

World Health Organization Analgesic Ladder
Step 3 Opioid Analgesics for Moderate to Severe Pain: Pharmacokinetics and Costs

Generic Drug (Trade Drug)	Typical Dose	Approximately Equivalent to	Onset Effect (min)	Peak Effect (min)	Duration Effect (hr)	Plasma Half-Life (hr)	Cost in \$ for Typical Dose
Step 3 Agonist Drugs							
Morphine sulfate <i>Immediate release</i> tablets and liquids Sust. release (MS Contin, Oramorph SR, Kadian) Injectable (Astramorph, Duramorph, Infumorph)	30* mg PO 30* mg PR	Morphine 10 mg IM Morphine 10 mg IM	20-60	120	4-5	2-3	0.27 (tab) 0.60 (liq) 1.36 (PR)
	30 mg PO	Morphine 10 mg IM		210	8-12		1.39
	10 mg IM 5 mg IV	Morphine 10 mg IM Morphine 10 mg IM	10-30 5	60 20	4-5 2-4		0.64 0.32
Oxycodone <i>Immediate release</i> (Roxicodone) <i>Controlled release</i> (OxyContin)	5 mg PO 30 mg PO	Codeine 60 mg PO Morphine 10 mg IM Morphine 30 mg PO	0-15	60	3-4	2-3	0.25 1.47
	30 mg PO	Morphine 30-60 mg PO**	30-60	60 & 420	12	4.5	?
Methadone (Dolophine)	20 mg PO	Morphine 10 mg IM Methadone 10 mg IM	30-60	90-120	4-6	15-25	0.28
	10 mg IM 5 mg IV	Morphine 10 mg IM Morphine 10 mg IM	10-20	60-120 15-30	4-5 3-4		0.56 0.28
Hydromorphone (Dilaudid)	7.5 mg PO 3 mg PR 1.5 mg IM 1 mg IV	Morphine 10 mg IM Hydromorphone 1.5 mg IM Morphine 10 mg IM Morphine 10 mg IM	30 15-30 15 10-15	90-120 30-90 30-60 15-30	4 4-5 4-5 2-3	2.5-4	1.05 2.91 0.50 0.33
Oxymorphone (Numorphan)	1 mg IM .5 mg IV 10 mg PR	Morphine 10 mg IM Morphine 10 mg IM Oxymorphone 1 mg IM	10-15 5-10 15-30	30-90 15-30 60	3-6 3-4 3-6	2.6-4	2.93 1.47 9.47
Levorphanol (LevoDromoran)	4 mg PO	Morphine 10 mg IM Levorphanol 2 mg IM	10-60	90-120	4-5	15	1.12
	2 mg IM 1 mg IV	Morphine 10 mg IM Morphine 10 mg IM		60 15	4-5 3-4		2.04 1.32
Fentanyl (Sublimaze) (Duragesic)	.1 mg IM 25-50 mcg/hr transdermal	Morphine 10 mg IM Morphine 30 mg sustained-release q 8 hr	7-15 6 hr	20-30 12-24 hr	1-2 72	3.6 17	1.73 9.12-13.67
Step 3 Agonist-Antagonist Drugs							
Butorphanol (Stadol); see pentazocine	2 mg IM 2 mg IV	Morphine 10 mg IM Morphine 10 mg IM	10-30 2-3	30-60 30	3-4 2-4	2.5-4	6.04
Nalbuphine (Nubain); see pentazocine	10 mg IM 10 mg IV	Morphine 10 mg IM Pentazocine 60 mg IM	15 2-3	60 30	3-6 3-4	5	1.62
Dezocine (Dalgan)	10 mg IM	Morphine 10 mg IM	30	60-120	3-6	2.4	6.26
Step 3 Partial Agonist Drugs							
Buprenorphine (Buprenex)	.4 mg IM	Morphine 10 mg IM	15	60	6	3	2.92

Key: PO=oral; PR=rectal; IM=intramuscular; IV=intravenous. *PO cost is based on least expensive, 100 tablet quantity, generic preparation if available, and IV or IM is based on least expensive. *use 60 mg in single-dose situation and 30 mg in repeated-dose situations; ** use 60 mg as initial conversion and titrate to analgesic effect.*

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