TABLE 1: OPIOID EQUIANALGESIC TABLE

NB: It is important to recognize the limitations of opioid equianalgesic tables.
Equianalgesic doses have been derived based on studies using *typical* opioid doses, for *acute*, *short-term* use. With chronic use, tolerance develops, resulting in reduced efficacy and increased dosing requirement. Due to lack of complete cross tolerance among opioids, when switching from one opioid to another, it is often necessary to use a lower than "equianalgesic" dose, i.e. reduce the calculated dose by 33-50%, (taking into account patient's level of pain, side effects they experience and history of opioid use/tolerance) and retitrate to response. This is recommended when converting patients at very high dose levels.

Drug	Equianalgesic Dose		Initial Adult Dose (Adults >50kg) (Lower end of initial dose range is recommended in elderly or severe renal or liver disease)		Comments
	IV/SC/IM	Oral	Parenteral (NB: IM administration discouraged.)	Oral (using immediate release / short-acting product)	
MORPHINE	**10 mg**	**20-30 mg**	2-10mg IV/SC/IM q4h (Suggested starting dose: Severe pain: 7.5-10mg; Mild to moderate pain: 2.5-5mg; Elderly / severe renal or liver disease: start at low dose)	5-20mg q4h* (Suggested starting dose: Severe pain: 15-20mg Mild - moderate pain: 5-10mg; Elderly / severe renal or liver disease: start at low dose)	Generally considered the opioid of first choice. Caution in patients with severe renal impairment. May administer as continuous IV or SC infusion.**
HYDROMORPHONE	**1.5 mg**	**4 mg-7.5 mg**	0.5-2mg IV/SC q4h	1-4mg po q4h*	Preferred for patients with renal disease. May administer as continuous IV or SC infusion.**
CODEINE	**120 mg*** ** (given SC or IM not IV)	**200 mg*** ** (not recommended – see comments)	15-60 mg IM/SC q4h	15-60mg q4h*	***Do not use these doses in clinical practice. Doses above 60mg are not usually appropriate due to diminishing incremental analgesia with increasing doses but continually increasing side effects such as nausea and constipation. Ineffective in up to 10% of caucasians who lack the enzyme to metabolize codeine to morphine. Suitable for mild to moderate pain management.
OXYCODONE	Not available	**10-20 mg**	Not available	5-10mg q4h*	Oxycodone immediate release (Oxy IR®) is non-formulary. Oxycodone combination products are formulary.
MEPERIDINE	**75 mg**	**300 mg**	50-75 mg q4h	Not recommended	Not recommended for chronic use. Note: Meperidine is primarily metabolized by the liver to less active or inactive metabolites and excreted renally. Normeperidine, an active metabolite has half the analgesic potency of meperidine but 2-3 times the neurotoxic potential. Normeperidine accumulates in patients with renal impairment and may cause confusion, muscle twitching and seizures. Risk of neurotoxicity increases with doses greater than 600 mg/24 hrs or duration of use greater than 48 hours. Multiple doses contraindicated in elderly or patients with renal insufficiency. Also, multiple doses in patients with predisposition to seizures are contraindicated.
FENTANYL	100 mcg (single dose)	Not available	25-100 mcg q1h (Post-op pain: 10-25 mcg IV q5min prn - cont. monitoring required)	Not available	IV: very short acting May administer as continuous IV administration. Transdermal: Not for acute pain management. See table 2 for initial dosing. DO NOT CUT patch. 12-hr delay onset and offset with patch. Useful for procedures and conscious sedation. Fentanyl also used sublingually for incident pain.**
METHADONE	Not available in Canada	Highly variable.			Variable duration – increases with repeated dosing. Usually administered once daily when used for opioid addiction or divided dosing for analgesia. Requires special authorization (Office of Controlled Substances, Health Environment and Consumer Safety Branch, Ottawa) to prescribe.

***Long-acting** product available (see table 3). **Administration restricted to approved areas – Refer to Pharmacy website

Notes: In some cases, a range is provided. When converting from one opioid to another, or from one route to another, use the conversion ratio which provides the most conservative estimate.

Example: Hydromorphone IV:PO ratio = 1.5 : 4-7.5. This is approximately equal to 1:3 or 1:5.
If converting from oral to IV hydromorphone, use a conversion ratio of 7.5:1.5, i.e. divide oral dose by 5 to get equianalgesic oral dose.
If converting from IV to oral hydromorphone, use a conversion ratio of 1.5:4, ie. multiply IV dose by 3 to get equianalgesic IV dose.

Calculating the equipotent dose: Example: Convert patient from morphine 30mg po q4h to hydromorphone IV.
Step 1: Calculate current total daily usage of opioids.
Morphine 30 mg /dose x 6 doses/day = 180mg/day.

