HYDROMorphone (Hydromorphone)

Dilaudid, Dilaudid-HP, Exalgo, Hydromorph Contin, Jurnista

**Classification**
Therapeutic: allergy, cold, and cough remedies (antitussives), opioid analgesics
Pharmacologic: opioid agonists

**Schedule II**
Pregnancy Category C

**Indications**
Moderate to severe pain (alone and in combination with nonopioid analgesics); extended-release product for opioid-tolerant patients requiring around-the-clock management of persistent moderate to severe pain; Amyotrophic lateral sclerosis (lower doses). A direct central action. Therapeutic Effects: Decrease in moderate to severe pain; Suppression of cough

**Pharmacokinetics**
Absorption: Well absorbed following oral, rectal, subcut, and IM administration. Extended-release product results in an initial release of drug, followed by a second sustained phase of absorption.

Distribution: Widely distributed. Crosses the placenta; enters breast milk.

Metabolism and Excretion: Mostly metabolized by the liver.

Half-life: Oral (immediate-release), or injection—2–4 hr; Oral (extended-release)—8–15 hr.

**TIME/ACTION PROFILE (analgesic effect)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO-IR</td>
<td>30 min</td>
<td>30–90 min</td>
<td>4–5 hr</td>
</tr>
<tr>
<td>PO-ER</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
</tr>
<tr>
<td>Subcut</td>
<td>15 min</td>
<td>30–90 min</td>
<td>4–5 hr</td>
</tr>
<tr>
<td>IM</td>
<td>15 min</td>
<td>30–60 min</td>
<td>2–3 hr</td>
</tr>
<tr>
<td>IV</td>
<td>10–15 min</td>
<td>15–30 min</td>
<td>2–3 hr</td>
</tr>
<tr>
<td>Rect</td>
<td>15–30 min</td>
<td>30–90 min</td>
<td>4–5 hr</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**
Contraindicated in: Hypersensitivity; Some products contain bisulfites and should be avoided in patients with known hypersensitivity; Severe respiratory depression (in absence of resuscitative equipment); Extended-release only; Acute or severe bronchial asthma; Respiratory depression (in absence of resuscitative equipment); Paralytic ileus; Respiratory depression (in absence of resuscitative equipment); Acute, severe, chronic, or postoperative pain (extended-release only); Prior GD surgery or narrowing of GD tract (extended-release only); Opioid non-tolerant patients (extended-release only).

**Use Cautiously in:** Head trauma; Intracranial pressure; Severe renal, hepatic, or pulmonary disease; Hypothyroidism; Seizure disorder; Adrenal insufficiency; Alcoholism; Severe COPD (including exacerbations); Aortic root disease and tricuspid valve disease; Use during pregnancy or lactation.

**Adverse Reactions/Side Effects**
CNS: confusion, sedation, dizziness, dysphoria, euphoria, hallucinations, headache, unusual dreams.
EENT: blurred vision, diplopia, miosis.
Resp: respiratory depression.
CV: hypotension, bradycardia.
GI: constipation, dry mouth, nausea, vomiting.
GU: urinary retention.
Derm: flushing, sweating.
Misc: physical dependence, psychological dependence, tolerance.

**Interactions**
Drug-Drug: Exercise extreme caution with MAO inhibitors (may produce severe, unpredictable reactions—reduce initial dose of hydromorphone to 25% of usual dose, discontinue MAO inhibitors 2 wk prior to hydromorphone). Risk of CNS depression with alcohol, antidepressants, antipsychotics, and sedative-hypnotics including benzodiazepines and phenothiazines. Administration of partial agonists (buprenorphine, butorphanol, nalbuphine, or pentazocine) may precipitate opioid withdrawal in physically dependent patients. Nalbuphine or pentazocine use may potentiate CNS depression.

**Route/Dosage**
Doses depend on level of pain and tolerance. Larger doses may be required during chronic therapy.
Analgesic

PO (Adults ≥50 kg): Immediate-release — 4–8 mg q 3–4 hr initially (some patients may respond to doses as small as 2 mg initially), or once 24 hr opioid requirement is determined, convert to extended-release by administering total daily oral dose once daily.

PO (Adults and Children ≤50 kg): 0.06 mg/kg q 3–4 hr initially, younger children may require smaller initial doses 0.015 mg/kg, Minimum dose 0.5 mg.

IV, IM, Subcut (Adults ≥50 kg): 1.5 mg q 3–4 hr as needed initially, may be increased by 0.5 mg q 3–4 hr as needed initially, may be increased.

IV (Adults): Continuous infusion (initially) 5–20 mg/hr depending on previous opioid use. (the initial dose of an hour may be given with subsequent breakthrough bolus of 30–50% of the hourly rate in mg)

Rect (Adults): 3 mg q 6–8 hr initially as needed.

Antitussive

PO (Adults and Children ≥12 yr): 1 mg q 3–4 hr

PO (Children 6–12 yr): 0.5 mg q 3–4 hr.

NURSING IMPLICATIONS

Assessment

● Assess BP, pulse, and respirations before and periodically during administration. If respiratory rate ≥ 18/min, assess level of sedation. If respiratory rate ≥ 10/min, assess level of sedation. Dose may need to be decreased by 25–50%. Initial drowsiness will diminish with continued use.

● Assess bowel function routinely. Institute prevention of constipation with increased intake of fluids and bulk, and laxatives to minimize constipating effects.

