

Pitfalls in Pain Management: Practical Solutions for Hospitalists

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Topics for Discussion

- Refresher: Opioids & Acute Pain Management
 - Drug selection & dosing
 - Non-opioid adjuncts
 - Patient-controlled analgesia
 - Side effect management
- Pain Management and the Opioid Epidemic
 - Safe and effective prescribing practices
 - Achieving adequate pain relief while minimizing harms

Case 1

A 69yo male with h/o HTN and HLD is admitted to the Internal Medicine service with a hip fracture. You meet him on POD 1 and he is in moderate pain (7/10). He is able to eat and drink. He is opiate naïve. His current pain regimen is Fentanyl 25 mcg IV q4h PRN (left over from PACU orders). He reports the Fentanyl relieves his pain but doesn't last long enough. He has normal liver and kidney function.

Which of the following would be the best change?

- A. Increase the frequency of his IV Fentanyl
- B. Add Tylenol 875mg PO TID and oxycodone IR 5-10mg q4h PRN
- C. Start a Fentanyl PCA
- D. Start oxycodone ER 20mg PO q12h

Acute Pain: Opioid Management

1. Determine the route

- PO if patient can eat/drink and pain is mild-mod
- IV if patient NPO, or for severe pain

2. Choose the drug

- Acute pain = immediate release formulations
- Avoid morphine in renal failure (metabolites)
- Avoid codeine in liver failure and renal failure

Opioids: Dose & Intervals

- Start low and titrate up
- For renal and liver insufficiency, start low and go slow – 30-50% of the usual starting dose
- Dosing intervals should be based on drug half life and expected elimination in the patient (liver/kidney function)

Opioids: Dosing and Intervals

Drug	Starting Dose	Route	Interval	Onset	Peak
Oxycodone	5-10 mg	PO	q3-4h	15m	30-60m
Morphine	15 mg	PO	q3-4h	30m	60m
Hydromorphone	2-4mg	PO	q4-6h	15-30m	30-60m

Drug	Starting Dose	Route	Interval	Onset	Peak
Morphine	2-5 mg	IV	q3-4h	5-10m	20m
Hydromorphone	0.2-1mg	IV	q2-3h	5m	10-20m
Fentanyl	0.3-0.5 mcg/kg	IV	q1-2h	immediate	30m

Back to Case 1

Mr. Payne , a 69yo male with h/o HTN and HLD, is admitted to the Internal Medicine service with a hip fracture. You meet him on POD 1 and he is in moderate pain (7/10). He is able to eat and drink. He is opiate naïve. His current pain regimen is **Fentanyl 25 mcg IV q4h PRN** (left over from PACU orders). He reports the Fentanyl relieves his pain but doesn't last long enough. He has normal liver and kidney function. Which of the following would be the best change?

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- D. ~~Start oxycodone ER 20mg PO q12h~~

Non-Opioid Adjuncts

Adjuncts lead to improved pain control and can spare the patient from opioid side effects

Pain Syndrome	Drug	Comments
Bone/soft tissue	NSAIDs acetaminophen	Caution with NSAIDs in CV disease, bleeding risk
Neuropathic pain	gabapentin, pregabalin duloxetine venlafaxine	
Malignant bone pain	NSAIDs Corticosteroids bisphosphonates	Steroids also effective for solid organ mets
Pain in the elderly	acetaminophen lidoderm patch capsaicin cream diclofenac - topical	

Case 1, continued

You order Tylenol 875mg PO TID and oxycodone IR 5 mg q4h PRN. Mr. Payne takes 5mg of oxycodone at 08:00.

When should you consider a dose adjustment for the oxycodone?

A. 12:00

B. 24 hours after the first dose of oxycodone

C. After he takes at least 5 doses

D. Whenever I round next

Opioids: Titrating the Dose

- Re-assess pain level at next dosing interval
- If pain is still moderate to severe, increase dose by 50-100%
- If pain is mild-moderate, increase dose by at 25-50%
- If patient has sedation, do not uptitrate, even if pain uncontrolled – find another agent and ask for help
- Use nursing orders to help your workflow

Titrate to HCAHPS Score of 10?

- I
- S
- [
- I



Case 2

A 75yo woman with a h/o HTN presents to the ED with nausea, anorexia, 20-lb weight loss and RUQ pain. Symptoms have been present for about a month but recently worsened and now she is feeling weak and lightheaded.

T 37.2 HR 105 BP 115/68 RR 14 97% room air wt 72kg

Gen: chronically ill appearing

HEENT: dry mucous membranes

CV: tachycardic

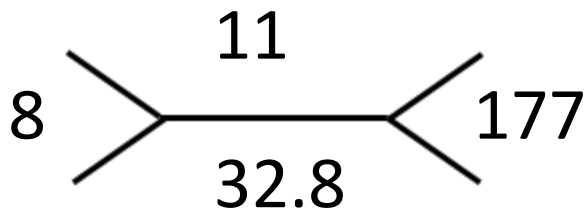
Lungs: CTAB

Abd: soft, TTP in RUQ with firm palpable liver 4cm below costal margin. No rebound

Ext wwp no c/c/e

Case 2

132	104	35
3.1	19	1.7



CT abd/pelvis: innumerable low density mass lesions in the liver consistent with metastatic disease

Case 2

After several doses of IV morphine in the ED the patient remains in significant pain and is unable to eat or drink. She is admitted to Internal Medicine.

What is the best initial pain management strategy?

- A. Morphine 4mg IV q2h PRN
- B. Oxycodone 5mg PO q6h PRN
- C. Hydromorphone PCA
- D. Fentanyl patch + PRN Percocet

Patient-Controlled Analgesia

- Severe, intractable pain
- Oral/transdermal route not available
- Not appropriate for PCA: dementia, delirium, cognitive impairment
- Very low risk of respiratory depression
- Lower pain scores; higher pt satisfaction

Basal
rate

Demand
Dose

Lockout
Interval

4-hour
limit

Loading/
Rescue
Dose

PCA Order Parameters

- Basal rate: opioid tolerant patients only
 - Calculate based on patient's total daily opioid dose
- Demand dose + lockout interval (70kg):
 - Morphine: 0.5-2 mg
 - Hydromorphone 0.1-0.6 mg
 - Fentanyl: 10-25 mcg
 - 5 to 15 minute lockout is standard
- 4-hour limit:
 - Hydromorphone 0.1mg/kg
 - Fentanyl 4 mcg/kg
 - Morphine 0.4 mg/kg
- Loading or Rescue dose:
 - 2x the demand dose
 - Up to 3 doses in 24 hours

PCA Adjustment

- Review PCA use every 24h
- If inadequate pain relief and no sedation:
 - Rule out machine malfunction
 - Increase demand dose by at least 50%
- If very few delivered doses, consider:
 - Does patient know how to use PCA?
 - Are side effects deterring patient from using it?
 - Is the demand dose sufficient?
 - Is PCA still necessary?

PCA Safety: Respiratory Depression

Patient Factors

- Obesity
- Respiratory failure
- Renal failure
- Concurrent use of sedatives (especially benzodiazepines)
- Advanced age
- Head injury
- Family/friends “helping”
 - Pushing button while patient asleep or sedated

Technique/Equipment Factors

- Drug errors
 - Wrong drug
 - Wrong concentration
- