

Switching opioids using equivalence tables

When switching patients to a different opioid agent, equivalence tables are used to estimate an equipotent dose of the target opioid. However, variation among patients in bioavailability of oral opioids, unpredictable or incomplete tolerance between opioids and other patient-specific issues must also be considered.¹⁻⁴

A suggested protocol is described below and demonstrated in Figure 1.

1. Calculate the total daily dose of the current opioid.⁵
2. Use an equivalence table to estimate the equivalent amount of target opioid.⁵
3. Decrease the calculated dose by:
 - 50 % if the patient is on a high dose of the current opioid
 - 25 to 40 % if on a low to moderate dose⁶
4. Further dose adjustments may be necessary depending on individual patient factors:
 - Type of pain - acute or chronic (higher doses may be required for acute pain)⁴
 - Co-morbidities (e.g. liver or renal dysfunction) – check monographs⁷
 - Age (e.g., elderly are more susceptible to adverse effects of opioids – consider starting with a lower dose)⁶
 - Medication profile - dose may need to be adjusted to prevent adverse effects due to drug interaction⁷
5. The initial dose can then be titrated as necessary to maintain pain control. An immediate release opioid may also be indicated for incident/breakthrough pain, especially during the titration period. To calculate a single PRN dose, use 10 to 15% of the total daily dose.⁴
6. Advise patients / caregivers to:
 - Record the number of rescue doses used and report signs and symptoms of undertreatment of pain.
 - Report signs and symptoms of oversedation (slurring words, mood swings, loss of coordination, falling asleep during conversation or other activities).
7. Follow-up with patients to assess pain control and adverse effects. The Canadian Guideline for the Safe and Effective Use of Opioids recommends a three day tolerance check after initiating a new opioid.⁷

Figure 1: Example of opioid switch

Patient with chronic non-cancer pain is being switched from Oxycontin 50 mg BID to Hydromorph Contin due to changes in oxycodone coverage.

- 24 hour dose of Oxycontin = $50 \times 2 = 100$ mg oxycodone
- Method 1:
 - Using Table 1 (see below), convert to oral morphine equivalent $100 \times 1.5 = 150$ mg / 24 hr
 - Convert 150 mg morphine equivalent to hydromorphone = $150 \times 0.2 = 30$ mg hydromorphone / 24 hr
- Method 2: Using morphine equivalents from Table 1
 - $\frac{20 \text{ mg oxycodone}}{6 \text{ mg hydromorphone}} = \frac{100 \text{ mg oxycodone}}{X \text{ mg hydromorphone}}$
 - $X = 100 \times 6/20 = 30$ mg hydromorphone / 24 hrs
- Decrease dose by 50 % = 15 mg hydromorphone / 24 hrs
= 7.5 mg Hydromorph Contin every 12 hours
- Hydromorph Contin is available in 6 mg and 9 mg formulations. Base the dose decision on the patient's pain history and risk factors for opioid adverse effects.
 - If the patient's pain was not well-controlled on Oxycontin 50 mg BID and the patient is not at high risk for adverse effects, consider starting the patient on the higher dose: Hydromorph Contin 9 mg BID.
 - If the patient was doing well on Oxycontin and / or there are concerns regarding overdose, consider starting on the lower dose: Hydromorph Contin 6 mg BID.
- Calculate dose needed for PRN immediate release rescue opioid
 - If patient is started on Hydromorph Contin 9 mg BID, rescue dose is 10 to $15\% \times 18 \text{ mg} = 0.1$ to $0.15 \times 18 \text{ mg}$ hydromorphone = 1.8 to 2.7 mg hydromorphone. The patient can be provided with hydromorphone immediate release 2 mg with instructions to take one dose PRN breakthrough pain.
 - .If patient is started on Hydromorph Contin 6 mg BID, the rescue dose is 10 to $15\% \times 12 \text{ mg} = 0.1$ to $0.15 \times 12 \text{ mg}$ hydromorphone = 1.2 to 1.8 mg hydromorphone. The patient can be provided with hydromorphone immediate release 1 mg with instructions to take one or two PRN breakthrough pain.
- Follow-up with the patient in a minimum of 3 days. Adjust dose if necessary based on pain control, amount of rescue medication needed and any adverse effects. Add the 24 hour total of rescue medication to the total sustained release dose.
 - For example, if the patient took 6 hydromorphone 2 mg tablets in the past 24 hours, add 12 mg to the total daily dose of Hydromorph Contin and calculate rescue dose based on new total.

Table 1: Oral Opioid Analgesic Equivalence Table(Adapted from Canadian Guideline for Safe and Effective Use of Opioids⁶)

Opioid	Equivalence to oral morphine 30 mg:	To convert to oral morphine equivalent multiply by:	To convert from oral morphine multiply by:
Morphine	30mg	1	1
Codeine *	200 mg	0.15	6.67
Oxycodone	20 mg	1.5	0.667
Hydromorphone	6 mg	5	0.2
Meperidine **	300 mg	0.1	10
Methadone	Morphine dose equivalence not reliably established.		
Tramadol *			
Transdermal fentanyl	60–134 mg morphine = 25mcg/h 180–224 mg = 50 mcg/h 225–269 mg = 62 mcg/h 270–314 mg = 75 mcg/h 315–359 mg = 87 mcg/h 360–404 mg = 100 mcg/h	These estimates are conservative; therefore, DO NOT use these values for reverse conversion (e.g. fentanyl to morphine)	

* Codeine and tramadol are both prodrugs that are metabolized to active metabolites, and it is possible that someone who lacks the ability to metabolize them or is taking a drug which inhibits their metabolism may essentially be opioid naive. Direct conversion from codeine or tramadol to transdermal fentanyl is not recommended.

** Meperidine is not recommended for chronic pain.

Table 2: Oral – Parenteral Opioid Analgesic Equivalence Table^{5,7}

Opioid	Parenteral	Oral
Morphine	10 mg	20 – 30 mg
Hydromorphone	2	4 – 6 mg
Meperidine	75	300 mg
Fentanyl	0.1 mg	-

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