Fentanyl (parenteral) (fen-ta-nil)

**Sedative**

**Classification**

Therapeutic: opioid analgesics

Pharmacologic: opioid agonists

**Schedule II**

**Pregnancy Category C**

**Indications**

Analgesic supplement to general anesthesia, usually with other agents (ultra–short-acting barbiturates, neuromuscular blocking agents, and inhalation anesthetics) to produce balanced anesthesia. Induction/maintenance of anesthesia (with oxygen or oxygen/nitrous oxide and a neuromuscular blocking agent). Nondepolarizing/nonparalyzed (with or without nitrous oxide). Supplement to regional/local anesthesia. Preoperative and postoperative analgesia. Unlabeled Use: Continuous IV infusion as part of PCA.

**Action**

Binds to opiate receptors in the CNS, altering the response to and perception of pain. Produces CNS depression.

**Therapeutic Effects:**

Supplement in anesthesia. Decreased pain.

**Pharmacokinetics**

Absorption: Well absorbed after IM administration.

Distribution: Unknown.

Metabolism and Excretion: Mostly metabolized by the liver, 10–25% excreted unchanged in the bile.

Half-life: Children: Bolus dose—2.4 hr, long-term continuous infusion—11–36 hr. Adults: 2–4 hr (after cardiopulmonary bypass and in geriatric patients).

**TIME/ACTION PROFILE (analgesia*)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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</thead>
<tbody>
<tr>
<td>IM</td>
<td>7–15 min</td>
<td>20–30 min</td>
<td>1–2 hr</td>
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<tr>
<td>IV</td>
<td>1–2 min</td>
<td>5–10 min</td>
<td>0.5–1 hr</td>
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</tbody>
</table>

*Dependent; depression may last longer than analgesia

**Contraindications/Precautions**

**Contraindicated in:** Hypersensitivity, cross-sensitivity among agents may occur; known or suspected; Use Cautionally in: Geri: Geriatric, debilitated, or critically ill patients; Diabetes; Severe renal, pulmonary or hepatic disease; CNS tumors; Anterior pituitary; Head trauma; Acute or chronic alcoholism; Undiagnosed abdominal pain; Hypothyroidism; Alcoholism; Cardiac disease (arrhythmias); OB, Lactation: Pregnancy and lactation.

**Adverse Reactions/Side Effects**


**Interactions**

Drug-Drug: Avoid use in patients who have received MAO inhibitors within the previous 14 days (may produce unpredictable, potentially fatal reactions). Concurrent use of CYP3A4 inhibitors including ritonavir, ketoconazole, itraconazole, clarithromycin, nelfinavir, nefazodone, diltiazem, aprepitant, fluconazole, fosamprenavir, verapamil, and erythromycin may result in plasma levels and risk of CNS and respiratory depression. Additive CNS and respiratory depression with other CNS depressants (alcohol, antihistamines, antidepressants, other sedative/hypnotics, and other opioid analgesics). Risk of hypotension with betaadrenergic blockers. Nalbuphine, buprenorphine, or pentazocine may decrease analgesia.

Drug-Food: Grapefruit juice is a moderate inhibitor of the CYP3A4 enzyme system; concurrent use may increase blood levels and the risk of respiratory and CNS depression. Cardiac monitoring and dose adjustment is recommended.

**Route/Dosage**

**Preoperative Use**

IM, IV (Adults and Children ≥12 yr): 50–100 mcg 30–60 min before surgery.

**Adjunct to General Anesthesia**

Adjunct to Regional Anesthesia
IM, IV (Adults and Children > 12 yr): 50–100 mcg.

Postoperative Use (Recovery Room)
IM, IV (Adults and Children > 12 yr): 50–100 mcg; may repeat in 1–2 hr.

General Anesthesia
IV (Adults and Children > 12 yr): 50–100 mcg/kg (up to 150 mcg/kg).

Children 1–12 yr: 2–3 mcg/kg.

Sedation/Analgesia
IV (Adults and Children > 12 yr): 0.5–1 mcg/kg/dose, may repeat after 30–60 min.

IV (Children 1–12 yr):
Bolus—1–2 mcg/kg/dose, may repeat at 30–60 min intervals. Continuous infusion—1–5 mcg/kg/hr following bolus dose.

Continuous infusion—1–5 mcg/kg/hr following bolus dose. Continuous infusion—1–5 mcg/kg/hr following bolus dose.

IV (Neonates):
Bolus—0.5–3 mcg/kg/dose. Continuous infusion—1–5 mcg/kg/hr following bolus dose. Continuous infusion—1–5 mcg/kg/hr following bolus dose. Continuous infusion—1–5 mcg/kg/hr following bolus dose.

Continuous infusion—1–5 mcg/kg/hr following bolus dose.

Continuous infusion during ECMO—5–10 mcg/kg bolus followed by 1–5 mcg/kg/hr, may require up to 20 mcg/kg/hr after 5 days of therapy.

Potential Nursing Diagnoses
Acute pain (Indications)
Ineffective breathing pattern (Adverse Reactions)
Risk for injury (Side Effects)
Implementation
High Alert: Accidental overdosage of opioid analgesics has resulted in fatalities. Before administering, clarify all ambiguous orders; have second practitioner independently check original order, dose calculations, route of administration, and infusion pump programming.

Do not confuse fentanyl with sufentanil.

Benzodiazepines may be administered before or after administration of fentanyl to reduce the induction dose requirements, decrease the time to loss of consciousness, and produce amnesia. This combination may also increase the risk of hypotension.

IV Administration
pH: 4.0–7.5.

Direct IV: Diluent: Administer undiluted. Concentration: 50 mcg/mL. Rate: Injections should be administered slowly over 1–3 min. Administer doses > 5 mcg/kg over 5–10 min. Slow IV administration may reduce the incidence of muscle rigidity, tachycardia, and hypotension. Neuromuscular blocking agents may be administered concurrently to decrease chest wall muscle rigidity.

Intermittent Infusion: Diluent: May be diluted in D5W or 0.9% NaCl. Concentration: Up to 50 mcg/mL. Rate: see Direct IV.

Y-Site Compatibility: See individual drug information.

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fentanyl (parenteral)

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**V-Site Incompatibility:** amphotericin B, azithromycin, dantrolene, dexamethasone, diazoxide, pantoprazole, phenytoin, trimethoprim/sulfamethoxazole.

**Patient/Family Teaching**

- Discuss the use of anesthetic agents and the sensations to expect with the patient before surgery.
- Explain pain assessment scale to patient.
- Caution patient to change positions slowly to minimize orthostatic hypotension.
- Instruct patient to avoid alcohol or other CNS depressants for 24 hr after administration for outpatient surgery.

**Evaluation/Desired Outcomes**

- General quiescence.
- Reduced motor activity.
- Pronounced analgesia.