Drug used in operation room and for pt on mechanical ventilator

anesthetic is a drug that causes anesthesia—reversible loss of sensation. They contrast with analgesics (painkillers), which relieve pain without eliminating sensation. These drugs are generally administered to facilitate surgery.

Anesthetics are categorized into two classes:

general anesthetics, which cause a reversible loss of consciousness, and

local anesthetics, which cause a reversible loss of sensation for a limited region of the body while maintaining consciousness.

Combinations of anesthetics are sometimes used

Local anesthetics

Each of the local anesthetics have the suffix "-caine" in their names.

- cocaine
- lidocaine (also known as Lignocaine)

Local anesthetics are agents that prevent transmission of nerve impulses without causing unconsciousness. They act by binding to fast sodium channels .

General anesthetics

Inhaled agents

- Desflurane
- Isoflurane
- Sevoflurane
- Xenon (rarely used)

any inhaled anesthetic agent can be used for induction of general anesthesia. However, most of the anesthetics are irritating to the airway, perhaps leading to coughing, laryngospasm

Intravenous agents (non-opioid)

While there are many drugs that can be used intravenously to produce anesthesia or sedation, the most common are:

- Barbiturates
  - Methohexital (trade name: Brevital)
  - Thiamylal (trade name: Surital)
  - Thiopental (trade name: Penthothal
- Benzodiazepines
  - Diazepam
  - Lorazepam
  - Midazolam
- Ketamine
- Propofol

Benzodiazepines can be used for sedation before or after surgery and can be used to induce and maintain general anesthesia. When benzodiazepines are used to induce general anesthesia, midazolam is preferred. Benzodiazepines are also used for sedation during procedures that do not require general anesthesia. benzodiazepines have no pain-relieving properties. Propofol is one of the most commonly used intravenous drugs employed to induce and maintain general anesthesia. It can also be used for sedation during procedures or in the ICU. Like the other agents mentioned above, it renders patients

Drug used in operation room and for pt on mechanical ventilator

unconscious without producing pain relief, ketamine produces profound pain relief, even in doses lower than those that induce general anesthesia. Also unlike the other anesthetic agents in this section.

Intravenous opioid analgesic agents

While opioids can produce unconsciousness, they do so unreliably and with significant side effects. So, while they are rarely used to induce anesthesia, they are frequently used along with other agents such as intravenous non-opioid anesthetics or inhalational anesthetics, Furthermore, they are used to relieve pain of patients before, during, or after surgery. The following opioids have short onset and duration of action and are frequently used during general anesthesia:

- Fentanyl
- Remifentanil

The following agents have longer onset and duration of action and are frequently used for post-operative pain relief:

- Meperidine, also called **pethidine**
- Morphine

Muscle relaxants

Muscle relaxants do not render patients unconscious or relieve pain. Instead, they are sometimes used after a patient is rendered unconscious (induction of anesthesia) to facilitate intubation or surgery by paralyzing skeletal muscle.

- Intermediate acting
  - Atracurium
  - Cisatracurium
- Long acting
  - Pancuronium

Intravenous reversal agents

- Flumazenil, reverses the effects of benzodiazepines
- Naloxone, reverses the effects of opioids
  - Neostigmine, helps reverse the effects of non-depolarizing muscle relaxants

Scientific name:- midazolam hydrochloride

Trade name midazolam

Drug classes

Benzodiazepine (short-acting)

CNS depressant

Therapeutic actions

Exact mechanisms of action not understood; acts mainly at the limbic system and reticular Formation; anxiolytic and amnesia effects occur at doses below those needed to cause sedation

Indications

● IV or IM: Sedation, anxiolysis, and amnesia prior to diagnostic, therapeutic, or endoscopic procedures or surgery

● Induction of general anesthesia

● Continuous sedation of intubated and mechanically ventilated patients as a component of anesthesia or during treatment in the critical care setting

● Unlabeled uses: Treatment of epileptic seizure or refractory status epilepticus

Dosages

q ***Black box warning*** Midazolam should only be administered by a person trained in general anesthesia and with equipment for maintaining airway and resuscitation on hand; respiratory depression and respiratory arrest can occur. Administer IV with continuous monitoring of respiratory and CV function. Individualize dosage; use lower dosage in the elderly patients. Adjust dosage according to use of other premedication.

