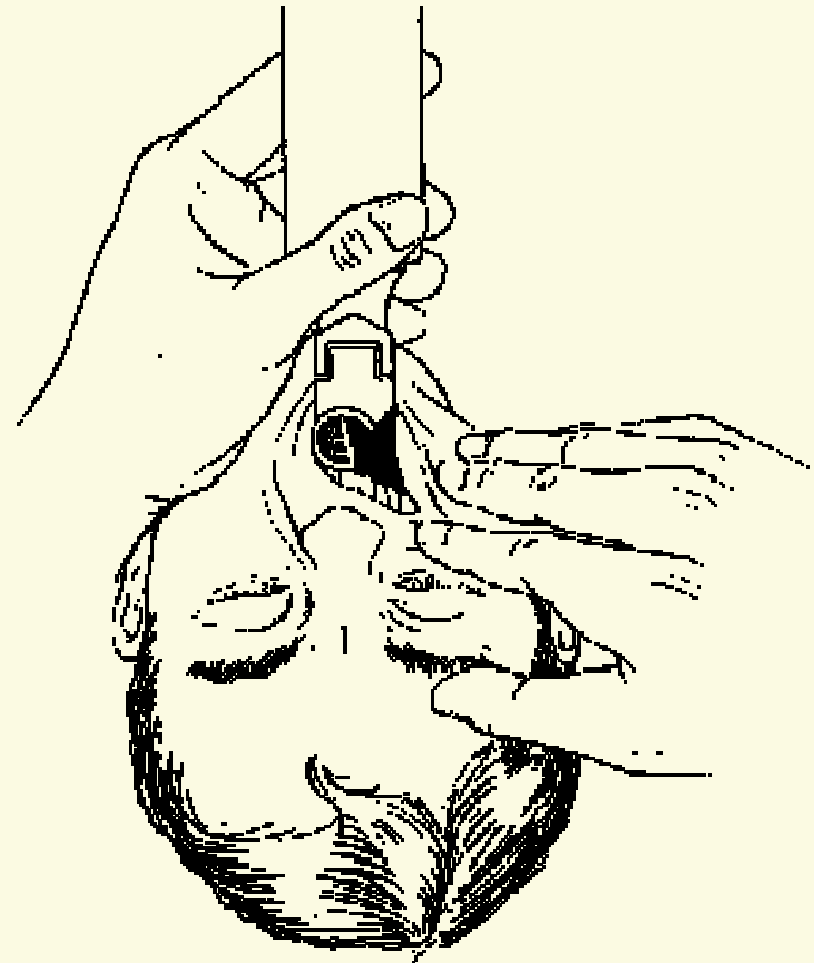
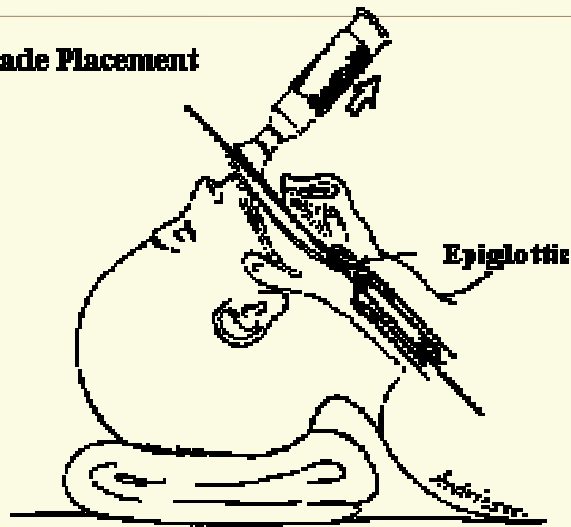
📄 Tracheotomy

📄 Laryngeal mask

📄 Cricothyrotomy

# Intubation

**Straight Blade Placement**



# Laryngeal Mask



# Infusion therapy

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 see summer semester

# Complications of GA

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!!! 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, dekomensation COPD, hepatitis, ...)

📄 malignant hyperthermia

📄 anaphylactic reaction / shock

# Mortality of anaesthesia (ASA I)

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📄 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

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- 📄 ICU or standard department
- 📄 monitoring according to type of OP + health
- 📄 control laboratory
- 📄 treatment of acute pain
- 📄 infusion therapy, blood loss