



Concept Map: Inhaled Anesthetics

The Ideal Agent (SPIN SAFE)

S Stable
P Potent
I Inexpensive
N Non-pungent
S Safe
A Anemia-proof
F Fast emergence
E



Chemical Families & Structure

Halogenated Ethers
Isoflurane
Sevoflurane
Inorganic Gases
N₂O Xenon N₂O

Speed of induction & Solubility

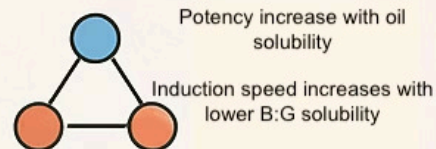
Blood Gas partition
coeff = Faster on/off

Cardiac output
= slower induction

Inhaled Anesthetics

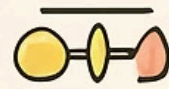
Produces amnesia, hypnosis,
analgesia, and immobility via
CNS depression

Core Exam Links



Potency and MAC

Potency directly proportional with oil
solubility (but inversely proportional to
MAC)



Highlights



Lower blood gas solubility = Faster
induction

Agent Profiles (HIP DES Se X)

Highlights

N₂O



N₂O
Analgesic
Expands
B12 inactivation



Isoflurane
Stable
Cheap
Coronary Steal



Desflurane
Fast on/off



Sevoflurane
Compound A
Nephrotoxic F



Xenon
NMDA antagonist
neuroprotective

Highlights



1. The Ideal Agent (SPIN SAFE)



Mnemonic: **SPIN SAFE** → **S**table **P**otent **I**ncexpensive **N**on-pungent **S**afe **A**nemia-proof **F**ast emergence **E**co-friendly

☐ **Key NCE Reminder:** No one gas fully meet all criteria → compare real agents vs ideal.



Chemical Families & Structure

Halogenated Ethers

Isoflurane • Desflurane •
Sevoflurane (ether link O–)

Halogenated Alkane

Halothane (C–H chain)

Inorganic Gases

N₂O and Xenon

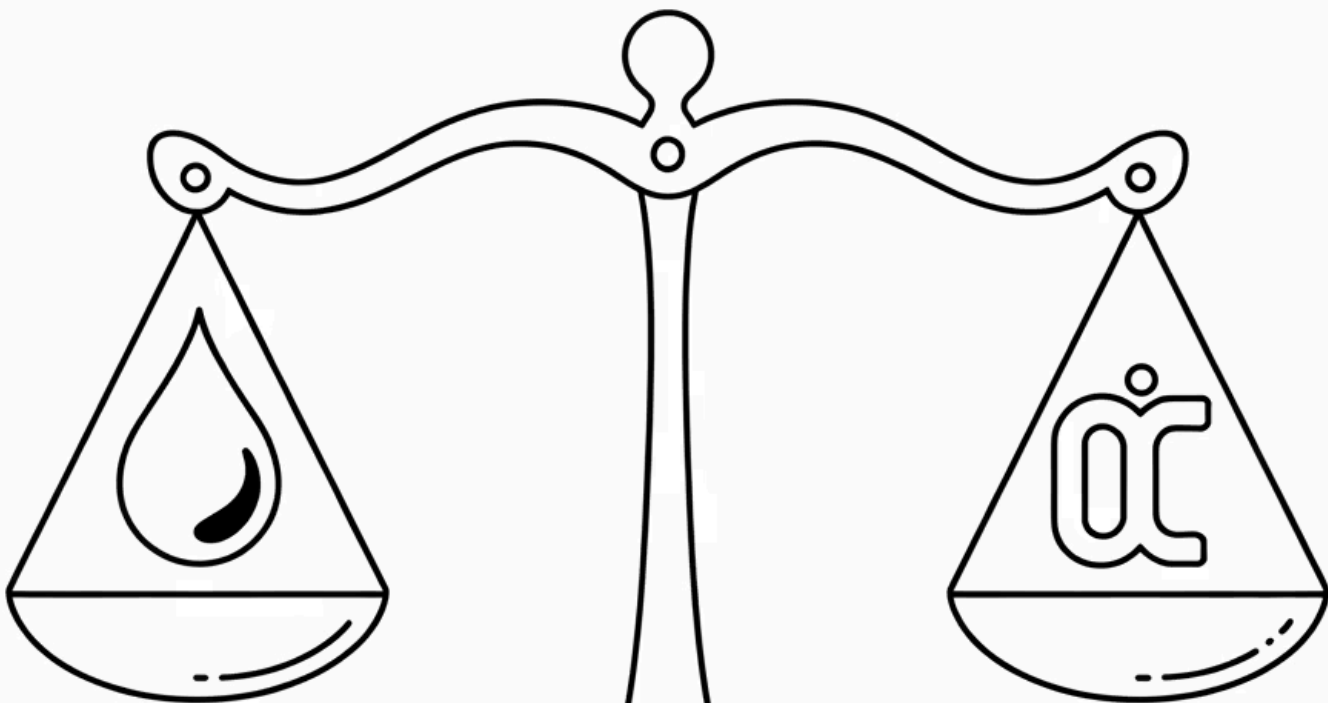
F (Fluorine) = stability ↑ flammability ↓

