UC San Diego Health System

EQUIANALGESIC DOSING GUIDELINE

Dose is dependent on response and individual patient characteristics

Doses listed are NOT recommended starting doses

Drug Name	Approximate Equianalgesic Dose		Analgesia Onset (mins), Peak Effect (mins), Duration (hours)		Starting Dose Recommendations, PCA Recommendations, Formulary Comments	Clinical Considerations
	Oral	Parenteral	Oral (IR only)	Parenteral		
Morphine	15 mg	5 mg	O: 15 -60 PE: 60 -90 D: 3 -6	O: 5 -10 PE: 10- 30 D: 2 -6	PCA Starting Dose for Opiate Naïve Patient: Bolus: 1 mg, No basal rate, lockout: 10 min or longer **Give 2-4 mg IV ONE TIME with PCA initiation** Decreasing lockout time is not recommended to prevent 'dose stacking'	• Metabolites may accumulate in patients with renal impairment causing excessive sedation and neurotoxicity; start with lower doses/longer intervals in patients with renal dysfunction • Use with caution in patients on IHD; additional doses may be needed after dialysis • Long-acting products should be scheduled around-the-clock, not PRN • 5 mg of oral morphine = one 5/300 mg Vicodin tablet
Hydrocodone	15 mg	- - - -	O: 20 -40 PE: 60 -90 D: 3 -6	- - - -	**Recommended products at UCSDHS:** •Tablet with 5 mg hydrocodone and 300 mg acetaminophen •Elixir with 2.5 mg hydrocodone and 167 mg acetaminophen / 5 mL •**Starting dose: 5-10 mg (1-2 tablets) PO q4h or q6h**	• Converted to Hydromorphone by CYP2D6 • Metabolites behave similar to morphine (see above) • Presence of Acetaminophen (APAP) should be recognized; cumulative APAP dose should NOT exceed 4000 mg/24 hrs • One 5/300 mg Vicodin tablet = 5 mg of oral morphine
Oxycodone	10 mg	- - - -	O: 15 -30 PE: 60 -90 D: 4 -6	- - - -	**Recommended products at UCSDHS:** If combined with acetaminophen → •Tablet with 5 mg oxycodone and 325 mg acetaminophen •**Starting dose: 5-10 mg PO q4h** Long-acting product (Oxycontin®) should not be used to treat acute pain	• Metabolites behave similar to morphine (see above) • Contraindicated in patients on dialysis • Long-acting products should be scheduled around-the-clock, not PRN • Oxycodone is MORE potent then Morphine • 5 mg of oxycodone ~ one 5/325 mg Percocet (325 mg of acetaminophen provides little or no measurable additional analgesia) • If using Oxycodone/APAP, do not exceed 4000 mg acetaminophen/24 hrs
Hydromorphone	3 mg	1 mg	O: 15 -60 PE: 60 -90 D: 4 -6	O: 5 -20 PE: 15 -30 D: 3 -4	PCA Starting Dose for Opiate Naïve Patient: Bolus: 0.2 mg, No basal rate, lockout: 10 min or longer **Give 0.5-1 mg IV ONE TIME with PCA initiation** Decreasing lockout time is not recommended to prevent 'dose stacking'	• Slow IV onset and peak effect compared to Morphine and Fentanyl • Metabolites may accumulate in patients with renal impairment causing excessive sedation and neurotoxicity; start with lower doses/longer intervals in patients with renal dysfunction • Use with caution in patients on IHD; additional doses may be needed after dialysis
Tramadol	150 mg	- - - -	O: 60 PE: 90 D: 4-6	- - - -	Starting dose: 50 mg PO q6h	• Max dose is 400 mg/24 hrs • Weak inhibitor of serotonin and norepinephrine reuptake • Lowers seizure threshold (increased risk in patients taking MAOis, TCAs, SSRIs, others w/ seizure risk)
Fentanyl (IV)	- - - -	50 mcg	- - - -	O: 1-2 PE: 5 -7 D: 0.75 -2	PCA Starting Dose for Opiate Naïve Patient: Bolus: 10 mcg, No basal rate, lockout: 10 min or longer **Give 25-50 mcg IV ONE TIME with PCA initiation** Decreasing lockout time is not recommended to prevent 'dose stacking'	• May be used in renal impairment and IHD, no active metabolites • Faster onset than most opiates; 100 X more potent than Morphine • May accumulate due to lipophilicity after prolonged use
Oxymorphone	5 mg	- - - -	O: 15-30 PE: 30 -45 D: 5 -8	- - - -	**Not on UCSD Formulary; avoid use.	• Oral bioavailability is 10%
CHRONIC PAIN ONLY						
Fentanyl Patch (Transdermal)	25 mcg/hr transdermal fentanyl equianalgesic to 60 mg PO morphine Q24h		**Transdermal** O: 12 -18(h) PE: 24-72(h) D: 48-72		Patch: Fentanyl – 12, 25, 50, 75, 100 mcg/hr	• NOT for treatment of acute pain • NOT for opiate naïve patients (taking <60 mg PO morphine equivalents /24 hrs for 7 consecutive days) • DO NOT up-titrate more frequently than ONCE WEEKLY • Pain or Palliative Care management consultation recommended prior to initiation
Methadone	Pain or Palliative care consult recommended. Converting to methadone is not advised without consultation with pain specialist. Biphasic and extended half-life require caution.					
REVERSAL WITH NALOXONE						
Naloxone	**Opiate-induced respiratory depression (RR ≤ 8 breaths/min and O2 Sat < 90% or >5% decrease from baseline of < 90%): Naloxone 0.1 mg IV q2min PRN respiratory depression** **Opiate-induced respiratory depression AND hypoxia requiring assisted ventilation: Naloxone 1 mg IV q2min PRN** • May need repeated doses or continuous infusion, depending on amount and type of opioid given. Duration of action of some opioids may exceed that of naloxone. • Titrate dose carefully to avoid precipitation of profound withdrawal, seizures and severe pain					

