

Opioid Comparisons^{1,2}

Medication	Equianalgesic Doses (mg)			Pharmacokinetic Profile (oral formulations)															
	IV/SC	PO	PR	Onset	Duration														
Morphine sulfate IR CR ³ (MS Contin/Oramorph) MR ³ (Avinza/Kadian)	10	30	30	20-30min 2-4h 1-2h	3-6h 8-12h 12 or 24h														
Codeine	120	200	200	30-60min	3-4h														
Hydrocodone		30		20-30min	3-4h														
Hydromorphone	1.5	4.5	4.5	20-30min	2-4h														
Oxycodone IR CR ³		20		20-30min 2-4h	4-6h 8 or 12h														
Oxymorphone ⁴ IR ER ³	1	10		30-60min 1-3h	4-6h 8 or 12h														
			Onset	Duration															
Fentanyl ⁵	180 mg oral morphine/24hrs = 100 mcg transdermal fentanyl/hour 1 mg IV morphine = 10 mcg IV fentanyl		TD ³ : 12-16 hours IV: 1-5 min	TD ³ : 48-72h IV: 0.5-2h															
Methadone	Conversion Ratios: -Oral: IV = 2:1 -Oral Morphine: Methadone is based on 24-hr morphine total <table border="0"> <tr> <td>24 hr. Oral Morphine Total</td> <td>Oral Morphine: Methadone Ratio</td> </tr> <tr> <td><30 mg</td> <td>2:1</td> </tr> <tr> <td>31-99 mg</td> <td>4:1</td> </tr> <tr> <td>100-299 mg</td> <td>8:1</td> </tr> <tr> <td>300-499 mg</td> <td>12:1</td> </tr> <tr> <td>500-999 mg</td> <td>15:1</td> </tr> <tr> <td>>1000 mg</td> <td>20:1</td> </tr> </table>		24 hr. Oral Morphine Total	Oral Morphine: Methadone Ratio	<30 mg	2:1	31-99 mg	4:1	100-299 mg	8:1	300-499 mg	12:1	500-999 mg	15:1	>1000 mg	20:1	<ul style="list-style-type: none"> • Inter-individual variability exists; methadone should be used by experienced clinicians only. • Doses may need to be decreased after several days of administration; monitor vital signs daily and consult a specialist. • May cause QT interval prolongation at higher doses. 		
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IR = immediate release CR = controlled release MR = modified release ER = extended release TD = transdermal

1 Always individualize therapy based on patient specific characteristics.

2 May need to decrease doses in presence of renal insufficiency.

3 Medications formulated to be long-acting are given on a regular schedule, not on an "as needed" schedule.

4 Administer at least 1 hour before or 2 hours after a meal.

5 Often used in pts w/renal insufficiency due to less accumulation of active metabolites.

Children and Adults less than 50 kg Body Weight (Recommended opioid STARTING doses)

OPIOID AGONISTS	ORAL STARTING DOSE	PARENTERAL STARTING DOSE
Codeine	0.5-1 mg/kg q 3-4 hr prn	Not recommended
Hydrocodone with Acetaminophen (Vicodin)	0.2 mg/kg q 3-4 hr prn	
Hydromorphone (Dilaudid)	0.06 mg/kg q 3-4 hr prn	0.015 mg/kg q 3-4 hr prn
Methadone (Methadose)	0.2 mg/kg q 4-8 hr prn	0.1 mg/kg q 4-8 hr prn
Morphine	0.3 mg/kg q 3-4 hr prn	0.05-0.1 mg/kg q 2-4 hr prn
Oxycodone (Roxicodone)	0.2 mg/kg q 3-4 hr prn	
Fentanyl (Duragesic)	transderm/mucosal-0.5-2 mcg/kg/h	0.5-2 mcg/kg/h as a continuous infusion

See comments under Opioid Comparisons table for additional warnings/precautions.

Principles for Using Opioids Effectively

- 1) Perform a comprehensive assessment to identify type(s) and severity of pain.
- 2) Starting doses are based on severity of pain and current medication use. As a guide, use the 3-step approach: non-opioid for mild pain; low-dose opioid or opioid/non-opioid combination medication for moderate pain; strong opioid for severe pain.
- 3) Manage the side effects of opioids. See "Managing Side Effects" table.
- 4) Add co-analgesics medications as indicated by type of pain. See "Co-Analgesics" table.
- 5) The following opioids are not recommended for the treatment of chronic pain: meperidine, propoxyphene, codeine, pentazocine, nalbuphine.
- 6) Schedule medications based on duration of action. If the analgesic does not last stated duration of action, increase the dose, not the frequency.
- 7) Reassess patient after initiation/change of therapy. Adjust doses to maximize comfort and minimize side effects.
- 8) To account for incomplete cross-tolerance when converting to a new opioid, start with 50%-75% of the equianalgesic dose of the new opioid and titrate to effectiveness.
- 9) When using opioids around the clock for persistent pain, always have a short-acting opioid (rescue) available for breakthrough pain.
 - a) The rescue dosage is 10-15% of the 24-hr total of the around-the-clock dose.
 - b) Oral rescue doses should be available every 1-2 hours; parenteral rescue doses should be available every 15-30 minutes.
 - c) If the patient is consistently using more than 2 rescue doses per day, increase the around-the-clock dose.
- 10) In non-verbal patients, the single most reliable indicator of pain behavior is a change from baseline behavior.
- 11) There are several numeric and visual pain scales available for clinical use. References available upon request.