Mini-Mnemonic: 🚑 **"Ethers Ease Entry"** → smooth induction vs Halothane "heavier hand."



Potency and MAC ('High Oil = High Power')

Potency \propto Oil:Gas solubility



Oil Solubility \uparrow vs "MAC \downarrow "

Mnemonic: "High Oil = High Power \rightarrow Low MAC."

Exam Table call-outs:

Agent	MAC (%)	Relative Potency
Halothane	0.75	High
Isoflurane	1.2	Moderate
Sevo	1.8	Lower
Des	6.6	Low
N ₂ O	104	Weak

▶▶ 4. Speed of Induction & Solubility

Key Relationship: Blood:Gas Partition Coeff ↓ → Faster on/off.

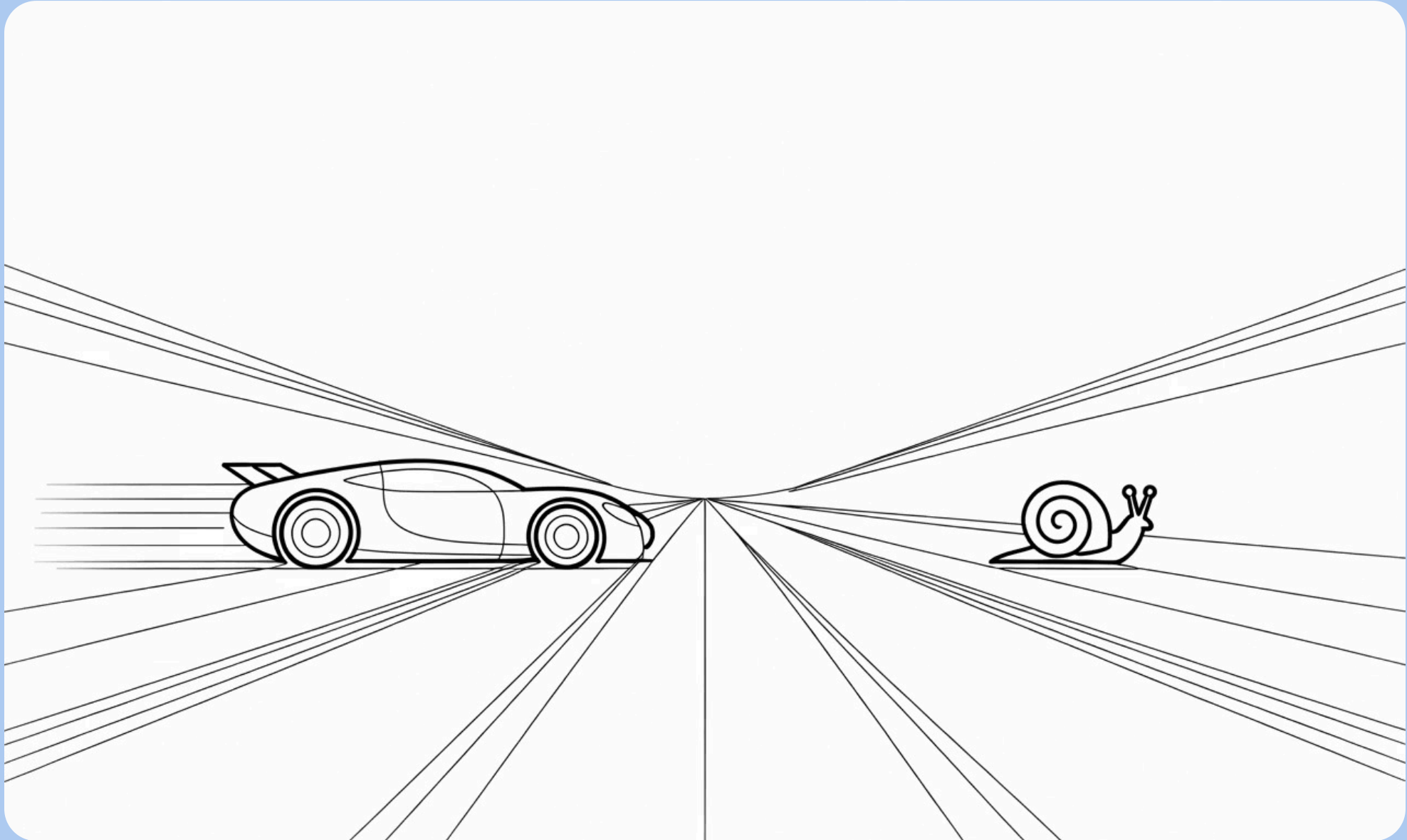


Illustration: Racing track — Desflurane (🏁) beats Sevo > Iso > Halothane (snail).

Mnemonic: "Low Solubility = Fast In & Fast Out."

📌 **Board Pearl:** ↑ Cardiac Output = Slower induction (especially in highly soluble agents).



Agent Profiles (HIP DES SeX)

Mnemonic: "HIP DES SeX" = Halothane, Iso, Propane (like Des), Des, Sevo, Xenon

Agent	Highlights
N ₂ O	Analgesic, expands closed spaces, B12 inactivation
Halothane	Cardiac depression, arrhythmias, hepatitis, MH trigger
Isoflurane	Stable, cheap, coronary steal
Desflurane	Fastest on/off, pungent, tachycardia
Sevoflurane	Smooth induction, Compound A, nephrotoxic fluoride
Xenon	NMDA antagonist, neuroprotective, expensive



Core Exam Links

Three Relationships to Master:

