Isoflurane, USP

Inhalation Anesthetic For Use in Horses and Dogs

**Caution:** Federal law restricts this drug to use by or on the order of a licensed veterinarian.

**DESCRIPTION**

IsoFlo (isoflurane, USP) is a nonflammable, nonexplosive general inhalation anesthetic agent. Its chemical name is 1-chloro-2,2,2-trifluoroethyl difluoromethyl ether, and its structural formula is:

![Structural formula of isoflurane](image)

Each mL contains 99.9% isoflurane.

Some physical constants are:
- Molecular weight 184.5
- Boiling point at 760 mm Hg 48.5°C
- Refractive index x20 1.2990 - 1.3005

**D**
- Specific gravity 25°C/25°C 1.496
- Vapor pressure in mm Hg** 20°C 238
   - 25°C 295
   - 30°C 367
   - 35°C 450
- Partition coefficients at 37°C:
  - Water/gas 0.61
  - Blood/gas 1.43
  - Oil/gas 90.8
- Partition coefficients at 25°C - rubber and plastic:
  - Conducive rubber/gas 62.0
  - Butyl rubber/gas 75.0
  - Polyvinyl chloride/gas 110.0
  - Polyethylene/gas 2.0
  - Polyurethane/gas -1.4
  - Polyolefin/gas -1.1
  - Butyl acetate/gas -2.5
- Parity by gas chromatography >99.9%

**CONTRAINDICATIONS**

IsoFlo (isoflurane, USP) is contraindicated in horses and dogs with a known sensitivity to isoflurane or to other halogenated agents.

**WARNINGS**

Increasing depth of anesthesia with IsoFlo (isoflurane, USP) may increase hypotension and respiratory depression. The electroencephalographic pattern associated with deep anesthesia is characterized by burst suppression, spiking and isoelectric periods. Since levels of anesthesia may be altered easily and rapidly, only vaporizers producing predictable percentage concentrations of isoflurane should be used (see DOSAGE AND ADMINISTRATION).

The action of nondepolarizing relaxants is augmented by isoflurane. Less than the usual amounts of these drugs should be used. If the usual amounts of nondepolarizing relaxants are given, the time for recovery from myoneural blockade will be longer in the presence of isoflurane than in the presence of other commonly used anesthetics.

**WARNING:** Not for use in horses intended for food.

**PRECAUTIONS**

Isoflurane is an inhalation anesthetic, can react with desiccated carbon dioxide (CO₂) absorbents to produce carbon monoxide which may result in elevated carboxyhemoglobin levels in some patients. Case reports suggest that barium hydroxide lime and soda lime become desiccated when fresh gases are passed through the CO₂ absorber canister at high flow rates over many hours or days. When a clinician suspects that CO₂ absorbent may be desiccated, it should be replaced before the administration of IsoFlo. Usage in Pregnancy: Reproduction studies have been performed in mice and rats with no evidence of fetal malformation attributable to Isoflo (isoflurane, USP). Adequate data concerning the safe use of isoflurane in pregnant and breeding horses and dogs have not been obtained.

**ADVERSE REACTIONS**

Hypotension, respiratory depression and arrhythmias have been reported. For customer service, adverse effects reporting, and/or a copy of the material safety data sheet, call (888) 299-7416.

**OVERDOSAGE**

In the event of overdosage, or what may appear to be overdosage, the following action should be taken: Stop drug administration, establish that the airway is clear and initiate assisted or controlled ventilation with pure oxygen as circumstances dictate.

**DOSAGE AND ADMINISTRATION**

Caution: Operating rooms should be provided with adequate ventilation to prevent the accumulation of anesthetic vapors. Premedication: A premedication regimen, which may be employed depending upon the patient's condition, may include an anticholinergic, a tranquilizer, a muscle relaxant and a short-acting barbiturate. Inspired Concentration: The delivered concentration of Isoflo (isoflurane, USP) should be known. Isoflurane may be vaporized using a flow-through vaporizer specifically calibrated for isoflurane. Vaporizers delivering a saturated vapor which then is diluted (e.g., VentiPak [isoflurane]) may also be used. The delivered concentration from such a vaporizer may be calculated using the formula:

\[
% \text{isoflurane} = \frac{100 \cdot \text{PA} - \text{PV}}{\text{FT}(\text{P}_a - \text{P}_c)}
\]

Where:
- PA = Pressure of atmosphere
- PV = Vapor pressure of isoflurane
- FT = Total gas flow used (mL/min)
- \text{P}_a = \text{P}_c = \text{P}_a - \text{P}_c

Isoflurane contains no stabilizer. Nothing in the drug product alters calibration or operation of these vaporizers.

**Induction:** Increased inspired concentrations of 3.0 to 5.0% isoflurane alone with oxygen following a barbiturate anesthetic induction are usually employed to induce surgical anesthesia in the horse. Dogs: Increased inspired concentrations of 2.0 to 2.5% isoflurane alone with oxygen following a barbiturate anesthetic induction are usually employed to induce surgical anesthesia in the dog. These concentrations can be expected to produce surgical anesthesia in 5 to 10 minutes.

**Maintenance:** The concentration of vapor necessary to maintain anesthesia is much less than that required to induce it. Horses: Surgical levels of anesthesia in the horse may be sustained with a 1.5 to 1.8% concentration of isoflurane in oxygen. Dogs: Surgical levels of anesthesia in the dog may be sustained with a 1.5 to 1.8% concentration of isoflurane in oxygen.

**HOW SUPPLIED**

IsoFlo (isoflurane, USP) is packaged in 100 mL ambercolored bottles.

Storage: Store at controlled room temperature 15°C - 30°C (59°F - 86°F).

**REFERENCES**