

Table 4. Pharmacology of Nonopiate Analgesics (1,128,440,472)

Nonopiates (Route)	Onset	Elimination Half-Life	Metabolic Pathway	Active Metabolites	Dosing	Side-Effects and Other Information
Ketamine (IV)	30 - 40 sec	2 - 3 hr	N-demethylation	Norketamine	Loading dose 0.1 - 0.5 mg/kg IV followed by 0.05 - 0.4 mg/kg/hr	Attenuates the development of acute tolerance to opioids. May cause hallucination and other psychological disturbances.
Acetaminophen (PO) Acetaminophen (PR)	30 - 60 min variable	2 - 4 hr	Glucuronidation, sulfonation	None	325 - 1000 mg q4 - 6 hr; max dose <4 g/day)	May be contraindicated in patients with significant hepatic dysfunction.
Acetaminophen (IV)	5 - 10 min	2 hr	Glucuronidation, sulfonation	None	650 mg IV q4 h - 1000 mg IV q 6 hr; max dose <4 g/day	
Ketorolac ^a (IM/IV)	10 min	2.4 - 8.6 hr	Hydroxylation, conjugation/ renal excretion	None	30 mg IM/IV, then 15 - 30 mg IM/IV q6 hr up to 5 days; max dose = 120 mg/day x 5 days	Avoid in following conditions: renal dysfunction; gastrointestinal bleeding; platelet abnormality; concomitant angiotensin converting enzyme inhibitor therapy, congestive heart failure, cirrhosis, asthma. Contraindicated for the treatment of perioperative pain in coronary artery bypass graft surgery.
Ibuprofen (IV)	N/A	2.2 - 2.4 hr	Oxidation	None	400 - 800 mg IV q 6 hr infused over >30 min; max dose = 3.2 g/day	
Ibuprofen (PO)	25 min	1.8 - 2.5 hr	Oxidation	None	400 mg PO q 4 hr; max dose = 2.4 g/day	
Gabapentin (PO)	N/A	5 - 7 hr	Renal excretion	None	Starting dose = 100 mg PO TID; maintenance dose = 900 -3,600 mg/day in 3 divided doses.	Side effects: (common) sedation, confusion, dizziness, ataxia. Adjust dosing in renal failure pts. Abrupt discontinuation associated with drug withdrawal syndrome, seizures.
Carbamazepine immediate release (PO)	4 - 5 hr	25 - 65 hr initially, then 12-17 hr	Oxidation	None	Starting dose = 50- 100 mg PO BID; maintenance dose = 100 - 200 mg q4 -6 hr; max dose = 1200 mg/day	Side effects: (common) nystagmus, dizziness, diplopia, lightheadedness, lethargy; (rare) aplastic anemia and agranulocytosis; Stevens-Johnson syndrome or toxic epidermal necrolysis with HLA-B1502 gene. Multiple drug interactions due to hepatic enzyme induction.

PO = orally; PR = rectally; max = maximum; IM = intramuscular; N/A = not applicable.

^a For patients >65 yr or <50 kg, 15 mg IV/IM every 6hrs to a maximum dose of 60 mg/day for 5 days.

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