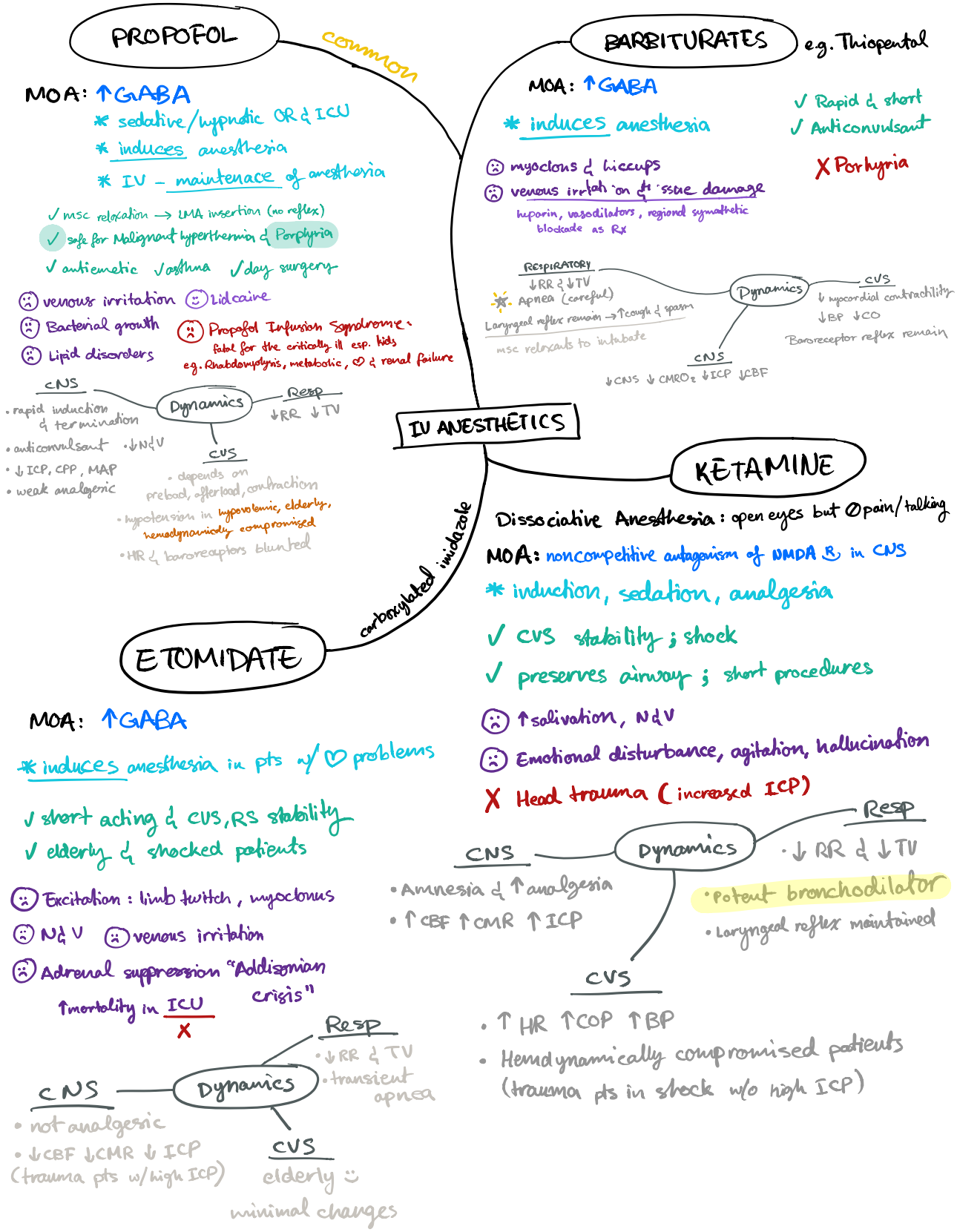

IV ANESTHETICS
PROPOFOL
common
MOA: ↑GABA
* sedative/hypnotic OR & ICU
* induces anesthesia
* IV - maintenace of anesthesia
✓ msc relaxation → LMA insertion (no reflex)
✓ safe for Malignant hyperthermia & Porphyria
✓ antiemetic ✓asthma ✓day surgery
☹ venous irritation ☺ Lidcaine
☹ Bacterial growth
☹ Lipid disorders
☹ Propofol Infusion Syndrome: fatal for the critically ill esp. kids e.g. Rhabdomyolysis, metabolic, ♡ & renal failure
CNS
• rapid induction & termination
• anticonvulsant • ↓N&V
• ↓ ICP, CPP, MAP
• weak analgesic
Dynamics
Resp
↓RR ↓TV
CVS
• depends on preload, afterload, contraction
• hypotension in hypovolemic, elderly, hemodynamically compromised
• HR & baroreceptors blunted
BARBITURATES e.g. Thiopental
MOA: ↑GABA
* induces anesthesia
☹ myoclons & hiccups
☹ venous irritation & tissue damage
heparin, vasodilators, regional sympathetic blockade as Rx
✓ Rapid & short
✓ Anticonvulsant
✗ Porhyria
RESPIRATORY
↓RR & ↓TV
Apnea (careful)
Laryngeal reflex remain → ↑cough & spasm
msc relaxants to intubate
Dynamics
CVS
↓ myocardial contractility
↓BP ↓CO
Baroreceptor reflex remain
CNS
↓CNS ↓ CMRO2 ↓ICP ↓CBF
KETAMINE
Dissociative Anesthesia: open eyes but ∅pain/talking
MOA: noncompetitive antagonism of NMDA R in CNS
* induction, sedation, analgesia
✓ CVS stability ; shock
✓ preserves airway ; short procedures
☹ ↑salivation, N&V
☹ Emotional disturbance, agitation, hallucination
✗ Head trauma (increased ICP)
CNS
• Amnesia & ↑analgesia
• ↑CBF ↑CMR ↑ICP
Dynamics
Resp
• ↓ RR & ↓ TV
• potent bronchodilator
• Laryngeal reflex maintained
CVS
• ↑ HR ↑COP ↑BP
• Hemodynamically compromised patients (trauma pts in shock w/o high ICP)
carboxylated imidazole
ETOMIDATE
MOA: ↑GABA
* induces anesthesia in pts w/ ♡ problems