1

Potency ↔ MAC ↔ Oil Solubility

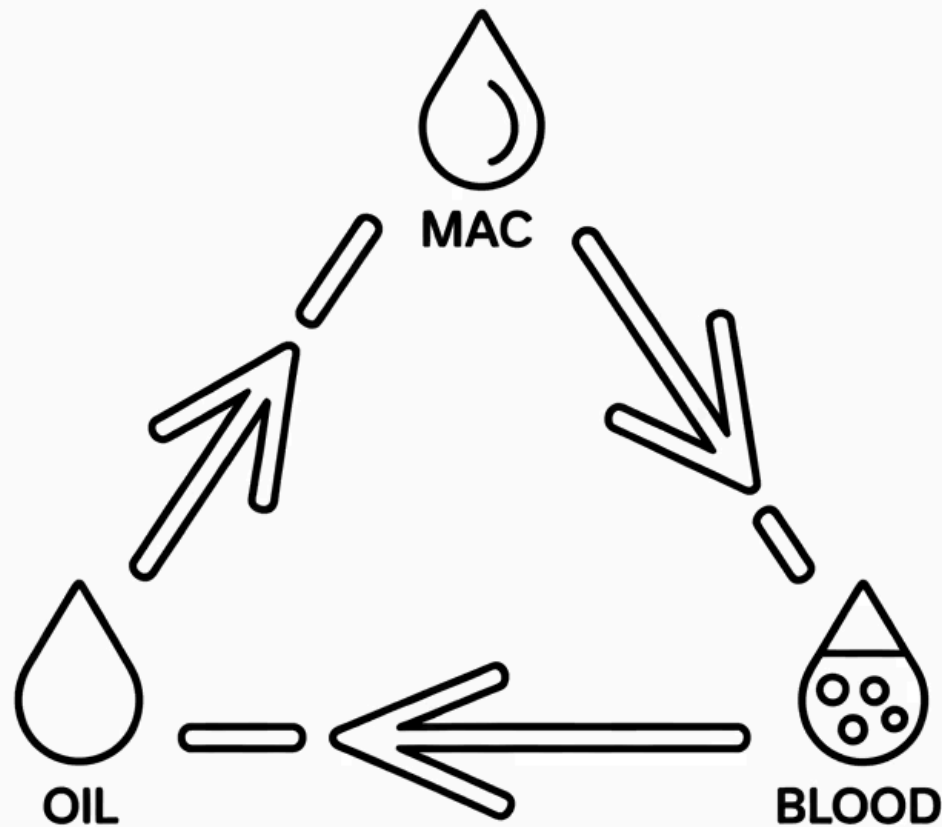
2

Induction Speed ↔ Blood Solubility

3

