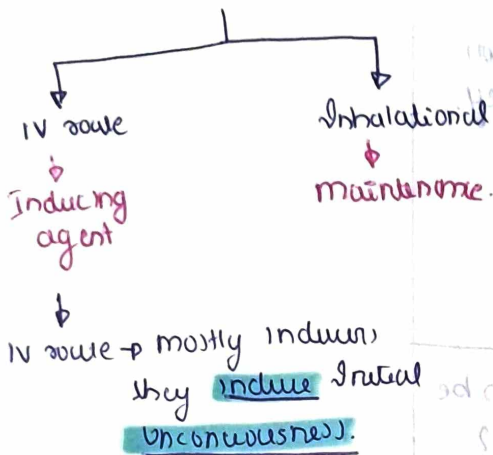


General Anaesthetic Agents

General Anaesthetics.



• but they are short acting.
 • So for maintenance we use Inhalational route.

Intravenous Agents (Inducers)

1. Thiopentone (barbiturate)
2. Etomidate
3. Propofol
4. Ketamine

Thiopentone

- It is a barbiturate.
- * It is highly soluble (highly lipid soluble)
- Kovik when given IV, along with blood, it will reach brain.
- since highly lipid soluble, it immediately diffuses out into brain tissue.

↓
 then to neurons.
 ↓
 since it is a barbiturate, it will open GABA-chloride channel

↓
depresses brain

ie, the patient becomes unconscious quickly.
 ↓
 within seconds

very fast acting*

REDISTRIBUTION

- Since it is highly lipid soluble, it comes out of neuron, back into blood vessel too.
- then it is carried to less vascular organs like adipose tissue, skeletal muscle etc.

• even though, the on of action is very quick,

↓
 it quickly stops working too.

↓
 but is due to REDISTRIBUTION

• not excretion or metabolism.

accidental intraarterial injection of thiopentone

↓
 • In case of accidental intra arterial injection

↓
DO NOT REMOVE NEEDLE*

• symptom
 ↓
extreme pain
 • coagulation, obstruction can occur.

• through some needle we need to give anticoagulants, fluids etc.
 • if we remove needle, we might not be able to find some artery again.

ETOMIDATE

★ CVS stable. ★

- most of the anaesthetics depress CV too.
- but Etomidate doesn't depress heart so,

DOC

IV anaesthetic of choice for CV surgeries
eg: aneurysm sx.

but, major drawback

→ causes Adrenal Suppression

- Inhibits formation of corticosteroids.

PROPOFOL

day care surgery

* Painful →

★ most painful anaesthetic IV.

★ CI - egg allergy X
so avoided in egg allergy patient

★ m/c drug used in

★ ① Day Care Surgery

② total IV anaesthesia.

there is induction + maintenance by IV alone & no intubation is there.

• day care → to send patient home on same day.
ie, drug wears out in same day.

day care sx ⇒ there is no admitting in hospital.

- we are sending patient home on same day.
- so the anaesthetic should wear off same day.
- propofol action wears off in same day its self.
- so we prefer propofol in day care surgery.

• what other drugs can be used in day care sx?

- Dr - Desflurane
- Mantohan - Midazolam
- Singh - Sevoflurane
- Is - Isoflurane
- A - Alfentanil
- Prime - Propofol
- minutes - mivacurium

can be given in full stomach.

★ CI in facial injury, glaucoma.

KETAMINE

★ ★ ★ ★

MCI

K - Kids - (DOC in children)

E - Emergent reaction.

T - Thalamo cortical jct site (Dissociative anaesthesia)

A - Analgesia (max)

M - Meats - can be given in full stomach.

I - Increases all pressure

N - NMDA receptor blocker.

E - Excellent bronchodilator.

usually, they are not to eat to prevent aspiration. normally, pharyngeal reflex closes glottis, but anaesthetic ⊖ pharyngeal reflex - glottis is open.

CNS
→ side effect when person is waking up from anaesthesia
→ hallucination, delirium.

preferred in shock.

