

Does IM Ketorolac Provide Superior Pain Relief to PO Ibuprofen?

Bottom Line Up Top: There is no difference in analgesic efficacy between oral and intramuscular NSAIDs.

Clinical Scenario: A 34-year-old woman presents to the ED with back pain. After your history and physical, you conclude that the patient's pain is muscular in origin and likely secondary to heavy lifting while moving apartments. You contemplate analgesic options and decide that a NSAID makes sense. Should you give her PO ibuprofen or IM ketorolac?

What Your Gut Says: Give the ketorolac IM. IM ketorolac will provide better pain relief and the patient will be happier with her care since she got an 'injection' and, after all, she did come all the way to the hospital.

What The Evidence Says: Unlike with many areas of medicine, there is ample evidence to answer this question and most of that evidence has been around for a couple of decades. Reviewing every study would be tedious and, fortunately, we've got a great review article on the topic. One important thing to understand is that the different NSAIDs have widely accepted equianalgesic doses; at the right dose, all NSAIDs (whether it be naproxen, ibuprofen, ketorolac or diclofenac) give equivalent pain relief ([Irizarry 2021](#)). This allows us to look at studies with the different NSAIDs and compare them to each other.

A 2007 review of the literature concluded that there was no difference in analgesia between IM ketorolac and PO ibuprofen ([Arora 2007](#)). The study included a number of high-quality research studies:

Study	Format	Comparison	Findings	Notes
Wright 1994	Retrospective analysis of prospectively collected data.	PO Ibuprofen 800 mg vs IM ketorolac 60 mg	No difference in analgesic effect.	Ibuprofen superior secondary to cost, ease of administration + lack of pain w/ administration.
Turturo 1995	Double-blind RCT	PO Ibuprofen 800 mg vs IM ketorolac 60 mg	No difference in analgesic effect.	Similar onset of action in mild-moderate pain.
Neighbor 1998	Double-blind RCT	PO Ibuprofen 800 mg vs IM ketorolac 60 mg	No difference in analgesic effect.	
Mixer 1998	Double-blind	PO Ibuprofen	No difference in	Surgical Patients

	RCT	800 mg vs IM ketorolac 60 mg	analgesic effect.	
Quereshi 2019	Double-blind RCT	IM diclofenac 75 mg vs PO diclofenac 100 mg	Small difference favoring IM in terms of speed to pain relief	Authors conclude PO superior due to time to prepare injection

The data looks fairly clear in terms of analgesic efficacy but, don't some patients simply prefer to receive a shot? While this dogmatic claim is often made, the data doesn't appear to support it.

Schwartz and colleagues performed an ingenious trial ([Schwartz 2000](#))

- Enrolled 64 ED patients with acute pain.
- Treatment arms:
 - Oral group: Orange drink (800 mg ibuprofen) + placebo "ibuprofen" pill
 - Injection group: Orange drink (800 mg ibuprofen) + placebo "ketorolac" injection
 - Essentially, all patients got the same analgesic medication (the orange drink) thinking it was just some juice and an inert study placebo (pill or injection).
- No significant difference in analgesia between the two groups.

Bottom Line: Just give the NSAID by mouth. IM NSAIDs may provide slightly faster time to analgesia but, IM dosing comes with the cost of injection, pain, a longer time to prepare the dose and more intensive nursing resources to administer the medication. As long as the patient's gut works, oral NSAIDs provide similar analgesic effects to IM dosing and should be the preferred route of administration.

Bonus Pearls:

- IM injection of ketorolac causes significant pain. If the patient can't take PO, be kind and pop in an IV.
- The ceiling pain relief dose for ketorolac is 15 mg IV ([Motov 2017](#)).

Read More

REBEL EM: [The Ketorolac Analgesic Ceiling](#)

References

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