FAST FACTS AND CONCEPTS #36
CALCULATING OPIOID DOSE CONVERSIONS
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Introduction
A variety of published conversion tables exist to provide clinicians a rough guide for making calculations when switching between different opioid routes or preparations. Listed below are methods for common conversions using standard published conversion ratios. The examples assume a change in drug or route at a time of stable pain control using equianalgesic doses. See Fast Fact #2 about conversions involving transdermal fentanyl; #75 and #86 about methadone; and #181 about oxymorphone.

Caution: Published values in equianalgesic tables should be considered a rough clinical guide when making dose conversions; substantial inter-individual variation exists. The final prescribed dose needs to take into account a patient’s age, renal, pulmonary and hepatic function; their current pain level and opioid side effects such as sedation; as well as prior and current opioid use.

Opioid Equianalgesic Conversion Ratios for use with the following examples:

Morphine 10 mg parenteral = Morphine 30 mg oral = Hydromorphone 1.5 mg parenteral = Hydromorphone 7.5 mg oral = Hydrocodone 30 mg oral = Oxycodone 20-30 mg oral (see Reference 1).

A. Change route, keeping drug the same (e.g. oral to IV morphine)
Example: Change 90 mg q12 Extended Release Morphine to Morphine by IV continuous infusion

1. Calculate the 24 hour current dose: 90mg q 12 = 180 mg Morphine/24 hours
2. Use the oral to parenteral equianalgesic ratio: 30 mg PO Morphine = 10 mg IV Morphine
3. Calculate new dose using ratios: 180/30 x 10 = 60 mg IV Morphine/24 hours or 2.5 mg/hour infusion
4. Some experts recommend starting the new opioid at 75% of the calculated dose to account for inter-individual variation in first pass clearance.

B. Change drug, keep the same route (e.g. po morphine to po hydromorphone)
There is incomplete cross-tolerance between different opioids, but the exact amount will differ. Thus, equianalgesic tables are only approximations. Depending on age and prior side effects, most experts recommend starting a new opioid at 50% of the calculated equianalgesic dose, in the setting of well-controlled pain.

Example: Change 90 mg q 12 Extended Release Morphine to oral Hydromorphone.

1. Calculate the 24 hour current dose: 90 Q12 x 2 = 180 mg PO Morphine/24 hrs
2. Use the equianalgesic ratio: 30 mg PO Morphine = 7.5 mg PO Hydromorphone
3. Calculate new dose using ratios: 180/30 X 7.5 = 45 mg oral Hydromorphone/24 hours.
4. Reduce dose 50% for cross-tolerance: 45 x 0.5 = 22 mg/24 hours = 4 mg q4h

C. Changing drug and route (e.g. oral morphine to IV hydromorphone)

Example: Change from 90 mg q12 Extended Release Morphine to IV Hydromorphone as a continuous infusion.

1. Calculate the 24 hour current dose: 90 Q12 x 2 = 180 mg PO Morphine/24 hrs
2. Use the equianalgesic ratio of PO to IV morphine: 30 mg po Morphine = 10 mg IV Morphine
3. Calculate new dose using ratios: 180/30 x 10 = 60 mg IV Morphine/24 hours
4. Use the equianalgesic ratio of IV Morphine to IV Hydromorphone: 10 mg Morphine = 1.5 mg Hydromorphone
5. Calculate new dose using ratios: 60/10 x 1.5 = 9 mg IV Hydromorphone/24 hours
6. Reduce dose 50% for cross-tolerance: 9 x 0.5 = 4.5 mg/24 hours = 0.2 mg IV continuous infusion
7. Note: one would also get the same amount of hydromorphone if you directly converted from oral morphine to IV hydromorphone using the 30 mg : 1.5 mg ratio.

References:


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