PAIN

TREATMENT TABLES

Analgesics

NON-OPIOID ANALGESICS

	Generic Name	Trade Names (Examples)		Duration	Initial Dose
NON-OPIOID	Tramadol 50 mg	Ultram®		Every 4 hours	1-2 tabs, max 8 tabs/ day maximum dose is 400 mg/day
	Tramadol 37.5 mg Acetaminophen 325 mg	Ultracet® *Non-formulary – Not Available*		Every 4 hours	1-2 tabs, max 8 tabs/day or 300 mg/day Tramadol and 2600 mg/day Acetaminophen

OPIOID EQUI-ANALGESIC CONVERSION TABLE

	Generic Name	Trade Names (Examples)	Equianalgesic Dosing	Minimum Duration	Initial Dose (Opioid Naïve)
SHORT-ACTING	Codeine	Parenteral form *Non-formulary-Not Available*	120 mg SC/IM 200 mg PO	3 hours	15-60 mg
	Hydrocodone & Acetaminophen	Vicodin®, Lortab®, Lorcet® (2.5-10 mg HC); Always with acetaminophen ** or Ibuprofen; *Non-formulary-Not Available*	30 mg PO	3 hours	1-2 tabs
	Hydromorphone	Dilaudid®	1.5 mg SC/IV 7.5 mg PO	2 hours	1-2 mg SC/IV 1-4 mg PO
	Morphine Sulfate* Immediate Release	Roxanol®	10 mg SC/IV 30 mg PO	2 hours	2-15 mg IV 10-30 mg PO
	Oxycodone Immediate Release	Roxicodone®; Oxyfast® (high concentration, liquid, *Non-formulary*) Also in Percocet®, Percodan®, Tylox®, Roxicet®,	20 mg PO	3 hours	5 - 10 mg PO max 8 tabs (for Acetaminophen)
LONG-ACTING ****	Fentanyl Transdermal	Duragesic®: Do not use for opioid naïve patients. Available as 25, 50, 75, 100 mcg/hour patch	*Follow conversion charts from manufacturer*	48 hours	25 mcg/hr
	Methadone ***	Dolophine®	3.3 mg SC/IV 10-15 mg PO	4 hours (1st dose)	2.5-10 SC/PO
	Morphine Controlled Release	MS Contin® *Non-formulary* Oramorph®	30 mg PO	8 hours	10-30 mg PO
	Oxycodone Controlled Release	Oxycontin®	20 mg PO	12 hours	10 mg PO
	Meperidine	Demerol® (not recommended except for prevention/treatment of rigors; non-formulary for PCA or PO use)	75 mg IV 300 mg PO	2 hours	25-50 mg IV Rigors or shivering

Notes:

- Onset of action: 30-60 min PO, 5-10 min IV, 10-20 min SC, 12-16 h Transdermal
- *Available commercially as rectal suppositories. When converting from the oral to the rectal route, start with the same amount as the oral dose and titrate as necessary.
- **Maximum doses of acetaminophen 4000 mg/day.
- ***Methadone accumulates with repeated dosing. Chronic dosing requires less frequent administration (every 8 – 12 hrs). Consult pain service or pharmacist for questions.
- ****Continue to treat for break-through pain for controlled release medications, i.e. 24 hours for Fentanyl patch & 48-72 hours for MS Contin. *Breakthrough Pain*: Dose should be equivalent of 10-15% of daily narcotic requirement.

Conversion Examples:

1.5 mg IV Hydromorphone = 100 mcg IV/SC Fentanyl = 20 mg PO Oxycodone = 10 mg IV Morphine

Conversion from IV to PO: Example Morphine 10 mg IV = 30 mg PO (multiple by 3)

PCA (Patient Controlled Analgesia)					
Titrate to pain relief; monitoring for side effects; start with lower dose and increase.		**Usual Doses**			
		Loading and Basal	**PCA Dose**	**Delay**	**Hour Limit**
PCA *(Patient Controlled Analgesia)*	Morphine Sulfate Standard concentration = 1 mg/mL	Loading Dose: 2 mg; repeat PRN Basal Rate: 0 – 2 mg/hour	0.5 - 2 mg	5 - 10 min delay	7.5 – 12.5 mg/hour
	Hydromorphone Standard concentration = 0.2 mg/mL	Dilaudid® Loading Dose: 0.4 mg repeat PRN Basal Rate: 0 – 0.2 mg/hour	0.1 – 0.3 mg	5-10 minute delay	1.2 – 2.0 mg/hour
	Fentanyl Standard concentration = 10 mcg/mL	Loading Dose: 25 mcg; repeat PRN Basal Rate: 0-10 mcg/hour	5-20 mcg	4-8 minutes	75-125 mcg/hour

Co-Analgesics / Adjuncts

(Consult pharmacists for patients already on similar class drugs.)