● Pain: Assess type, location, and intensity of pain prior to and 1 hr following IM or PO and 5 min (peak) following IV administration. When titrating opioid doses, increases of 25–50% should be administered until there is either a 50% reduction in the patient’s pain rating on a numerical or visual analogue scale or the patient reports satisfactory pain relief. When titrating doses of short-acting hydromorphone, a repeat dose can be safely administered at the time of peak if previous dose is ineffective and side effects are minimal.

● Patients on a continuous infusion should have additional bolus doses provided every 3–5 hr, assessed for breakthrough pain. The bolus dose is usually set at the amount of drug infused each hour by continuous infusion.

● Patients taking sustained-release hydromorphone may require additional short-acting or rapid-onset opioid doses for breakthrough pain. Doses of short-acting opioids should be equivalent to 50–100% of 24 hr total and given every 2 hr as needed.

● An equianalgesic chart (see Appendix B) should be used when changing routes or when changing from one opioid to another.

● Prolonged use may lead to physical and psychological dependence and tolerance. This should not prevent patient from receiving adequate analgesia. Most patients who receive hydromorphone for pain do not develop psychological dependence. Progressively higher doses may be required to relieve pain with long-term therapy.

● Taper: Taper off gradually during withdraw use.

● Lab Test Considerations: May q plasma amylase and lipase concentrations.

● Toxicity and Overdose: If an opioid antagonist is required to reverse respiratory depression or coma, naloxone (Narcan) is the antidote. Dilute the 0.4-mg ampule of naloxone in 10 mL of 0.9% NaCl and administer 0.02–0.04 mg by slow IV push every 2 min. For children and patients weighing ≤40 kg, dilute 0.1 mg of naloxone in 10 mL of 0.9% NaCl for a concentration of 10 mcg/mL and administer 0.5 mcg every 2 min. Titrated dose to avoid withdrawal, seizures, and severe pain.

Potential Nursing Diagnoses

Acute pain (Indications)

Chronic pain (Indications)

Risk for injury (Side Effects)

Implementation

● High Alert: Accidental overdose of opioid analgesics has resulted in fatalities. Before administering, clarify all ambiguous orders; have second practitioner independently check original order, dose calculations, and infusion pump settings.

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CONTINUED
HYDROMORPHONE

- Explain therapeutic value of medication prior to administration to relieve the analgesic effect.
- Be aware of the risk for overdose due to the high potency.
- Be careful when administering to patients with renal or hepatic impairment.
- Be aware of the risk for respiratory depression in patients with respiratory compromise.

Y-Site Compatibility:
- Direct IV:
  - When converting from immediate-release to extended-release hydromorphone, administer total daily oral hydromorphone dose daily, dose of extended-release hydromorphone, convert to total daily dose of hydromorphone.
  - When converting from immediate-release to extended-release hydromorphone, convert to total daily dose of hydromorphone.

Y-Site Incompatibility:
- Direct IV:
  - Do not mix with other medications.

Solution Compatibility:
- Direct IV:
  - May be administered with food or milk to minimize GI irritation.

Patient/Family Teaching:
- Direct IV:
  - May be administered with food or milk to minimize GI irritation.

Dilution:
- Direct IV:
  - Dilute with at least 5 mL of sterile water or 0.9% NaCl for injection. Ensure solution is clear and colorless.

High Alert:
- Direct IV:
  - Take precautions to prevent extravasation.

Overdosage:
- Direct IV:
  - Take precautions to prevent over-dosage.

Therapeutic Effects:
- Direct IV:
  - Addictive behaviors may occur, monitor patient for signs of addiction.

Side Effects:
- Direct IV:
  - Monitor for respiratory depression, sedation, and sedation.

Interactions:
- Direct IV:
  - Monitor for respiratory depression, sedation, and sedation.

Dosing:
- Direct IV:
  - Administer total daily oral hydromorphone dose once daily, dose of extended-release hydromorphone.

Preparation:
- Direct IV:
  - Swallow extended-release tablets whole; do not break, crush, dissolve, or chew.

Additional Information:
- Direct IV:
  - When converting from immediate-release to extended-release hydromorphone, convert to total daily dose of hydromorphone.
  - When converting from immediate-release to extended-release hydromorphone, convert to total daily dose of hydromorphone.
Avoid patient that hydromorphone is a drug with known abuse potential. Protect it from theft, and never give to anyone other than the individual for whom it was prescribed.

- May cause drowsiness or dizziness. Advise patient to call for assistance when ambulating or smoking. Caution patient to avoid driving or other activities requiring alertness until response to medication is known.
- Advise patient to notify health care professional if pain control is not adequate or if side effects occur.
- Advise patient to change positions slowly to minimize orthostatic hypotension.
- Instruct patient to avoid concurrent use of alcohol or other CNS depressants.
- Instruct patient to notify health care professional if allergies or OTC medications, vitamins, or herbal products being taken and consult health care professional before taking any new medications.
- Encourage patient to turn, cough, and breathe deeply every 2 hr to prevent atelectasis.
- Advise patient to notify health care professional if pregnancy is planned or suspected, or if breast feeding.

**Home Care Issues:**

- Explain to patient and family how and when to administer hydromorphone, discuss safe storage of the medication, and how to care for infusion equipment properly. **Pedi:** Teach parents or caregivers how to accurately measure liquid medication and to use only the measuring device dispensed with the medication.
- Emphasize the importance of aggressive prevention of constipation with the use of hydromorphone.

**Evaluation/Desired Outcomes**

- Decrease in severity of pain without a significant alteration in level of consciousness or respiratory status.
- Suppression of cough.

Why was this drug prescribed for your patient?