Adverse Effects ↔ Chemical Class

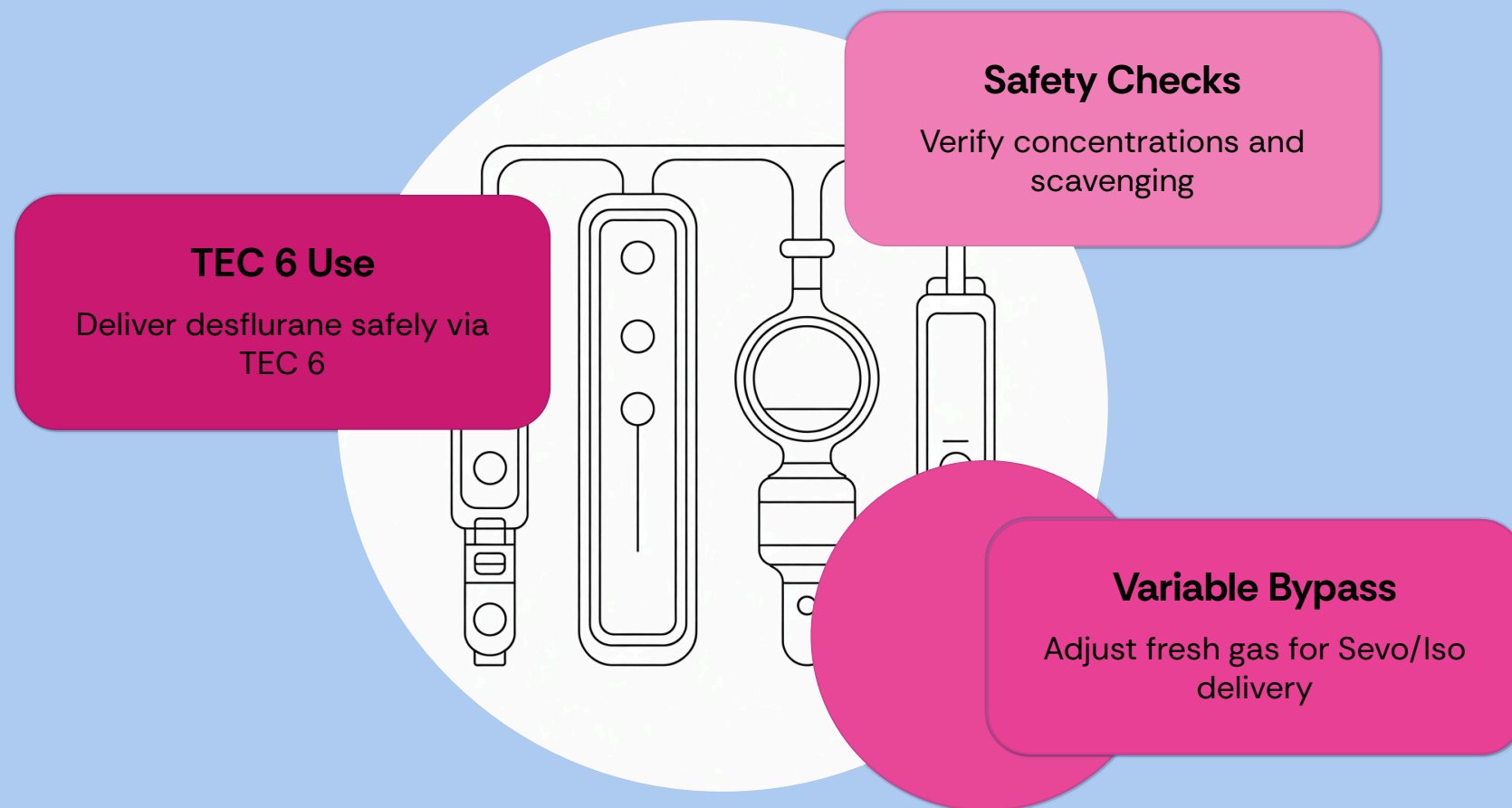
Quick Memory Hook: 🧩 "MAC OIL BLOOD CLASS = Exam PASS."