▼IV FACTS

Preparation: Do not mix with other solutions; do not mix in plastic bags or tubing; may be used undiluted or diluted in D5W, 0.9% normal saline, or lactated Ringer's.

Infusion: Inject slowly into large vein over 2 min, monitoring patient response.

Contraindications:

- hypersensitivity to midazolam or other benzodiazepines

depressed vital signs

Adverse effects

● **CNS:** Transient and mild drowsiness (initially), sedation, light-headedness, disorientation, restlessness, confusion, delirium, difficulty in concentration

● **CV:** CV collapse, hypotension

● **Dependence:** Drug dependence with withdrawal syndrome when drug is discontinued (more common with abrupt discontinuation of higher dosage used for longer than 4 mo)

● **Other:** Phlebitis and thrombosis at IV injection sites, and redness after IM injection

Interactions

Drug-drug ● Risk of increased CNS depression if combined with alcohol, antihistamines, opioids, other sedatives, decrease midazolam dose if any of these combinations are used

■ **Nursing considerations**

Assessment

≠***Warning*** Do not administer intra-arterially, which may produce arteriospasm or gangrene.

● Do not use small veins (dorsum of hand or wrist) for IV injection.

● Administer IM injections deep into muscle.

● Monitor IV injection site for extravasation.

● Monitor level of consciousness before, during, and for at least 2–6 hr after administration of midazolam.

● Carefully monitor P, BP, and respirations carefully during administration.

≠***Warning*** Keep resuscitative facilities readily available; have flumazenil available as antidote if overdose should occur.

● Keep patients in bed for 3 hr; do not permit ambulatory patients to operate a vehicle following an injection.

● Establish safety precautions if CNS changes occur (use side rails, accompany ambulating patient).

● Provide comfort measures and reassurance for patients receiving diazepam for tetanus.

Teaching points

● This drug will help you to relax and will make you go to sleep; this drug is a potent amnesiac and you will not remember what has happened to you.

● You may experience these side effects: Drowsiness, dizziness (these may become less pronounced after a few days; avoid driving a car or engaging in other dangerous activities if these occur

● Report severe dizziness, weakness, drowsiness that persists.

Scientific name**:-** atracurium ,**trade name** *TRACRIUM*

Scientific name**:-** cisatracurium .**trade name** Nimbex

Scientific name**:-** pancuronium.**trade name** pancuronium

Scientific name**:-** vecuronium **trade name** Norcuron

Drug classes

Neuromuscular

Junction Blockers

Therapeutic actions

NMJ blockers interfere with neuromuscular transmission and cause flaccid paralysis by blocking acetylcholine receptors at the skeletal neuromuscular junction.

Indications

● Adjuncts to general anesthetics to facilitate endotracheal intubation and relax skeletal muscle; to relax skeletal muscle to facilitate mechanical ventilation

Contraindicated in:

- Hypersensitivity

Adverse effects

● **Musculoskeletal:** Profound and prolonged muscle paralysis

● **Respiratory:** *Depressed respiration, apnea,* bronchospasm

■ **Nursing considerations**

Assessment

● **History:** myasthenia gravis, respiratory depression

● **Physical:** BP, R

Interventions

q***Black box warning*** Drug should be given only by trained personnel (anesthesiologists); intubation will be necessary.

● Arrange to have facilities on standby to maintain airway and provide mechanical ventilation.

● Provide neostigmine, or edrophonium (cholinesterase inhibitors) on standby to overcome excessive neuromuscular block.

● Provide atropine on standby to prevent parasympathomimetic effects of cholinesterase inhibitors.

● Change patient's position frequently, and provide skin care to prevent ulcer formation when drug is used for other than brief periods.

● Monitor conscious patient for pain or distress that he may not be able to communicate.

● Reassure conscious patients frequently.