Co-Analgesics¹

Pain Source	Pain Character	Drug Class	Examples
Bone or Soft Tissue	Tenderness over bone or joint. Pain on movement. Inflammatory pain.	NSAID	Ibuprofen (Advil/Motrin) 400-800mg q 4-6 h - Inexpensive - Maximum dose 3200mg/day - Susp. 100mg/tsp
			Celecoxib (Celebrex) 100mg q 12 h - COX-2 inhibitor - fewer GI side effects - Do not use if sulfa allergy
			Ketorolac (IV) 15mg q 6 h
Anxiety	Generalized restlessness and discomfort.	Benzo-diazepine	Diazepam (Valium) 2-10mg q 6-12 h - PO, SL, IV, PR - Intensol solution 5mg/ml - Half-life: 20-80 h - Maintenance schedule of q12h after resolution of acute anxiety is often adequate
			Lorazepam (Ativan) 0.5-4mg q 4-6 h - PO, SL, IV, SQ, PR - Intensol solution 2mg/ml - Half-life: 10-20 h
		Anti-histamine	Hydroxyzine (Atarax/Vistaril) 10-50mg q 4-8 h - PO, IM - Liquid available
		Butyrophenone	Haloperidol (Haldol) 0.5-4mg q 4-8 h - PO, SL, IV, SQ, PR - Maintenance schedule of q12h after resolution of acute anxiety is often adequate
Nerve Damage or Dysaesthesia	"Burning" or "shooting" pain radiating from plexus or spinal root.	Anti-depressants	Desipramine (Norpramin) 10-150mg q hs - PO - May be sedating - Fewer side effects than amitriptyline
			Nortriptyline (Pamelor) 10-150mg q hs - Start low and titrate q3-4d based on effectiveness and side effects - Analgesic dose typically less than antidepressant dose - Use with caution in cardiac disease
			Duloxetine (Cymbalta) 30-120 mg daily - Use with caution if hepatic impairment
		Anti-convulsants	Gabapentin (Neurontin) 100-1200mg tid - PO - Maximum dose up to 6000mg/day
			Pregabalin (Lyrica) 50 mg bid-tid - Possesses a favorable pharmacokinetic profile - Max dose 600mg/day
			Valproic Acid (Depakote) 250-1500mg q hs or divided doses - PO - Sustained release - Immediate release - Sustained release sprinkle
			Topiramate (Topamax) 25-50 mg q 12 h - PO - Max dose 400mg/day
Smooth Muscle Spasms	Colic-Cramping abdominal pain, bladder spasms	Anti-cholinergic	Hyoscyamine (Levsin) 0.125-0.25 q 4-8 h - PO, SL, IV, SQ - Sustained release available - IV dose: 0.1-0.2mg q 4 h
			Glycopyrrolate (Robinul) 1-2mg q 4 h PO
			Scopolamine (Transderm Scop) 1.5mg patch q 72 h
			Dicyclomine (Bentyl) 10-20mg q 8 h - PO, IM, 10mg/tsp syrup
			Oxybutynin (Ditropan) 5-10mg q 8 h - Tablets or liquid - Available in sustained release

¹ May need to decrease doses in presence of renal insufficiency.

Management of Opioid Side Effects

Symptom	Recommended Medication	Comments
Constipation	Softener + Laxative (Docusate + Senna)	- Individuals do not develop tolerance to this side effect. - Initiate bowel protocol with initiation of opioid therapy. - Titrate to effectiveness with goal of BM at least q2-3 days. - Avoid bulk-forming laxatives if PO fluid intake is < 2 liters/day. - If pain controlled, consider dosage reduction or opioid rotation to manage the following side effects.
Nausea/Vomiting	Metoclopramide 10 mg AC & HS Haloperidol 0.5 mg po q 4 h prn	- Individuals often develop tolerance to nausea/vomiting after several days of opioid therapy - Metoclopramide is drug of choice as 70% of persons develop nausea/vomiting with initiation of opioid therapy and 50% develop gastric paresis. - Use Haloperidol in absence of gastric stasis on an as needed basis
Sedation	Methylphenidate or Dextroamphetamine 2.5 - 5 mg q AM and Noon	- Individuals often develop tolerance to sedation after several days of opioid therapy. - Continued reports of pain when sedated may indicate need for a CNS stimulant or co-analgesic for pain syndromes identified in Co-Analgesic Table.
Pruritus	Doxepin 10 mg QD-BID Emollient lotion	- In addition to antidepressant effects, tricyclic antidepressants have antihistamine effects. - Potential for pruritus is greatest with morphine; consider switching to equianalgesic dose of a different opioid.
Respiratory Depression	This is NOT an expected side effect with chronic administration of opioids.	- Individuals develop tolerance to respiratory depression after several days of opioid therapy. - The fear of respiratory depression is exaggerated and often leads to inadequate analgesia. - Data supports large doses of opioids adequate to relieve pain do not hasten death.

Ohio Pain Initiative
555 Metro Place North, Suite 650
Dublin, OH 43017
(614) 763-PAIN



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References available at www.ohiopaininitiative.org

