

Ketorolac Injection

02239944	SANDOZ CANADA INCORPORATED*	KETOROLAC TROMETHAMINE INJECTION USP	KETOROLAC TROMETHAMINE	30 MG / ML1 ml amp
02162644	HOFFMAN LAROCHE LTD	KETOROLAC TROMETHAMINE INJECTION USP	TORADOL IM	10 MG / ML1ml amp

*Sandoz is the only source of ketorolac tromethamine 30 ml/ml injection in Canada ^{1,2}

Indications³:

- Short term management (not to exceed 2 days) of moderate to severe acute pain, including pain following major abdominal, orthopaedic and gynecological operative procedures.
- Treatment of cancer pain in palliative care patients

Efficacy of IM ketorolac for acute pain: **NNT 10 mg = 5.7; 30 mg = 3.4; 60 = 1.8** (number needed to treat for one person to experience at least 50 % pain relief over 4 to 6 hours)⁴

Suggested alternatives for IM Ketorolac:

1. Oral Options; if patient is able to eat and drink

Oral analgesic	NNT for acute pain ⁴	Comments ⁴
Ibuprofen	400 mg = 2.5 600-800 mg = 1.7	tablets & oral suspension
Naproxen	500 mg = 2.7	NSAID with lowest risk of cardiovascular events
Celecoxib	200 mg = 3.5 400 mg = 2.1	↑ risk cardiovascular events, particularly with high dose; ↓ risk gastrointestinal adverse effects (modest and not applicable if patient on a PPI for gastroprotection)
Ketorolac	10 mg = 2.6	↑ risk of gastrointestinal adverse effects
Acetaminophen	500 mg = 3.5 1000 mg = 3.8*	Tablets & oral syrup
Acetaminophen + ibuprofen	500 + 200 mg = 1.6 ⁵ 1000 + 400 mg = 1.5	As effective than acetaminophen + opioid combinations ⁶
Acetaminophen + codeine	300/325 + 30 mg = 5.7 600/650 + 60 mg = 4.2	↑ adverse effects due to codeine content ⁶
Acetaminophen + tramadol	650 + 75 mg = 2.6	Not covered by SPEP; relatively expensive

*although NNT for 1000mg is slightly higher than that for the 500mg, a wide confidence interval for the 500mg NNT suggests significant potential for inaccuracy.

2. Rectal / Parenteral Options; if patient is NPO

	NNT for acute pain ⁴	Comments
Rectal suppositories		
Diclofenac*	50 mg = 2.7 (Oral)	50, 100 mg ↑ CV & hepatic risks
Naproxen**	500 mg = 2.7 (Oral)	500 mg
Parenterals		
Ibuprofen injectable IV infusion ***	400 mg = 2.5 (Oral) 600 - 800 mg = 1.7 (Oral)	400 – 800 mg by IV infusion over 30 min
Morphine SC, IM, IV	10 mg IM = 2.9	IM injection painful ⁷

* Diclofenac rectal suppositories compared with oral formulations have more rapid onset, but slower rate of absorption → lower Cmax but similar AUC.⁸

** Naproxen rectal suppositories are absorbed at same rate as oral formulations. Cmax occurs in 2 to 3 hours.⁹

*** NNT based on oral administration studies. Oral ibuprofen has a high availability, rapid onset; therefore IV ibuprofen effect on pain should be similar to that achieved with oral administration.

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