✓ short acting & CVS, RS stability
✓ elderly & shocked patients
☹ Excitation: limb twitch, myoclonus
☹ N&V ☹ venous irritation
☹ Adrenal suppression "Addisonian crisis"
↑mortality in ICU
✗
CNS
• not analgesic
• ↓CBF ↓CMR ↓ ICP (trauma pts w/ high ICP)
Dynamics
Resp
• ↓RR & TV
• transient apnea
CVS
elderly ☺ minimal changes

INHALED ANASTHETICS

Pharmacokinetics

↓Blood solubility → ↑induction/recovery

Pharmacodynamics

CNS
unconciousness & amnesia
↑CBF

Resp
- Airway irritation (cough, spasm)
- Bronchodilator
- Inhibit hypoxic pulmonary vasoconstriction

Renal
↓Renal BF

CVS
- ↓myocardial & vasodilation
- HR not affected
- sensitize myocardium to effect of catecholamines

Neuromuscular
- ↓ skeletal tone
- malignant hyperthermia
  acidosis, shock

Mx: remove trigger, 100% O_2
active cooling, Dantrolene

Hepatic
↓perfusion

DESFLURANE

- Rapid onset & recovery (outpatient)
- Low toxicity

- ↑↓ special vaporizer (+) airway irritant
- ↑BP & ↑HR

COMMON

SEVOFLURANE

- Rapid induction & emergence
- pleasant smelling 🙂 kids ✓
- bronchodilator → ✓asthma, bronchitis, COPD

- Degrades in machines to Compound A (toxic)
- Not for long durations

ISOFLURANE

- Vasodilation → ↑coronary BF

- moderate solubility → delayed emergence
- sensitive to catecholamines e.g. epinephrine

CHILDREN

HALOTHANE

very soluble in blood & tissue
∴ prolonged emergence

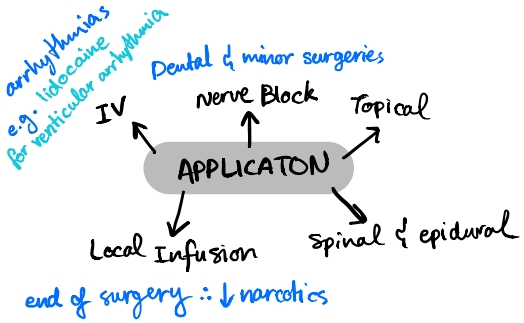
- sensitize myocardium to effect of
  ∴ arrhythmias in 50% of pts
- BP falls
- Halothane Hepatitis (rare)

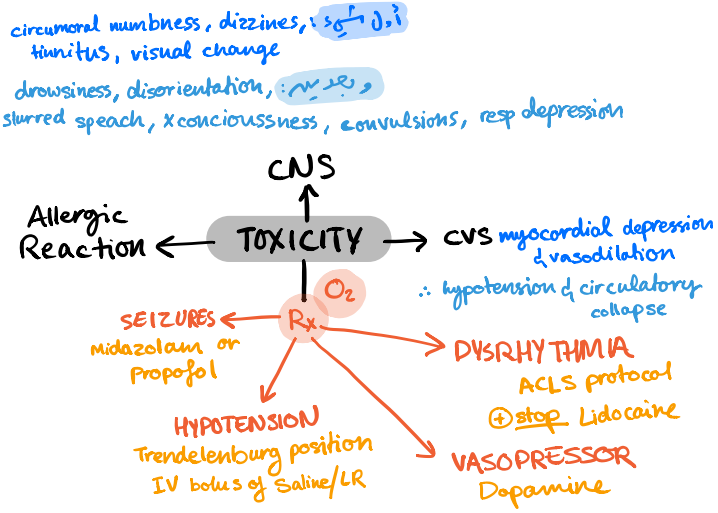
NITROUS OXIDE

LOCAL ANESTHETICS

MOA reversiby blocks Na channels

WHEN CHOOSING LA onset, duration, sensory (post-op) vs motor, toxicity





BUPIVACAINE

Onset < Lidocaine

w/ epinephrine (7hrs)

