General anesthetics

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Rationale

No single drug is capable of achieving these effects both rapidly and safely.
Classification

Inhalation anesthetics.

Intravenous anesthetics
**PREANESTHETIC MEDICATION**
- Anticholinergics
- Antiemetics
- Antihistamines
- Barbiturates
- Benzodiazepines
- Muscle relaxants
- Opioids

**GENERAL ANESTHETICS**

**INHALED**
- Desflurane
- Enflurane
- Halothane
- Isoflurane
- Nitrous oxide
- Sevoflurane

**INTRAVENOUS**
- Barbiturates
- Benzodiazepines
- Etomidate
- Ketamine
- Opioids
- Propofol

**LOCAL ANESTHETICS**
- Bupivacaine
- Lidocaine
- Procaine
- Tetracaine
Preanesthetic medications

Some functions of adjuncts to anesthesia

- Relieve anxiety (Benzodiazepines)
- Sedation (Barbiturates)
- Prevent allergic reactions (Antihistamines)
- Prevent aspiration of stomach contents and postsurgical nausea and vomiting (Antiemetics)
- Provide analgesia (Opioids)
- Prevent bradycardia and secretion of fluids into the respiratory tract (Anticholinergic drugs)
- Facilitation of intubation and relaxation (Muscle relaxants)
Inhalation Anesthetics

Isoflurane
Enflurane
Nitrous oxide.
Adverse effects

1. Respiratory and cardiac depression.

2. Sensitization of the heart to catecholamines. Dysrhythmias is produced in response to catecholamines.
3. Malignant hyperthermia..

4. Aspiration of gastric contents.

5. Hepatotoxicity.
Adjuncts to anesthesia are drugs employed to complement the beneficial effects of inhalation anesthetics and to counteract their adverse effects.
Preanesthetic medications

- Reduction of anxiety.
- Production of perioperative amnesia.
- Relief of preoperative and postoperative pain.
Preanesthetic medications:

1. Benzodiazepine
2. Opioids.
3. Anticholinergic drugs.
4. Neuromuscular blocking agents.
Postanesthetic medications:

1. Analgesic.
2. Antiemetics.
3. Muscarinic agonists.
Classification of inhalation anesthetics:


Halothane is the prototype of the volatile inhalation anesthetics.

Halothane is a high-potency anesthetic. Induction of anesthesia is smooth and relatively rapid. Halothane is only weakly analgesic.
Adverse effects:

1. Hypotension. Halothane causes hypotension by 2 mechanisms:
   a. The drug has a direct depressant effect on the myocardium;
   b. Halothane increases vagal tone.
2. Respiratory depression.
3. Sensitization of the heart to catecholamines.
5. Hepatotoxicity.
Nitrous oxide:

- NO is a gas anesthetic
- Has very low anesthetic potency.
- Has very high analgesic potency.

Because of its low anesthetic potency, it is never employed as a primary anesthetic agent. The most important toxic effect of nitrous oxide is postoperative nausea and vomiting.
Intravenous anesthetics:

Intravenous anesthetics may be used alone or to supplement the effects of inhalation agents.

Three drug families are employed as anesthetics:

Thiopental:

Thiopental is an ultra-short acting barbiturate. Employed for induction of anesthesia. Act rapidly to produce unconsciousness. Analgesic and muscle relaxant effects are weak. Has rapid onset of action and short duration of action.
Fentanyl:

Fentanyl is an opioid drug. It is administered in combination with a neuroleptic drug known as droperidol (Neuroleptic opioid combination).
Neuroleptic analgesia is characterized by quiescence, indifference to surroundings and insensitivity to pain; the patient appears to be sleep but is not.

Neuroleptic analgesia is employed for diagnostic and minor surgical procedures (e.g. bronchoscopy, repeated changing of burns dressings).
For some procedures, the combination of fentanyl plus droperidol is supplemented with nitrous oxide.

The state produced by this three-drug regimen is called Neuroleptic Anesthesia.

Neuroleptic anesthesia can be used for major surgical procedures.
Stages of anesthesia

I
Loss of pain sensation

II
Combative behavior

III
Surgical anesthesia

IV
Medullary paralysis and death
Study question

Halogenated anesthetics may produce malignant hyperthermia in:
A. Patients with poor renal function.
B. Patients allergic to the anesthetic.
C. Pregnant women.
D. Alcoholics.
E. Patients with a genetic defect in muscle calcium regulation.