

Introduction to Anaesthetic Drugs

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Designed as a quick-reference guide for students and health-care professionals.

1. What Is an Anaesthetic?

Aspect	Definition
Purpose	To induce a reversible loss of sensation (pain, temperature, pressure) and, when required, loss of consciousness.
Types of effects	• Analgesia – pain relief • Amnesia – loss of memory of the event • Muscle relaxation – facilitates surgery • Unconsciousness – general anaesthesia
Routes of administration	Inhalational (gas/vapour), intravenous (IV), intramuscular (IM), oral, topical, epidural/spinal.

2. Classification of Anaesthetic Drugs

Class	Main agents	Typical clinical use	Key pharmacologic features
Inhalational (volatile) agents	Sevoflurane, Desflurane, Isoflurane, Halothane (rare)	Maintenance of general anaesthesia (GA)	Low blood:gas partition coefficient → rapid induction/recovery; dose-dependent respiratory depression; minimal metabolism (except halothane).

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Intravenous induction agents	Propofol, Etomidate, Thiopental, Ketamine	Induction of GA; sedation; procedural anaesthesia	• Propofol – rapid onset, anti-emetic, dose-dependent hypotension. • Etomidate – hemodynamically stable, adrenal suppression. • Thiopental – barbiturate, long-acting. • Ketamine – dissociative, stimulates sympathetic tone, preserves airway reflexes.
Opioid analgesics	Fentanyl, Sufentanil, Remifentanyl, Morphine, Hydromorphone	Intra-operative analgesia; postoperative pain control	Potent μ -receptor agonists; respiratory depression; remifentanyl unique for rapid metabolism by plasma esterases.
Neuromuscular blocking agents (NMBAs)	Depolarizing: Succinylcholine Non-depolarizing: Rocuronium, Vecuronium, Atracurium, Cisatracurium	Facilitate tracheal intubation & muscle relaxation	Succinylcholine – rapid onset, short duration, contraindicated in hyperkalemia. Non-depolarizers – longer acting, reversed with anticholinesterases (neostigmine) or sugammadex (rocuronium, vecuronium).
Adjuncts & adjuvants	Midazolam, Dexmedetomidine, Lidocaine, Magnesium, Anticholinergics (glycopyrrolate, atropine)	Sedation, anxiolysis, blunting of sympathetic response, reduction of anesthetic dose	Benzodiazepines ? amnesia, anxiolysis; Dexmedetomidine ? sedation with minimal respiratory depression; Lidocaine ? IV analgesia, reduces cough on emergence.
Local anaesthetics	Lidocaine, Bupivacaine, Ropivacaine, Mepivacaine	Regional blocks, infiltration, epidural/spinal anaesthesia	Block Na^+ channels ? prevent depolarization. Duration & potency depend on lipid solubility and protein binding.

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3. Pharmacokinetic Principles Relevant to Anaesthetics

Parameter	Description	Clinical implication
Onset of action	Determined by drug's lipid solubility, pKa, and route	Faster onset ? easier airway