

## *Virtual Mentor*

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### STATE OF THE ART AND SCIENCE

#### How to Change Routes of Administration of Opioids

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Pain management is a critical competency in medicine especially when palliation, and not treating the underlying disease, is the physician's focus. Oftentimes physicians need to change the route of administration of opioid analgesics. For example, a patient may be unable to take oral medication, and may require pain medication parenterally. When changing routes of administration an equianalgesic table is a useful guide for dose selection.

Equianalgesic Doses of Opioid Analgesics		
Oral/Rectal Dose (mg)	Analgesic	Parenteral Dose (mg)
100	Codeine	60
-	Fentanyl	0.1
15	Hydrocodone	-
4	Hydromorphone	1.5
2	Levorphanol	1
150	Meperidine	50
10	Methadone	5
15	Morphine	5
10	Oxycodone	-

- To switch between routes of opioid administration use the equianalgesic information on the horizontal axis. For example, 150 mg meperidine orally per day is equivalent to receiving 50 mg of meperidine intravenously.

- To switch between opioids, use the information on the vertical axis. For example, 10mg of oxycodone orally is equivalent to 50mg of meperidine intravenously.
- Long term opiate use can lead to tolerance which requires increasing the dose of medication to achieve pain control. When switching between opioids, there is the possibility of cross tolerance, which is usually incomplete. A patient may have some tolerance to a new opiate as a result of being on a previous opiate. Therefore, experts suggest that you begin the new opiate between 50 and 75 percent of the equianalgesic dose.

### Quick Case

Mrs. A is receiving adequate pain control on 10mg of oxycodone PO q4h, but is now unable to take medication by mouth. You decide to switch her to meperidine intramuscularly. What dose of meperidine would you prescribe so that she has approximately equal daily amount of analgesia?

### Calculating the Answer:

1. Figure out total daily dose of oxycodone:

$$10\text{mg} \times 6 = 60\text{mg/d PO oxycodone}$$

2. Use equianalgesic table to determine conversion ratio:

$$10 \text{ mg PO oxycodone} = 50 \text{ mg IM meperidine}$$

$$60 \text{ mg/d PO oxycodone} = x \text{ mg/d M meperidine}$$

3. Solve for X

$$X = 300\text{mg/d of IM meperidine}$$

4. Correct for cross tolerance of 70%

$$0.70 \times 300\text{mg/d of IM meperidine} = 210\text{mg/d of IM meperidine}$$

5. Decide on schedule

$$35\text{mg IM q4h of meperidine}$$

Audiey Kao, MD, PhD is the editor in chief of *Virtual Mentor*.

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