Pain Management
Fast Facts-5 Minute Inservice

Opioid Titration and Dose Escalation

Opioids are commonly used to manage moderate to severe acute pain. The amount of opioid required to manage pain is known to vary widely due to inter-and intra-individual responses to pain and the available opioid analgesics. Although a number of factors that predict opioid analgesic response have been identified, including age, gender, and ethnicity, no evidence exists to support uniform responsiveness to opioid dosing. It is essential that opioids be started at a low dose and gradually titrated to pain relief with close monitoring of side effects. *These guidelines in this fast fact apply to patients with normal renal and hepatic function. For elderly patients, or those with renal/liver disease, dose escalation percentages may require dose reduction.*

**Oral:**
- Increase the dose until either analgesia or intolerable side effects occur by titrating upwards in increments of 25-100% at subsequent dosing intervals. Peak drug effect occurs within 1 to 1-1/2 hours after oral administration of short-acting opioids. Therefore, it is safe for patients to take a second opioid dose for unrelieved pain 1 to 2 hours after the first dose if side effects are tolerable.
- Sustained-release oral morphine, oxycodone or oxymorphone can be escalated every 24-48 hours.
- When first administered, methadone may have a relatively short analgesic action (4-6 hours) and can be titrated daily (similar to other short-acting PO opioids). After 3-4 days of regular dosing the drug’s terminal half-life can become quite prolonged (90-120 hours) and because it takes 3-5 half-life elimination periods to obtain steady state, further dose increases should be done no more frequently than once every one to two weeks to avoid accumulation and overdose. The dosing interval can sometimes be increased to 8-12 hours. For more detailed information on methadone dosing see: [http://www.aafp.org/afp/20050401/1353.html](http://www.aafp.org/afp/20050401/1353.html)

**Intravenous Infusion:**
1. Give a loading bolus dose at the start and with each increase in basal rate. Administer the loading dose slowly (2mg/min) and observe vital signs frequently after each loading dose;
   a. 100-150% of established starting hourly dose.
   **OR**   b. 0.03mg/kg of morphine or the equivalent dose of a similar opioid every 10 minutes until pain score is diminished by 50% on a numeric or visual analog scale. Then calculate the basal rate as one sixth of the total loading dose given*.
   
   *For example: A patient weighs 80kg. A loading dose of 2.4mg morphine dose (80 x 0.03mg) is administered 4 times doses over ~40 minutes to achieve 50% reduction in their pain rating. The total loading dose is 9.6mg is divided by 6 to calculate a starting basal rate would be 1.6mg/hr.

2. Full effects of initiating or increasing a continuous basal dose (without first administering a loading dose) will not be seen until steady state is reached, approximately 5 half-lives (10-12 hours).
3. For pain that is uncontrolled administer frequent RN bolus doses. Avoid escalating the continuous basal dose more frequently than every 8 hours.
4. When escalating opioid infusions, do not increase basal rate more than 100% at any one time, irrespective of how many bolus/breakthrough doses have been used.
5. When patient controlled boluses are used with a basal dose, the PCA bolus dose should be one-half of the hourly basal rate. The PRN RN bolus is usually 2X the PCA dose or equal to the hourly basal dose. Keep in mind the hourly limit should be set to approximately 3-5 times the projected hourly requirement. For example; at a basal rate of 4 mg of morphine, the PCA bolus could be 2 mg (every 6-10 minutes).

References: