

# Anesthetics

## preanesthetics:

- Anticholinergics
- Antiemetics
- Antihistamines
- Barbiturates
- Benzodiazepines
- muscle relaxants
- opioids

## General Anaesthetics

### Inhalation

- Desflurane
- Enflurane
- Halothane
- Isoflurane
- Nitrous oxide
- Sevoflurane

### Intravenous

- Barbiturates
- Benzodiazepines
- Etomidate
- Ketamine
- opioids
- propofol

## Local anesthetic

- Bupivacaine
- lidocaine
- procaine
- Tetracaine

Definition:

- Rapid & safe Loss of consciousness. essential to serve surgical procedures.

- other objectives: analgesia

- sedation
- amnesia
- protect against side effect of surgery or other drugs.
- muscle relaxation: induction, inhibit MS tone
- suppression of undesirable.

reflexes: vomiting

- Muscle spasm
- etc.

- General anaesthetics (drugs)



Inhalation

- volatile
- halogenated hydrocarbons
- \* derived from: diethyl ether
- chloroform

\* Except = Nitrous oxide

intravenous inject.

- chemical unrelated
- induce rapid induction & skeletal Ms. relaxation.

# Anesthesia Selection

(3)

- + anesthesia that is - safe
- effective

or this depend on :-

- patient's factors - physiological = age, gender, weight etc.
- pathological factors e.g.
  - Respiratory disease
  - liver disease
  - heart disease
  - Nervous system
  - endocrine disease
  - pregnancy
  - etc.

- drugs factors : - pharmacokinetic

- pharmacodynamics

- physicochemical characteristics

- Surgical or diagnostic procedure
- Drug interactions

- onset

- duration

- Nature of procedure

# patient's organ factors

## @ liver & kidneys

### drug pharmacokinetics

- distribution
- Metabolism (clearance)
- Elimination: parent drug
- metabolites.

### drug pharmacodynamics

- toxic effects

- halo- {
  - fluoride release
  - bromide release
- hydrocarbons
- metabolites
- toxicities.