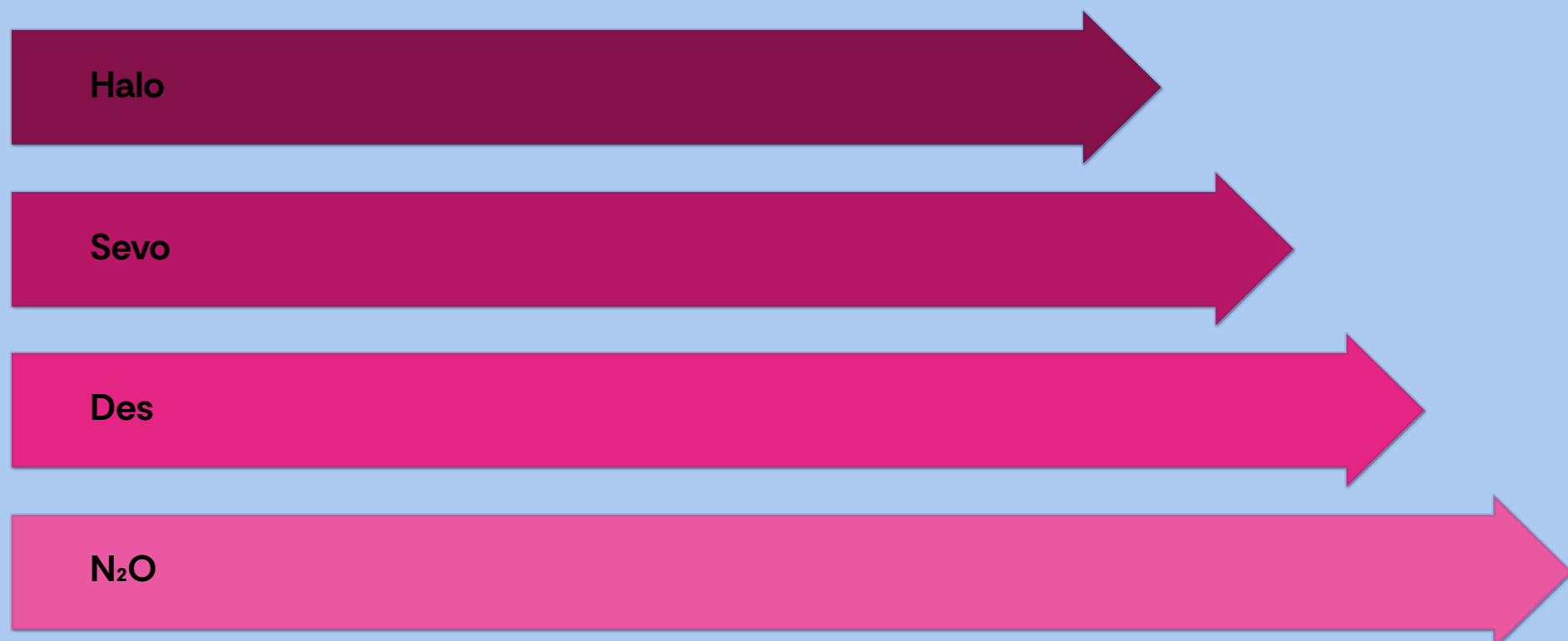


Optional

- **Vaporizer Types:** TEC 6 for Des, variable-bypass for Sevo/Iso.



- **Environmental Impact:** CO₂-footprint



- **Safety Note:** All except N₂O can trigger MH