

Volatile anesthetic: potency

No long write-up this week, I don't know what the ABA expects you to know other than this: inhaled anesthetic potency correlates quite well with the lipid solubility of the agent. Specifically we look at the oil:gas partition coefficient. Remember the blood:gas coefficient as it relates to inhaled anesthetic agent uptake? Similar concept but it is important to keep in mind that these two coefficients are not the same. Although there seems to be a weak similarity between blood:gas coefficient, **the ABA expects you to know that potency tracks closely with the oil:gas coefficient.**

Inhalation anesthetic agents

Generic name	Nitrous oxide	Halothane	Isoflurane	Sevoflurane	Desflurane
Brand name	N/A	Fluothane	Forane	Ultane	Suprane
Chemical formula	N ₂ O	C ₂ HBrClF ₃	C ₃ H ₂ ClF ₅ O	C ₄ H ₃ F ₇ O	C ₃ H ₂ F ₆ O
Odor	Slightly sweet	Sweet	Sweet	Sweet	Sweet
Color	Colorless	Colorless	Colorless	Colorless	Colorless
Pungency	None	Moderate	High	Low	Very high
Solubility:blood:gas partition coefficient	Very low: 0.46	Very high: 2.40	Moderately high: 1.40	Low: 0.65	Very low: 0.45
Redistribution:brain:blood partition coefficient	1.1	1.9	1.6	1.7	1.3
Potency:oil:gas partition coefficient	Very low: 1.4	Very high: 224.0	High: 97.0	Moderately high: 42.0	Low: 18.7
Minimum alveolar concentration (MAC) = ED₅₀ for response to surgery	105.0%	0.8%	1.2%	2.0%	6.0%
MAC-awake/MAC-aware = ED₅₀ for response to voice/touch	68.0%	0.4%	0.5%	0.6%	2.5%
Blood pressure effect	Negligible	Dose-dependent hypotension	Dose-dependent hypotension	Dose-dependent hypotension	Dose-dependent hypotension
Vascular effect	Negligible	Negligible	Vasodilation	Vasodilation	Initial vasoconstriction, later vasodilation
Inotropic effect	Negligible	Negative	Slightly negative	Slightly negative	Initial positive, later negative
Chronotropic effect	Negligible	Bradycardia	Tachycardia	Tachycardia > 1 MAC	Tachycardia
How supplied	Pressurized bottled gas	Bottled liquid	Bottled liquid	Bottled liquid	Bottled liquid
How delivered	Flowmeter	Vaporizer	Vaporizer	Vaporizer	Electric heated vaporizer
Fire risk	Supports combustion	Non-flammable	Non-flammable	Non-flammable	Non-flammable
Notes	Nausea/emesis	Nausea/emesis; bradycardia/asystole; inhalational induction; no longer used in US	Nausea/emesis; potentially significant tachycardia	Nausea/emesis; inhalational induction	Nausea/emesis; airway irritation; initial sympathomimetic

N/A: not applicable.