OPIOID ANALGESIC: COMPARISON CHART [1,2,3,4,5,6]

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Opioid Generic name	receptor target	Route	TRADE Name(s)	Dosage Forms	Equivalent Dose	Interval ~ duration	Comparative Dose & Cost	$ /30d	Comments Reassess regimens frequently when starting!
Morphine	mu	PO	*M.O.S; MS-IR; STATEX*	Oral Soln: 1,5,10,20 mg/ml Tab:5,10,20,25,30,40,50,60mg	**Oral 20-30mg** in chronic dosing ‡ (≤60mg in acute dosing)	4 h	20mg po q4h	$76 $75	◆morphine: gold standard for opioids; {M-6-G metabolite-↑SEs if renal dysfx ◆may sprinkle M-Eslon or Kadian ◆MS Contin may also be given pr ◆↑side effects in pts with renal failure ◆MS Contin,PMS & RATIO Morphine SR are ONLY interchangeable SR products.
Morphine SR (12h)		PO	*MS CONTIN/PMS & RATIO SR* *MOS-SR* *M-ESLON*	Tab:(15,30,60) [all 3 brands],100,200ç mg Tab: 30,60mg Cap: 10,15,30,60,100,200mg		12 h (q8-12h)	60mg po q12h	$78 $76 $75	
Morphine SR (24h)		PO	*KADIAN*	Cap: 10mg✗▼,20,50,100mg		24 h	100mg po q24h	$94	
Morphine Supp		PR	*STATEX supp*	Supp: 5, 10, 20, 30mg		4 h	20mg pr q4h	$459	◆**addiction** to opioids rare when no drug abuse hx & when used for pain management; consider ***guidelines*** for chronic pain & ***treatment agreements***.
Morphine Inj.		SC/IM/IV	*MORPHINE*	Amp: 5,10,15,25,50 mg/ml Syringe: 50ml X 50mg/ml	**10mg Inj.**	4 h	10mg sc q4h	$197	
Fentanyl	mu	Transdermal	*DURAGESIC* ☎▼ Patch; heat ↑absorption rate	**Patches**: 25,50,75,100 ug/hr (initial onset delayed ~12-24hr)	see comments	72 h (q48-72h)	25ug/hr q72h 50ug/hr q72h ‡	$116 $213	◆25ug/hr ≅ 90mg oral morphine/day ◆not suitable for opioid naïve or acute pain
Fentanyl / Sufentanil - SL		✗ ⊗	◆sometimes injectable forms given SL for breakthrough/incidental pain (5min prior to transfers/position changes)						◆quick acting & very short duration
Hydromorphone	mu	PO	*DILAUDID*	Tab: 1,2,4,8mg Oral Liquid: 1mg/ml	4-6mg	4 h	4mg po q4h	$55 $75	◆may have less SE's than morphine in some patients (e.g. sedation, nausea,const.) ◆"SC Pain Pump" option ◆Palladone XL od 12,16,24mg cap ✗✆: (EtOH may dramatically ↑↑ levels)[7]
Hydromorphone SR (12h)		PO	*HYDROMORPH-CONTIN* ✆	Cap: 3,6,12,18,24,30 mg (may sprinkle contents)		12 h (q8-12h)	12mg po q12h	$122	
Hydromorphone Supp		PR	*DILAUDID*	Supp: 3mg		4 h	3mg pr q4h ‡	$459	◆use **laxatives** (e.g. senna, lactulose) to prevent constipation; consider short-term/prn **antinauseant** in patients at risk.
Hydromorphone Inj.		SC/IM/IV	*DILAUDID*	Inj: 2mg/ml; 10mg/ml; 20mg/ml; 50mg/ml; Sterile Powder: 250mg	2-3mg	4 h	1.5-2mg sc q4h	$250	