accumulation repeated anaesthesia

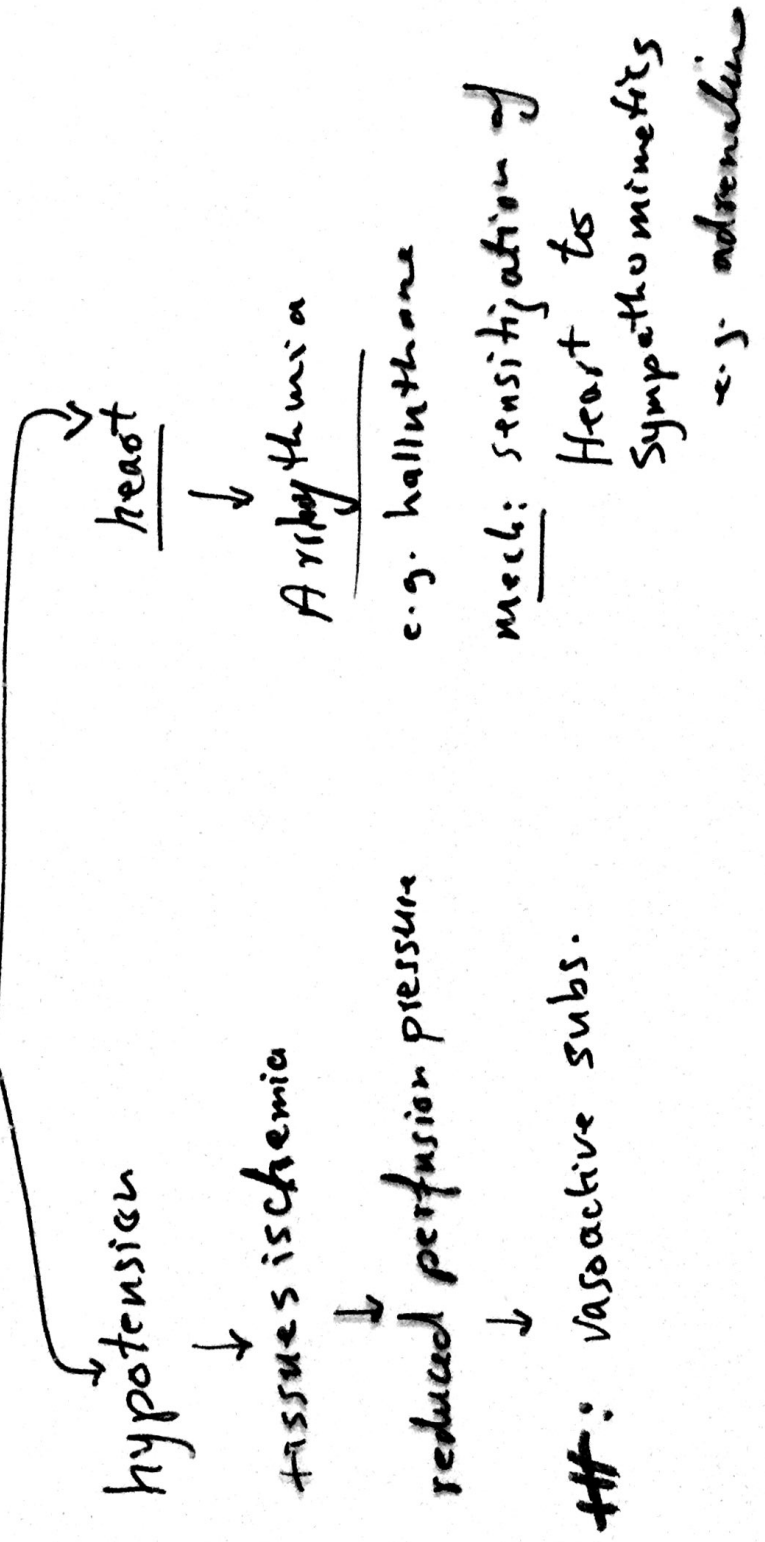
## Respiratory system

### Inhalation anaesthesia

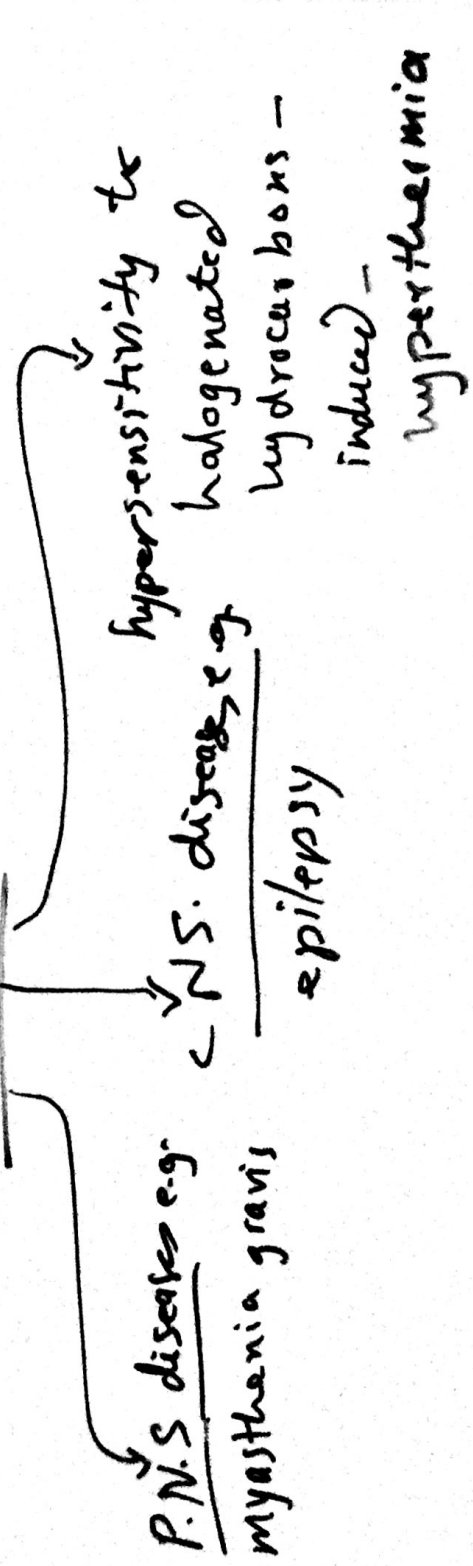
Some Respiratory diseases Complicate control