Approximate Ratios for Different Routes of Administration

IV/SC/IM		Epidural		Intrathecal
1	:	0.1	:	0.01

Conversion Calculation Methods:

Example 1: 20mg IV hydromorphone → PO morphine

20 mg IV hydromorphone = X mg PO morphine
1 mg IV hydromorphone = 15 mg PO morphine (from table)

Solving for X:

$$X = \frac{(20 \text{ mg IV hydromorphone} \times 15 \text{ mg PO morphine})}{1 \text{ mg IV hydromorphone}} = 300 \text{ mg PO morphine}$$

****25% dose reduction**: 300 x 0.75 = 225 mg PO morphine in 24 hours**

Example 2: Patient is taking 80 mg Oxycodone SR PO q12h for chronic pain, but is now NPO → you want to convert to IV fentanyl PCA

160 mg PO oxycodone = X mcg IV fentanyl
10 mg PO oxycodone = 50 mcg IV fentanyl

Solving for X:

$$X = \frac{(160 \text{ mg PO oxycodone} \times 50 \text{ mcg IV fentanyl})}{10 \text{ mg PO oxycodone}} = 800 \text{ mcg IV fentanyl}$$

****25% dose reduction**: 800 x 0.75 = 600 mcg IV fentanyl**

Fentanyl PCA order: 25 mcg/hr basal rate (600 mcg/24hrs = 25 mcg/hr);
50 mcg bolus (PRN dose = 10%-20% of **TDD***);
8 min lockout

***TDD – Total daily dose**

****25% dose reduction for incomplete cross-tolerance is recommended only for patients with GOOD pain control at the time of conversion**

References:

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PQRSTU Method of Pain Assessment

P – *precipitating and palliating* **–** what brings or worsens the pain? What relieves the pain? What medications have been tried, what the response was?

Q – *quality* **–** patients description of pain (e.g. stabbing, shooting, throbbing etc.)

R – *region and radiation* **–** location of pain; does the pain move? Is it deep inside or superficial?

S – *severity* **–** quantify the pain using numeric (or other) scale; what is the pain after pain medication has been given?

T – *temporal* **–** Is the pain constant or intermittent? If intermittent, how many times a day does it occur? How long does it last?

U – *you* **–** affect on patients life, ability to sleep, ambulate, affect on appetite, mood etc.

Six Step Approach to Opiate Conversion

Step 1: Globally assess the patient (i.e. PQRSTU) to determine if the uncontrolled pain is secondary to worsening of existing pain or development of a new type of pain

Step 2: Determine the total daily usage of current opioid. This should include long-acting, around the clock and breakthrough medications. (**Important! Must know EXACTLY how much patient is using, not just estimate from prescribed frequency)**

Step 3: Decide which opioid will be used for a new agent and consult the established conversion table to arrive at the proper dose of the new opioid.

Step 4: Reduce the total daily dose of the new opiate by 25% if pain control was good before conversion (no dose reduction if pain control was poor)

Step 5: Individualize the dosage based on assessment from Step 1 and ensure adequate access to breakthrough medication

Step 6: Patient follow-up and re-assessment

UCSD Resources

For help with pain management, contact the Pain Service on-call provider, Palliative Care (Howell Service) on-call provider, or unit pharmacist.

UC San Diego
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Opioid Equianalgesic Conversion Guide

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Created by Dmitri Lerner, PharmD.