Oxycodone SR (12h)		PO	*OXYCONTIN* ✆	Tab: 10,20,40,80mg; (5mg✗ ⊗)	10-15mg	8-12 h	20mg po q12h ‡	$95	◆**biphasic**; some may require q8h
Oxycodone regular	mu & κ	PO	*OXY-IR*	Tab: 5ç,10ç,20ç mg		4-6h	15mg po q6h (cost based on 1½ x 10mg)	$86	[Percocet ç✗▼=oxycodone 5mg + acetamin.325mg] [Percodan ✗▼=oxycodone 5mg + ASA 325mg]
		PO / PR	*SUPEUDOL* ✗▼	Tab: 5ç, 10ç mg; Supps:10,20mg					
Methadone 1ç,5ç,10ç,25ç mg tab✗; 1mg/ml susp		PO	◆useful for opioid rotation & pain+addiction strategies; require **special license**; long acting & complicated dosing. (SK drug coverage-palliative care)						**mu,** δ, NMDA
Meperidine	mu & NMDA	PO	*DEMEROL* See Comments	Tab: 50ç mg (**poorly absorbed!**)	300mg	2-3 h	100mg po q3h ‡	$75	◆**not for chronic pain**: **short acting** & requires frequent dosing. **Toxic metabolites** accumulate esp. in ↓renal fx ⇒ **CNS toxicity** (tremor, seizures, etc.)
Meperidine Inj.	or Pethidine	IM/SC/IV	*DEMEROL* See Comments	Amp:50,100mg/ml; (25,75 mg/ml)✗	75mg	2-3 h	50mg im q3h ‡	$253	
Propoxyphene		PO	*642* ⊗	Tab: 65mg	100mg?	2-3 h	65mg po q4h ‡	$30	◆Max 390mg prop. plain/day; **abuse risk** ◆DIs!!: alcohol & CNS depressants.
Propoxyphene napsylate		PO	*DARVON-N* ✗ ⊗	Cap: 100mg (=65mg propox.)	150mg?	2-3 h	100mg po q4h ‡	$50	
Codeine	mu	PO	*CODEINE*	Tab: 15,30ç mg; Syrup: 5mg/ml	200mg	4 h	60mg po q4h ‡	$40	◆Codeine: weak opioid; avoid doses over 800mg po; practical analgesic ceiling ≅200mg po or 120mg im /d where low doses of stronger opioids may be more effective & better tolerated than codeine ◆antitussive at dose of ≥15mg q4-6h ◆may cause ↑ constipation & GI upset ◆caution with combination agents: -risk of: hepatotoxicity with >4g/d of acetaminophen; GI bleed with ASA
Codeine SR (12h)		PO	*CODEINE CONTIN* ☎✆	Tab: 50,100ç,150ç,200ç mg		12 h	150mg po q12h ‡	$70	
Codeine Inj.		IM	*CODEINE* ✗▼	Amp: 30,60mg	120mg	4 h	30mg sc q4h ‡	$190	
Acetaminophen (A.) **+Codeine** (C.) **+/- Caffeine** (Cf) Prodrug of morphine; requires metabolism by CYP**2D6**; ~10% genetically deficient; CYP inhibitors can ↓ analgesic effect (ie fluoxetine, paroxetine, Haldol)		PO	*TYLENOL + C. Elixir* ***TYLENOL # 1*** Non-Rx ✗ ⊗ ***TYLENOL # 2*** ***TYLENOL # 3*** ***Ratio-EMTEC-30*** ***TYLENOL # 4***	Elix: A. 320mg+C. 16mg/10ml Tab: A. 300mg+C. 8mg +Cf. Tab: A. 300mg+C. 15mg +Cf. Tab: A. 300mg+C. 30mg +Cf. Tab: A. 300mg+C. 30mg Tab: A. 300mg+C. 60mg	≤200mg C.	4+ h	20ml po q6h ‡ ii tab po q4-6h ‡ " " "	$243 $55 $33 $35 $63 $66	
ASA/Codeine/Caffeine		PO	*292* *282* ✗▼	Tab: 375mg/**30**mg/30ç mg 375mg/**15**mg/30ç mg	≤200mg C.	4+ h	ii tab po q4-6h ‡	$80	