☹ cardiotoxic

✗ known sensitivity

✗ not in VEIN; next to nerve or epidural

LIDOCAINE

Rapid onset, duration 60-75 mins

extended w/ epinephrine (2hrs)

✓ antiarrhythmic effect

✗ patients w/ known sensitivity

LOCAL ANESTHETICS

RIPIVACAINE

long standing & less toxic

extensive hepatic metabolism w/ only 1% of drug eliminated unchanged in urine

So, OPIOIDS bind with μ (mu), κ (kappa), δ (delta)] PRIMARY USES
1. mimic endorphins, dynorphins, & enkephalins
2. Analgesia ↓ pain, sedation
3. ↑ Dose → GA

✓ minimal ♡ effect
But ☹ miosis - N & V - constipation — Respiratory depression (apnea) — chest wall rigidity
bradycardia — vasodilation & histamine → hypotension — itching — urinary retention & biliary colic

Rimefentanil (Ultiva)

most potent

- ↓ short acting & clearing

✓ Excellent ♡ stability

Fentanyl

X100 more potent > morphine

* induction & maintenance of GA
* supplements regional & spinal anesthesia

✓ maintains ♡ stability

Morphine

☹ hypotension, bronchoconstriction (histamine)

NOT for asthma, renal failure

OPIODS

Sufentanil Citrate (Sufena)

- 10x as potent as fentanyl
- rapidly eliminated from body
- recovery faster > fentanyl

NALOXONE

opiate R Antagonist!

Alfentanil

shorter duration of action
more potent

Adverse Effects:
- N & V
- ↑ sympathetic nervous system

(tachycardia, hypertension, pulmo edema)

may lead to

CARDIAC FAILURE

NEUROMUSCULAR BLOCKERS

Depolarizing

onset 60s | duration 10mins

(Suxamethonium) Succinylcholine: activate Ach R
(persistent partial depolarization w/o repolarization)

- Metabolized by: Plasma cholinestrase (pseudocholinestrase)
- Potentiated by: AChE inhibitors → Reverse NM blockade of non-depolarizing drugs

✓ Rapid Sequence Induction (short time intubation) (full stomach patients)

- dysrhythmias
- myalgia
- Hyperkalemia ⊘ burns, renal failure, paraplegia, muscular dystrophies ⊘
- Histamine
- ↑ intraocular, intracranial, intragastric Pressure
- dual block ↓ anaphylaxis
- malignant hyperthermia
- apnea ✓ analgesics & sedatives

Nondepolarizing

⊘ Ach to R → inhibit msc contraction

Mivacarium

hydrolized by plasma cholinestrase

☹ histamine release → hypotension, tachycardia

Cisatracurium

- No histamine release
- Hoffman degradation

✓ ↓ laudanosine production

Atracurium

metabolized by Hofmann degradation + ester hydrolysis

✓ Hepatic & Renal failure

☹ Laudanosine (سُمّ) → accumulation → seizures

Rocuronium

when ↑ dose → ↓ time for Rapid Sequence Induction

في الحالات اللي Suxamethonium ما ينفعش فيها

☹ Anaphylactic ☹

#REMEMBER

- Suxamethonium → CS, full stomach; ☆ → Rapid intubation
- Rocuronium → ↓ hyperkalemia in burns
- Pancuronium → vagolytic in pediatrics; → ☹ tachycardia in IHD

To REVERSE effect:

(Suxamethonium) → reverses non-depolarizing drugs

b/c it activate Ach R while non-depolarizing drugs Ø Ach R

☆ ≥ 3 twitches on train of four before reversal

BENZODIAZEPINES			
GABA	sedation amnesia anxiolytic -premed OR -adjunct	CNS: anticonvulsant CVS: mild vasodilation ↓CO Resp: ↓RR & ↓TV ⊕opioid = resp depression	☹ Pregnancy & labor: - 1st trimester: cleft lip & palate - Delivery: CNS depression Diazepam reduced clearance ↑ ☹ Respiratory depression esp. elderly → Apnea

Midazolam (Dormicum) — Drug of Choice

- Rapid onset & elimination
- ☆ potent amnestic ✓ OR use
- No pain during injection بخلاف! → Diazepam (valium) long acting, but! ☹ pain & irritation
- Lorezepam (ativan) used as premedication (long acting) but! → (pain)

Flumazenil — Antagonist

- Reverses sedative effect within 2 mins
- X Not for pts taking Benzos for < seizures; ↑ICP

Jarrah Mendoza