Step 2: Calculate the equipotent dose (consult conversion table).
30 mg morphine po = 1.5 mg hydromorphone IV
180 mg morphine po = *x* hydromorphone IV
x = 1.5 x 180 ÷ 30 *x* = 9 mg
Therefore, 180mg morphine po/day = 9mg hydromorphone IV/day.
Dosing interval is q4h. Therefore, 9 mg/day ÷ 6 doses/day = hydromorphone 1.5 mg IV q4h.

Step 3: When changing a patient's opioid due to side effects or inappropriate route of administration, reduce the calculated dose by 30-50% due to incomplete cross-tolerance among opioids. Also, cut back on the calculated equianalgesic dose if the patient is receiving a very high opioid dose. However, if patient's pain is poorly controlled, it may be preferable to administer the calculated equianalgesic dose rather than cutting back on the daily amount.

Tolerance is common with chronic use of opioids; patient first notices a reduction in adverse effects and a shorter duration of analgesia followed by a reduction in efficacy of each dose. Tolerance can usually be overcome by increasing the dose. Cross-tolerance exists among all opioids but is not complete. Incomplete cross-tolerance implies that patients receiving a particular dose of one opioid may not be able to tolerate the equianalgesic dose of another opioid. Therefore, starting with half of the customary equianalgesic dose is recommended in these situations.
In contrast: "**Addiction**" is psychologic dependence on an opioid for effects other than pain relief. **Patients who take these drugs for acute pain control or cancer pain rarely experience addiction.**

TABLE 2: RECOMMENDED INITIAL DURAGESIC® DOSE BASED UPON DAILY ORAL MORPHINE DOSE

Oral morphine (mg/day)	60-134	135-179	180-224	225-269	270-314	315-359	360-404	405-494	495-584	585-674	675-764	765-854	855-944	945-1034	1035-1124
Fentanyl mcg/h Patch q3d	25	25+12	50	50+12	75	75+12	100	125	150	175	200	225	250	275	300

- Not for acute pain
- Initial dosage may be increased after 3 days, taking into account breakthrough doses of analgesics required the 2nd and 3rd day of initial patch application. For subsequent adjustments, bear in mind that it takes 6 days to reach steady-state after a dosage adjustment

TABLE 3: LONG-ACTING ORAL OPIOID PRODUCT

Generic Name	Dosage Form	Brand Name / Strength	Dosing Frequency	Comments
CODEINE	**Controlled release tablet**	Codeine CONTIN 50, 100, 150, 200 mg	8-12h	Non-formulary. Do NOT crush or chew. Codeine phosphate parenteral and oral formulations contain approximately 75% codeine base. Patients currently receiving oral immediate release (IR) formulation may be transferred to the long-acting product at an approximately 25% lower daily dose, equally divided into q12h.
HYDROMORPHONE	**Controlled release capsules**	Hydromorph CONTIN 3, 6, 12, 18, 24, 30 mg	8-12h	Hydromorph Contin® is on the SMH formulary, but it is **restricted** for use to Pain Service, Medical Oncology and Palliative Care Unit - for patients with established high dosage requirements of hydromorphone for prolonged periods of time. DO NOT crush or chew. May open capsules and sprinkle contents on soft food.
MORPHINE	**Sustained release tablets**	MS CONTIN Ratio-Morphine SR PMS-Morphine sulfate SR 15, 30, 60, 100, 200 mg	8-12h	Formulary. Interchangeable brands. Do NOT crush or chew.
	Sustained release tablet	M.O.S. SR 30, 60 mg	8-12h	Non-formulary. NOT interchangeable with other brands.
	Extended release capsules	M-Eslon 10, 15, 20, 30, 50, 60, 100, 200 mg	8-12h	Non-formulary. NOT interchangeable with other brands. Do NOT crush or chew. May open capsules and mix microgranules with soft food or administer via a feeding tube.
	Sustained release capsules	Kadian 10, 20, 50, 100 mg	12-24h	Non-formulary. NOT interchangeable with other brands. Do NOT crush or chew. May open capsules and sprinkle pellets onto small amount of food.
OXYCODONE	**Controlled release tablet**	OxyCONTIN 10, 20, 40, 80 mg	8-12h	Oxycontin® is on the SMH formulary, but it is **restricted** to Pain Service for use in patients who do not tolerate morphine. (Patients receiving Oxycontin® prior to admission for chronic pain may continue on this medication and do not require a Pain Service consult in this situation). Do NOT split, crush or chew. Do NOT give via feeding tube. Biphasic absorption pattern: Initial prompt release (within 1 hour, followed by a slow release over a 12-hour period.

- *With IM/SC administration, onset usually at 15 min (range 15-30 min) and peak at 30-60 min.)*
- *With PO administration of immediate release products, onset is usually at 30 min (range 15-30 min) and peak at 1h (30-60 min)*
- *With PO administration of long-acting products and methadone, onset is usually at 30 min (range 30-60 min))*