



Brent Ruddock

Chronic pain: switching to an alternate opioid analgesic

Patients receiving opioid analgesic therapy may require a switch to a different opioid for a variety of clinical reasons. These include a lack of efficacy, dose-limiting toxicity, or the need for an alternate route of administration.^{1,2}

The process of converting therapy may be challenging, given the variability in patient response to different agents and the conflicting data with respect to equianalgesic dosing.³ Pharmacists must be prepared to make appropriate recommendations for opioid conversion so that the goals of optimal pain relief and avoidance of intolerable side effects can be achieved.²

Case

Mary is a 58-year-old female with chronic low back pain secondary to a motor vehicle accident three years ago. Her current analgesic regimen consists of long-acting oxycodone

(*OxyContin*) 60 mg twice daily, and oxycodone/acetaminophen 5/325 mg (*Percocet*), one tablet every four hours as needed, which she generally uses once daily. While her pain is reasonably well controlled, she complains of nausea and being tired all the time, which she attributes to the oxycodone. Mary's doctor (Dr. Smith) would like to switch her to hydromorphone, and asks your advice on how to select an appropriate dosing regimen.

Equianalgesic doses

When switching a patient from one opioid analgesic to another, after the new opioid has been chosen (based on patient considerations such as route of administration, possibility of interactions, dosage form, and relative costs¹), determining an appropriate dose for the new opioid is of paramount importance. Dose selection is generally accomplished using published equianalgesic dosing

tables. Unfortunately, data presented in many of these tables are derived from single-dose studies, which may limit their applicability in the scenario of chronic dosing.^{1,3} Table 1 summarizes current information regarding equianalgesic dosing of opioid analgesics, incorporating data from studies of chronic pain management where available.

Dosage calculation

In order to calculate the equianalgesic dose of the new opioid, it is first necessary to determine the total daily dose of the current opioid(s), including both long-acting and breakthrough doses.¹ If the analgesic regimen consists of multiple opioids, the total doses of each should be converted to morphine equivalents (using Table 1), and the values added together to get the total daily dose in morphine equivalents.¹ If the regimen consists of a single opioid only, its total daily dose should also be converted to morphine equivalents.

Once the regimen has been changed to morphine equivalents, this value is used to establish the dose range of the new opioid (the "calculated equianalgesic dose").¹

Dosage individualization

Equianalgesic dosage data should be used as a starting point for estimating the appropriate dose when switching a patient to a new opioid; however, dosage individualization is often necessary to prevent over- or underprescribing.²

Brent Ruddock, BScPhm, is a drug information pharmacist with the Ontario Pharmacists' Association Drug Information and Research Centre.

TABLE 1 — Approximate equianalgesic doses of opioid analgesics^{1,2,4}

Opioid	Approximate equianalgesic dose (mg)	
	Oral	Parenteral
Morphine	30	10
Hydromorphone	7.5	1.5
Oxycodone	20–30	Not applicable
Codeine	200	130
Meperidine*	300	75
Fentanyl†	Not applicable	0.1
Methadone	3–5‡	Not applicable

*Not recommended for chronic pain management due to risk of accumulation of neurotoxic metabolite.

† Transdermal fentanyl dose in µg/hour is approximately one-half the total daily dose of oral morphine (e.g., 100 µg/hour transdermal fentanyl = 200 mg/day oral morphine); consult manufacturer's product monograph for more detailed conversion data.

‡ Reported equianalgesic doses vary widely, depending upon factors such as the dose and duration of previous opioid therapy; higher previous opioid doses generally require more conservative doses of methadone.

Considerations for individualization include:

- The reason for switching (e.g., uncontrolled pain versus unacceptable adverse effects)
- Degree of opioid tolerance (i.e., the need for increased doses to maintain effect with chronic use)
- Patient parameters that increase the likelihood of adverse reactions (e.g., advanced age, significant comorbidities)
- Environmental factors (e.g., availability of a caregiver to monitor patient)^{4,5}

As well, it has been suggested that there may be incomplete cross-tolerance among opioids, which could result in greater effects than expected if equianalgesic dosage data were used as a sole means for approximating dosage.^{2,4}

General recommendations for dosage individualization are summarized in Table 2.

Breakthrough dosing

After approximating the regularly administered dose of the new opioid, it is necessary to determine an appropriate dose of a short-acting opioid for breakthrough or rescue use. Ideally, patients should use the same opioid for both long- and short-acting doses.¹ As a general rule, a breakthrough dose that is 10%-20% of the total daily opioid dose can be recommended at an appropriate interval, depending on the duration of action (every four hours for most short-acting agents).¹

Pharmacist's role

First, it is necessary to determine Mary's total daily opioid use and convert to morphine equivalents. Based on the information provided by Dr. Smith, Mary is using 125 mg of oral oxycodone per day (60 mg twice daily = 120 mg, plus 5 mg once daily). According to Table 1,

TABLE 2 — Recommendations for dosage individualization ^{1,4}	
Scenario	Recommendation*
Therapy being switched due to intolerable side effects or unacceptable route of administration	Reduce the calculated equianalgesic dose of the new opioid by approximately 33%
Therapy being switched due to lack of efficacy	Administer the calculated equianalgesic dose of the new opioid, or in the case of severe pain that significantly affects quality of life, increase the calculated equianalgesic dose of the new opioid by 25%-30% [†]
Therapy being switched in a patient with significant cardiopulmonary, hepatic, or renal disease	Reduce the calculated equianalgesic dose of the new opioid by up to 50% or more, depending on specific drug parameters
*Whenever more than one scenario applies, the more conservative recommendation should be used. †Ensure that a reliable caregiver is available to monitor for adverse effects.	

125 mg of oral oxycodone is approximately equivalent to 187.5 mg of oral morphine (using the conservative estimate that 20 mg oral oxycodone = 30 mg oral morphine).

The next step is to convert the morphine equivalent dose to an appropriate dose of hydromorphone. Using Table 1 again, 187.5 mg of oral morphine can be converted to 46.9 mg of oral hydromorphone.

After calculating the equianalgesic dose of hydromorphone, it should be individualized to Mary's clinical scenario. Given that Mary had achieved reasonable pain control, and is only changing from oxycodone because of adverse effects, a reduction of the calculated equianalgesic dose of approximately 33% would be appropriate as a starting point (see Table 2). Thus, the regular total daily dose of hydromorphone should be about 31.3 mg.

Finally, an appropriate breakthrough dose should be calculated. Based on an estimate of 10%–20% of the total daily opioid dose (i.e., 31.3 mg hydromorphone), each breakthrough dose should be around 3 mg to 6 mg.

Taking the availability of tablet strengths into consideration, a regimen consisting of long-acting hydromorphone (e.g., Hydromorph Contin) 16 mg twice daily, and short-acting hydromorphone 4 mg every four hours as needed, could be recommended for Mary. It is also important to reinforce that Dr. Smith will want to monitor Mary closely during the first two weeks to determine her response to the new regimen.¹ ■

REFERENCES

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