FAST FACTS AND CONCEPTS #2
CONVERTING TO TRANSDERMAL FENTANYL
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Quick—what dose of the transdermal fentanyl patch (Duragesic®) is equianalgesic to a 3 mg/hr morphine continuous infusion? Conversions to and from fentanyl transdermal are notoriously tricky, requiring knowledge of the published conversion data, general opioid pharmacology, and a generous dose of common sense. See also Fast Fact #36 on opioid dose conversions.

Step 1: Calculate the 24 hr morphine dose: 3 mg/hr x 24 hrs = 72 mg IV morphine/24 hrs.

Step 2: Convert the IV dose to the equianalgesic oral morphine dose using a ratio of: 1 mg IV = 3 mg oral. Thus, 72 mg IV = 216 mg po/24 hours.

Step 3: Convert the oral morphine dose to transdermal fentanyl. There are two methods:

* **Method 1 – Standard Table.** Look up the FDA prescribing information for transdermal fentanyl (Reference 1, pp 29-30). It says that 135-224 mg of morphine per 24 hours = 50 mcg/hr patch. Note: this range of morphine is very broad which may result in significant under-dosing.

* **Method 2 - Alternate Formula.** In 2000, Brietbart, et al published an alternative method, based on the results of a multi-center trial by Donner, et al, that relied on a fixed dose conversion ratio to calculate the fentanyl transdermal dose. Brietbart recommended the ratio of:
  - 2 mg oral morphine/24 hr = 1 mcg/hr of transdermal fentanyl—rounded to the nearest patch size. In the case example above, 216 mg of oral morphine per day is approximately equianalgesic to the 100 mcg/hr fentanyl patch.

Note: using this formula, 25 mcg/hr of transdermal fentanyl is roughly equivalent to 50 mg oral morphine/24 hours. This dose may be excessive when used in the opioid naïve or the elderly.

**Key Considerations**
1. All equianalgesic ratios/formulas are approximations; clinical judgment is needed when making dose or drug conversions.
2. The FDA Prescribing Information indicates that their table should only be used when converting from another opioid to transdermal fentanyl.
3. The risk of sedation/respiratory depression with transdermal fentanyl is probably increased in the elderly or patients with liver and renal impairment due to its long half-life, thus, choose the lower end of the dosing spectrum.
4. When in doubt, go low and slow, using prn breakthrough doses generously while finding the optimal dosage of a long-acting drug.
5. The ‘Alternate Formula’ by Brietbart, et al is best used by experienced practitioners as it tends to give higher fentanyl patch doses than the FDA PI.

**Other teaching points about Duragesic:**
* Start at the lowest dose, 12 mcg/hr, in an opioid naïve patient; there is no maximum dose.
* Therapeutic blood levels are not reached for 13-24 hours after patch application and drug will be continue to be released into the blood for at least 24 hours after patch removal.
* Opioid withdrawal symptoms can occur during dose conversions—care must be taken to avoid this by use of breakthrough opioids.
* Some patients will need to have their patches changed every 48 hours.
* The recommended upward dose titration interval is no more frequently than every 72 hours.
* Place patches on non-irradiated, hairless skin.
* Direct heat applied over the patch can increase drug absorption with increased toxic effects.
• There are no data that cachectic patients have reduced efficacy due to loss of subcutaneous fat; albeit cachectic patients may require higher dosing (6).

References:


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