Pain Source	Pain Character	Drug	Example	
Bone or Soft Tissue	Tenderness over bone or joint. Pain on movement.	NSAID (Follow creatinine)	**Ibuprofen**	• 200-800 mg PO q6hr • Max. dose 3200 mg /day
			Naproxen	• 250-500 mg PO q12hr, not to exceed 1500 mg/day
			Celecoxib (Celebrex®) • Should be reserved for patients with a history of ulcers or GI bleed on chronic NSAIDS	• 100-200 mg PO daily
			Ketorolac (Toradol®) • Use for no longer than 5 days	• 30 mg IM/IV q6hr, maximum dose 120 mg/day • 15 mg IM/IV q6hr, over age 65 or renal function impairment • 20 mg, PO initial dose, then 10 mg every 4-6 hours, maximum dose 40 mg / day
Nerve Damage or Dysethesia	"Burning" or "shooting" pain radiating from plexus or spinal root	Antidepressants (start with low dose)	**Nortriptyline (Pamelor®)** • If intolerance to amitriptyline or high risk for intolerance (ie, elderly)	• 10-75 mg PO at bedtime
			Amitriptyline (Elavil®) • Best studied • Sedating	• 10-100 mg PO at bedtime
			Doxepin (Sinequan®) • More appropriate than Elavil for patient age > 70	• 10-150 mg PO daily • Adult max dose 300 mg/day • Elderly max dose 150 mg/day
			Venlafaxine, extended release (Effexor®XR) • With food	• 150 mg PO daily (75 mg/day initially, titrate every 4 days)
		Anticonvulsant Check LFT's before starting and q 1 week x 2 and reassess	**Gabapentin (Neurontin®)** • Slow gradual hs increase	• Initial dose 100 mg PO TID, increase by 300 mg per week • Max. dose 3600 mg/day
			Carbamazepine (Tegretol®) • Sedating • Check CBC	• 100 mg PO BID • Titrate to 400-800 mg/day as tolerated; titrate slowly
			Pregabalin (Lyrica®) • Renally eliminated • Dose reductions if CrCl < 60 mL/min	• 50 mg PO TID (or 75 mg BID) • Titrate to 100 mg TID (or 150 mg BID) as tolerated • Max dose = 600 mg/day
Skeletal Muscle Spasms	Cramping or Spasm	Muscle Relaxants (Can use PRN or Routinely)	**Baclofen (Lioresal®)**	• 10 mg PO TID, max 80 mg daily
			Cyclobenzaprine (Flexeril®) Maximum 60 mg daily	• 10 mg PO TID
			Tizanidine (Zanaflex®) • May decrease blood pressure • Reserve for patients intolerant to Baclofen	• 4 mg PO TID • Max – 36 mg daily *(considerably higher cost)*
			Orphenadrine (Norflex®) *Non-formulary (oral)*	• 100 mg PO BID • 60 mg IV q12hr

Pain Source	Pain Character	Drug	Example	
Anxiety	Generalized restlessness and discomfort (R/O hypoxia)	Benzodiazepines (not recommeneded for chronic pain)	**Clonazepam (Klonopin®)**	0.5 mg PO TID
			Diazepam (Valium®)	2-10 mg PO BID
			Lorazepam (Ativan®)	0.5–4 mg IV/PO q4hr
Itching		Antihistamines	**Hydroxyzine (Atarax®/Vistaril®)**	• 25 – 100 mg PO TID • Parenteral hydroxyzine by IM injection only – last resort • Anti-nausea properties
			Diphenhydramine (Benadryl®)	• 25-50 mg q4hr • PO or parenteral • Liquid available • Anti-nausea properties