Acetaminophen 325mg + **Tramadol** 37.5mg *TRAMACET* ✗ ⊗: New in Canada[2005]. 2 tablets po q4-6h ~ $170/mo (Max 8tabs/day). Low affinity for **mu** receptors & also ↑serotonin & noradrenaline. Metabolized by CYP**2D6**.

Pentazocine *TALWIN* - Tab: 50ç mg (50mg po q4h $80; Max: 600mg/d po); Amp: 30mg (30mg im q4h $200; Max: 360mg/d im) ◆less effective than NSAIDs & other opioids; agonist-antagonist (**mu** & **κ**): can cause withdrawal in pts on opioids.

‡ with **chronic** admin., equivalent po morphine dose is ~**2-3X the inj. dose** but in acute pain, it may be ≤ 6X; ‡ =dose listed not equivalent ☎ =EDS Sask ✗ =Non Formulary Sk **Cost**=to consumer in SK ç=scored tab **d** =day ✆=prior NIHB ▼covered NIHB **CTZ**=chemoreceptor trigger zone **OTC**=over the counter. **Adverse Rx's**: nausea, vomiting, constipation, sedation, confusion/CNS effects, resp depression, myoclonus, urine retention, dry mouth, hormonal (e.g. ↓ testosterone & cortisol, ↑ prolactin)

Use short acting formulations ***PRN for breakthrough pain***. Chronic opioid therapy in pts with **renal dysfunction** = may lead to accumulation of toxic metabolites (esp. **meperidine**); switching opioids or opioid rotation strategies may be useful. **Drug Interactions**: CNS depressants (e.g. alcohol, sedatives, neuroleptics). **Patients intolerant to the side effects** of one opioid may be changed to a **≤** dose of another; True morphine **allergy** is very rare. **Switching** opioids, often **25**-50% less than equivalent is given to account for incomplete cross-tolerance. **SC Pain Pumps** available. **Adjunct Options** NSAIDs, antidepressants[TCA], anticonvulsants; dexamethasone 10mg sc/po bid.

Antinauseants: **metoclopramide** 10mg po/sc q4h prn, **domperidone** 5-10mg po tid ac (effect CTZ & GI motility); **haloperidol** 0.5-1mg po/sc bid prn (CTZ); **prochlorperazine** 5-10mg im/iv/po/pr q6h prn (effects CTZ but sedating); dimenhydrinate 25-50mg po/im/iv/sc/pr q6h prn

Opioid immunoassay: Synthetics (meperidine, fentanyl series, propoxyphene, methadone) will be opiate negative and must be ordered independently. Semi-synthetics (hydrocodone, oxycodone, hydromorphone, oxymorphone, buprenorphine) may be opiate positive or negative, depending on the threshold. Interpret false negatives with caution. Drug specific confirmatory testing may be required.

Pregnancy Category ⇑ C/D ⇑ B/D

Strong Opioids

Weak Opioids C/D ⇓

[1] Ballantyne JC, Mao J. Opioid Therapy for Chronic Pain. N Engl J Med. 2003 Nov 13;349(20):1943-1953.
[2] Micromedex 2005
[3] Hansten, PD and Horn JR. Drug Interactions Analysis and Management. Applied Therapeutics Incorporated. Vancouver, WA. 2005.
[4] Drugs in Pregnancy & Lactation 7th edition, 2005.
[5] Morrison, R. Sean, Meier, Diane E., Palliative Care. N Engl J Med 2004 350: 2582-2590.
[6] Gilron I, Bailey JM, Tu D, et al. Morphine, gabapentin, or their combination for neuropathic pain. N Engl J Med. 2005 Mar 31;352(13):1324-34. (InfoPOEMs: The combination of gabapentin & morphine provides a small but clinically unimportant benefit over either drug alone. Tricyclic antidepressants have been shown in other studies to be as effective as gabapentin & much less expensive, but were not studied in this trial. (LOE = 1b))
[7] Health Canada Aug 2005 http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/2005/2005_84_e.html

Additional references:

Eisenberg E, McNicol ED, Carr DB. Efficacy and safety of opioid agonists in the treatment of neuropathic pain of nonmalignant origin: systematic review and meta-analysis of randomized controlled trials. JAMA. 2005 Jun 22;293(24):3043-52. CONCLUSIONS: Short-term studies provide only equivocal evidence regarding the efficacy of opioids in reducing the intensity of neuropathic pain. Intermediate-term studies demonstrate significant efficacy of opioids over placebo for neuropathic pain, which is likely to be clinically important. Reported adverse events of opioids are common but not life-threatening. Further RCTs are needed to establish their long-term efficacy, safety (including addiction potential), and effects on quality of life.

Kokki H, Lintula H, Vanamo K, et al. Oxycodone vs placebo in children with undifferentiated abdominal pain: a randomized, double-blind clinical trial of the effect of analgesia on diagnostic accuracy. Arch Pediatr Adolesc Med 2005;159:320-25. (InfoPOEMs: Giving analgesics to children with abdominal pain does not obscure the surgical diagnosis. We don't need to make kids suffer while waiting for a surgeon to evaluate their abdominal pain. (LOE = 2b))

See also RxFiles Newsletter – Fall, 2005 - Opioids in Chronic Non-Malignant Pain Troubleshooting Drug Therapy Issues www.RxFiles.ca