

# The Significance of Anesthesia Drugs in Medical Field and its Functions in Surgical Interventions

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## DESCRIPTION

Introduction Anesthesia is a critical component of modern medical practice, enabling surgeons to perform complex procedures while ensuring patient comfort and safety. Central to the administration of anesthesia are various drugs that induce temporary loss of sensation or consciousness. These drugs are carefully selected and administered based on the patient's medical history, the type of procedure and the desired level of the sedation. In this study, we discuss into the types and functions of anesthesia drugs, highlighting their importance in the medical field.

### Types of anesthesia drugs

**Inhalation anesthetics:** Inhalation anesthetics are gases or volatile liquids that are inhaled by the patient to induce anesthesia. Common inhalation anesthetics include nitrous oxide, halothane, isoflurane and sevoflurane. These agents act the primarily by depressing the central nervous system, leading to loss of consciousness and pain sensation. Inhalation anesthetics are often used in combination with other drugs to achieve balanced anesthesia and minimize side effects.

**Intravenous anesthetics:** Intravenous (IV) anesthetics are drugs administered directly into the bloodstream to induce rapid and profound anesthesia. Examples of IV anesthetics include propofol, thiopental, ketamine and etomidate. These drugs exert their effects by acting on specific receptors in the brain, resulting in sedation, amnesia and muscle relaxation. Mainly IV anesthetics are commonly used for induction and maintenance of anesthesia during surgical procedures.

**Local anesthetics:** Unlike general anesthesia, which induces unconsciousness, local anesthetics block nerve impulses in a specific region of the body, resulting in temporary loss of sensation. Local anesthetics are frequently used for minor surgical procedures, dental work and in pain management. Common local anesthetics include lidocaine, bupivacaine, ropivacaine and procaine. These drugs are typically administered

via injection or topical application directly to the site requiring anesthesia.

**Neuromuscular Blocking Agents (NMBAs):** Neuromuscular blocking agents are drugs that induce muscle paralysis by interfering with neuromuscular transmission at the neuromuscular junction. While NMBAs themselves do not produce anesthesia or analgesia, they are used adjunctively to facilitate endotracheal intubation, optimize surgical conditions and prevent involuntary movements during procedures. Examples of NMBAs include succinylcholine, rocuronium, vecuronium and atracurium.

### Functions of anesthesia drugs

**Induction of anesthesia:** Anesthesia induction refers to the process of transitioning a patient from a state of wakefulness to unconsciousness and analgesia. Inhalation and intravenous anesthetics play a crucial role in the induction phase by rapidly inducing anesthesia while ensuring a smooth transition into unconsciousness.

**Maintenance of anesthesia:** Once anesthesia has been induced, maintenance of anesthesia involves sustaining the desired level of sedation and analgesia throughout the surgical procedure. Anesthesia drugs, both inhalation and intravenous, are titrated based on the patient's physiological response and the requirements of the surgical intervention.

**Pain management:** Anesthesia drugs, particularly opioids and local anesthetics, are instrumental in managing perioperative pain. Opioids such as morphine, fentanyl and hydromorphone are commonly used to provide intraoperative and postoperative analgesia, thereby minimizing discomfort and promoting patient comfort.

**Muscle relaxation:** Neuromuscular blocking agents are employed to achieve muscle relaxation and facilitate surgical procedures that require immobility or optimal surgical conditions. By temporarily paralyzing skeletal muscles, NMBAs enable surgical access, improve surgical field visualization and prevent patient movement during delicate procedures.

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Anesthesia drugs are indispensable tools in modern medicine, allowing for the safe and effective delivery of anesthesia during surgical procedures. From inhalation and intravenous anesthetics to local anesthetics and neuromuscular blocking agents, each drug serves a specific purpose in the anesthesia care continuum. Understanding the types and functions of

anesthesia drugs is essential for healthcare professionals involved in anesthesia administration, ensuring optimal patient outcomes and safety during surgical interventions.