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SUGGESTED CONVERSION FROM IV PCA TO ORAL THERAPY*

24 HOUR IV PCA USE		SUGGESTED PO STARTING DOSES**	
Morphine	**Hydro-morphine (Dilaudid®)**	**Scheduled (Choose one)**	**PRN (breakthrough) (Choose one)**
15 mg	2.2 mg	Tylox® 1 cap Q4H or Q6H (max 8 caps/day) ***OR*** Oramorph® 15 mg PO Q12H ***OR*** OxyContin® 10 mg PO Q12H	Tylox 1 cap Q4H prn (max 8 caps/day) ***OR*** Oxycodone 5 mg Q4H prn
20 mg	3 mg	Tylox 1 cap Q4H max 8 caps/day) ***OR*** Oramorph 30 mg Q12H ***OR*** OxyContin 10 mg Q12H	Tylox 1or 2 caps Q4H prn (max 8 caps/day) ***OR*** Morphine 10 mg Q4H prn ***OR*** Oxycodone 5 mg Q4H prn
25 mg	3.75 mg	Tylox 1-2 caps Q4H (max 8 caps/day) ***OR*** Oramorph 30 mg Q12H ***OR*** OxyContin 20 mg Q12H	Morphine 10 mg Q4H prn ***OR*** Oxycodone 5 mg Q4H prn
30 mg	4.5 mg	Oramorph 30mg Q8H or 45mg Q12H ***OR*** OxyContin 20 mg Q12H	Tylox 1 or 2 caps Q4H prn (max 8 caps/day) ***OR*** Morphine 10 or 15 mg Q4H prn ***OR*** Oxycodone 5 or 10 mg Q4H prn
35 mg	5.25 mg	Oramorph 30mg Q8H or 45mg Q12H ***OR*** OxyContin 30 mg Q12H	Tylox 1 or 2 caps Q4H prn (max 8 caps/day) ***OR*** Morphine 10 or 15 mg Q4H prn ***OR*** Oxycodone 10 mg Q4H prn
40 mg	6 mg	Oramorph 30 mg Q8H ***OR*** OxyContin 30 mg Q12H	Tylox 1 or 2 caps Q4H prn (max 8 caps/day) ***OR*** Morphine 10 or 15 mg Q4H prn ***OR*** Oxycodone 10 mg Q4H prn
45 mg	6.75 mg	Oramorph 60 mg Q12H ***OR*** OxyContin 30 mg Q12H	Tylox 1 or 2 caps Q4H prn (max 8 caps/day) ***OR*** Morphine 20 mg Q4H prn ***OR*** Oxycodone 10 mg Q4H prn
50 mg	7.5 mg	Oramorph 60 mg Q12H ***OR*** OxyContin 40 mg Q12H	Tylox 1 or 2 caps Q4H prn (max 8 caps/day) ***OR*** Morphine 20 mg Q4H prn ***OR*** Oxycodone 10 mg Q4H prn

*Equianalgesic Doses: morphine 10 mg IV = hydromorphine 1.5 mg IV = morphine 30 mg PO = oxycodone 20 mg PO.

**In calculating the oral dose, the acetaminophen content of Tylox (500 mg APAP) is equal to approximately 2.3 mg oxycodone. Therefore, one Tylox® capsule (5 mg oxycodone/500 mg APAP) is approximately equal to 7.5 mg oxycodone.

***Maximum acetaminophen dose is 4000 mg/day. For certain patient populations (elderly, heavy alcohol use or preexisting hepatic disease), the dose should be 2000 mg/day or less.

Adapted from M. McCaffery, 2002

OPIATE ANALGESICS – RELATIVE COSTS AT SHANDS

Drug and Dose	Daily Cost	Drug and Dose	Daily Cost
Tylenol #3		**Tylox**	
2 tabs PO q6hr	$$ (tab) $$ (liquid)	2 caps PO q6hr	$ (caps) $$ (liquid)
Oxycodone		**Oxycodone SR (Oxycontin)**	
10 mg PO q6hr	$$ (tabs) $$$ (liquid)	10 mg PO q12hr 20 mg PO q12hr 40 mg PO q12hr	$$ $$ $$$
Morphine		**Morphine SR (Oramorph)**	
2 mg IV q4hr 4 mg IV q4hr 10 mg PO q4hr PCA	$$ $$ $$ $$$	15 mg PO BID 30 mg PO BID 60 mg PO BID 100 mg PO BID	$ $ $ $
Hydromorphone (Dilaudid)		**Fentanyl (transdermal)**	
2 mg IV q4hr 4 mg IV q4hr 2 mg PO q4hr 4 mg PO q4hr PCA	 $$$ $$$ $ $$ $$$	25 mcg q72hr 50 mcg q72hr 75 mcg q72hr 100 mcg q72hr	$$ $$$ $$$ $$$

Legend: $ < $1/day; $$ ≥ $1 – <$5/day; $$$ ≥ $5/day. Note: $ reflect Shands acquisition costs, and are not reflective of patient charges, nor of drug costs outside the institution.

EQUIANALGESIC DOSES FOR CONVERTING MORPHINE TO TRANSDERMAL FENTANYL

Oral 24-hour Morphine (mg/day)	IM Morphine (mg/day)	Fentanyl Dose (micrograms/hour)
45 – 134	8 – 22	25
135 – 224	23 – 37	50
225 – 314	38 – 52	75
315 – 404	53 – 67	100
405 – 494	68 – 82	125
495 – 584	83 – 97	150
585 – 674	98 – 112	175
675 – 764	113 – 127	200
765 – 854	128 – 142	225
855 – 944	143 – 157	250
945 – 1034	158 – 172	275
1035 – 1124	173 – 187	300

The analgesic activity ratio of 10 mg IM morphine to 100 micrograms of IV fentanyl was used to derive the equivalence of morphine to fentanyl patches. A 10 mg IM or 60 mg PO dose of morphine every 4 hours for 24 hours (total 60 mg/day IM or 360 mg/day oral) was considered approximately equivalent to a fentanyl 100 microgram patch.

Source: Texas Pain Initiative Handbook.