

Equianalgesic Dosing: Making Opioid Interchange Easier

Joseph Bubalo PharmD, BCPS, BCOP

Oncology Clinical Pharmacist

Assistant Professor Of Medicine

Why Change Opioids?

- Side Effects
- Insufficient Pain Management
- Need to Change Route of Administration
- Economics

Interchange Caveats

- Provides a starting point
- Incomplete Cross Tolerance
- Oral Bioavailability
- Morphine Conversion ratio
- Methadone Conversions
- Patients with organ dysfunction

Equianalgesic Interchange

Agent	IM/IV/SQ	Oral
Morphine	10	30(60)
Oxycodone	N/A	30
Hydromorphone	1.5	7.5
Methadone	1-10	2-20
Fentanyl	0.1	N/A-Actiq*
Hydrocodone	N/A	30
Codeine	120	200
Meperidine	75	300

Dosing Basics

- Baseline pain control with dosing timed optimally for the dosage form used, usually sustained action form i.e. Q 12h hours
- Breakthrough dose that is 10% of the 24 hour opioid total or 25-30% of the incremental dose and timed optimally for potential rescue needs, usually Q 2-4 hours

Rules For Conversion

- Figure 24 hour Morphine Equivalent Amount
- Convert to Route and Agent of choice via equianalgesic table
- Reduce dose by 25-30% if Changing agents or going from PO to IV

Rules For Rescue Doses

- Provide rescue amount equal to at least 3 times the hourly dose via PCA
- Oral rescue dose should be approximately 10% of the 24 hour opioid dose or 25-30% of the incremental dose(q 8h or Q 12h) given every 2-4 hours

60 year old female with Cervical Cancer

- Current Medication Regimen

- Fentanyl Patch 150 mcg/hr

- Morphine sulfate (MS)15 mg 8-10 tabs/day

- Vicodin[®] 8-10 tabs/day

- She is having substantial breakthrough pain.

What is the best pain management regimen for her?

Fentanyl Patch Conversions

Delivery in mcg/hr*	24hr Morphine equivalent (PO)	24 hr Morphine Equivalent (IV)
25	45-134(~90)	8-22(~15)
50	135-224(~180)	23-37(~30)
75	225-314(~270)	38-52(~45)
100	315-404(~360)	53-67(~60)

*Multiples of above are used to find the appropriate morphine dose or vice versa

Fentanyl Conversion

- Morphine 15mg X 10 = 150 mg
- Vicodin[®] (5 mg/tab)10 X 5 = 50 mg
- 200 mg PO MS = 50 mcg/hr of fentanyl patch additional(total now 200 mcg/hr)
- Break-through dose needs to be increased accordingly (10% of 24 hour MS equivalent dosed Q 2-4 hours)
- What if MS Contin[®]?

Morphine SR Dose

- 200 mcg /hr fentanyl patch = 720 mg PO MS
- 360 mg PO Q 12 decreased for drug interchange = 300 mg Q12
- Rescue dose = 50-80 mg PO Q 2-4 hours

PO to IV Conversion

- A 70 year old, 115 lb, Asian female is admitted to the hospital for an operative procedure. She has been taking hydromorphone 4 mg every 4 hours and oxycodone 20-30 mg every 3-4 hours as need for breakthrough pain. She will be NPO post-op and we need an IV morphine dose to manage her pain.

Issues to Consider

- Opioid Naive?
- Age > 60
- Low body weight
- What is her average 24 hour use?
- Organ function?
- Length of NPO state?

Conversion

- Hydromorphone $24 \text{ mg}/7.5 \times 10 = 32 \text{ mg}$
IV MS equivalent
- Oxycodone $90 \text{ mg}/30 \times 10 = 30 \text{ mg}$ IV MS
equivalent
- 24 hour total = 62 mg or 2.5 mg MS/hr
- Starting dose?

Method of Delivery

- PCA
- Basal?
- Basal 2 mg with PCA 1-2 mg Q 6-10 min
- Titration parameters

IV to PO Conversion

- Post-op course was uneventful, currently on a basal of 1.5 mg/hr and used 6 mg of breakthrough morphine (All IV) in the last 24 hours
- Convert to MS Contin[®]
- 24 hour total = 42 mg
- $42 \text{ mg}/10 \times 30 = 126 \text{ mg}$

Maintenance Dose and Rescue

- MS Contin[®] 60 mg Q 12 hours vs 40 mg Q 8 hours?
- Rescue dose of 10% of the 24 hour dose or 25-30% of the Maintenance dose
- Always maintain laxatives
- Consider other adjuvants/coanalgesics

70year old man with colon cancer and Abdominal Pain from Ileus

- Currently comfortable on a morphine PCA and used 84 mg in the last 24 hours, with basal dose only used.
- What dose of Fentanyl Patches should be used to prepare him for discharge?

Patient was started on 100 mcg/hr of fentanyl patch

- Patch was applied at 1400 basal was decreased by 12 at 0200 and DC'd at 0800 the next day. Patient was very comfortable with no breakthrough medication required.
- At 1000 the patient has respirations of 4 and is not arousable.
- Naloxone 0.4 mg diluted to 10 ml is given 2 ml Q 3 minutes until respirations are 10 and patient awakens.

What Happened?

- Patient very comfortable with no rescue demands
- Pain had diminished so was no longer stimulating respirations
- Patches titrated on as PCA titrated off disguised decreased analgesic requirement
- Despite recent heavy use of opioids respiratory depression can still occur!!

PRN IV Opioid Equivalents

- Morphine 4 mg
- Hydromorphone 0.5 mg
- Fentanyl 40 mcg
- Meperidine – no longer used

PRN Oral Opioid Equivalents

- Morphine 10-20 mg
- Oxycodone 10-20 mg
- Lortab[®]-5 2-4 tabs
- Lortab[®]-10 1-2 tabs
- Hydromorphone 2-4 mg
- Codeine 60-120 mg

Dosing Basics

- Use Oral agents if possible
- Dose around the clock for constant pain
- Use an immediate release short acting agent for breakthrough pain
- No maximum opioid dose
- Schedule laxative with opioids
- Titrate to effect/side effects

Routes of Administration

- Oral
- Rectal
- Transdermal
- Sublingual/Buccal
- Intramuscular
- Intravenous
- Subcutaneous
- Spinal

Tolerance

- Increasing doses are required to provide the same amount of analgesia
- Rare in cancer patients and chronic pain
- Cancer growth?
- No maximum dose of opioids
- Opioid rotation may help

Dependence

- Abstinence symptoms (vs withdrawal) occur with sudden deprivation of medication
- Occurs with other medications as well ie Beta Blockers, corticosteroids, SSRI, etc
- Requires pre-planning of refills and vacation supplies

Addiction

- Continued use despite harm
- Erratic use and acquisition patterns
- No improvement in quality of life
- Use for other than pain control
- Can still palliate patient
- Pseudo-Addiction – pain derived behaviors that result in specific use patterns but are predictable

PCA Safety Issues

- PCA by proxy
- Patient education
 - For appropriate analgesia
 - To prevent oversedation
- Monitoring
 - Pain, alertness, vitals Q 4H-rate/quality of respirations first 24-48 hours.
- Product selection



"Fleas Navidog"