- affects
- ventilation
  - perfusion
  - R.C
- of anaesthesia: e.g. - asthma
- COPD
  - emphysema

### 3- CNS



### 4. N.S.



### 5- Pregnancy

- 1- Nitrous oxide → aplastic anaemia
- 2- benzodiazepine → oral cleft palat
- 3- during labour - benzodiazepine → hypotonia
  - heat regulating
  - count of New born.

# Concomitant drug administration

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hyporeventilation  
side effects

## adjunct drugs → smooth induction

1- Benzodiazepines → anxiolytic, sedative, amnesia

e.g. Midazolam, diazepam  
2- Barbiturates → ankylytic, sedative.

e.g. pentobarbital

3- Antihistamines → ↓ allergic reactions

e.g. diphenhydramine

4- antiemetics → ↓ aspiration pneumonia

↓ Nausea & vomiting.

e.g. ondansetron

5- opioids → analgesia

e.g. fentanyl

6- ~~anticholinergic~~ cholinergic drugs → ↓ bradycardia

↓ ↓ fluid secretion

→ bronchodilation

→ amnesia

7- Ms. Relaxants → fasciculate intubation

e.g. pancurium, doxurium, rocurium, vecuronium, cisatracurium, cisatracurium.

8- H<sub>2</sub> blockers → ↓ gastric acidity

e.g. ranitidine

## Abuse drug

- ethyl alcohol → hepatic enzyme inducer  
e.g. barbiturates

- opioids → cross tolerance?  
barbiturates?

# Stages of anaesthesia

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- ① induction =
- ② Maintenance =
- ③ Recovery

## Induction anaesthesia

Definition: the period of time from the onset of administration → up to surgical anaesthesia.

objective: to avoid the dangerous excitatory phase (Stage II delirium). that may be produced by slow onset of action some anaesthetics.

Types :- Intravenous anaesthesia - drug = thiopental

onset = 25 seconds

- skeletal muscle relaxants = fasciculate intubation and relaxation

- inhalation induction :- halothane

- sevoflurane

- used to induce general anaesthesia

## Maintenance anaesthesia

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Definition: period during which the patient is surgically anaesthetized.

Monitoring: - Vital signs  
- patient response to stimuli  $\rightarrow$  depth of anaesthesia.

Maintenance: dose of volatile anaesthetic (minute-to-minute control)

## Recovery:

- postoperative.
- anaesthesia drug withdrawal
- Monitor recovery = reverse of induction
- continues to monitor recovery until complete recovery to normal physiological functions:-
  - 1. - consciousness
  - 2. - self breathing
- observe late toxicity e.g. hepatotoxicity.



# Depth of anesthesia

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- sequential. four stages

ie = increased CNS depression.

- accumulation of anesthetic drug in CNS.

- well defined & described with ether

→ slow onset of anesthesia.

- difficult to characterize with:

• halothane

\* because of rapid onset of action

Stage I = - loss of pain sensation → spinothalamic tract

- patient conscious

- delirium, violent (maybe)

Stage II = • excitement. ↑ BP, irregular, ↑ Resp. Rate

• ++ = barbiturate = thiopental, IV,

Stage III = Surgical anesthesia:

• Respiration = regular, palat relax

• Ske. Ms. Relax. ↓ eye reflex,

pupil fixed. → proceed surgery.

Stage IV = Medullary paralysis → death.  
(RC)