(bp) intracocular, intracardiac, intracranial (coronary, glaucoma).

• Ketamine doesn't ⊖ pharyngeal reflex... so we can give even after just eating. - used in emergency sx.

Inhalational Agents

(maintenance)

Ether
Chloroform
cyclopropane
Triflure

used early...
but they are
Inflammable

- when there is any ruptured blood vessel... we stop bleeding by **Cautery**.
- Since they are Inflammable... Cautery can't be used.
- Surgery will be prolonged and also blood loss will be more if we are doing it manually.

So, Now... we don't use any Inflammable ones.

Non-Inflammable

- Halothane ✓
- Enflurane ✓
- Isoflurane ✓
- Sevoflurane ✓
- Desflurane ✓
- Methoxyflurane ✓
- Xenon ✓
- N₂O ✓

① MAC (min. alveolar concentration)

- minimum concentration in alveoli that is required to make person unconscious.

{ Inhalation → MAC
IV → Dose }

MAC ∝ $\frac{1}{\text{potency}}$

[highest] → N₂O = 104% - **best potent anaesthetic**
Xenon = 70%

[lowest] Methoxyflurane → **most potent (not used now)**
Halothane

most potent that is used now:

Blood Solubility

- if blood soluble is more
↓
It will try to stay in blood.
↓
won't go to brain.

∴ more blood soluble
↓
Slower acting

Blood solubility ∝ $\frac{1}{\text{speed of action}}$

Blood gas partition coefficient

↓ parameters that fall about blood solubility

Blood gas partition coefficient ⇒ Blood solubility

↓ max {slowest acting} ↓ min. {fastest}

↓ Methoxyflurane ↓ Xenon ⇒ Desflurane

N₂O : highest MAC (104%)

we need O₂ to breathe dude... so we can't give over 100% N₂O...
How far can we use 104%
like the max we can use is 70%.

∴ it is **not a complete anaesthetic agent**

• It is an **add-on**. we use it cause of it,

- * Analgesic ✓
- * MR property ✓

Halothane

One of the most potent.
(after methoxyflurane)

H - Heart
A - Adrenaline
L - Liver toxic (hepatitis on suspected we.)
O } Tocolytic (suprus).
T }
H } causes contraction.
A } causes relaxation.
N } malignant hypertension.
E

arrhythmogenic action.
makes heart sensitive to adrenaline.
so, we don't give it in pheochromocytoma surgery.

used in internal version of baby is baby is in long horizontal lie
* but should be avoided in labour as we need to contract uterus.
after it releases, we can rotate baby.

Seizures

caused by →

S - Sevoflurane
E - Enflurane - ~~max~~ avoided in epileptic patients.
I - Isoflurane

Sevoflurane

preferred inhalational anaesthetic in

→ ~~room~~ children
→ CVS & Neurosurgery
{ Isoflurane can be also used in CVS & Neurosurgery }

Desflurane

• Maximum respiratory stimulation

Methoxyflurane

→ most potent
→ slowest acting.
→ Nephrotoxic { high fluency }

Not preferred ★

Xenon

* Considered as ideal Anaesthetic Agent.

- (a) Anaesthetic (~70%)
- (b) Analgesic good. muscle relaxant ✓
- (c) fastest acting.
- (d) smooth induction {no bradycardia}
- (e) safe - No/ste on Heart, kidney, Liver.

But we don't use it y?

Not readily available!

rare gas
we can't make xenon by any reactions...

It's costly.

DOC

IV - Ketamine
Inh - sevoflurane.

Desflurane

- maximum respiratory stimulation

Methoxyflurane

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Colour coding - cylinders

N₂O - Nickel Blue.

O₂ - Black & white



cyclopropane - orange {scarcely}

Entonox - 50% N₂O + 50% O₂.



Barbiturate

Barb

• works just like GABA. they bind to Barb receptors & open Cl⁻ channel.

• GABA mimetic.

↑ duration of channel opening

• DRC - steep i.e., unsafe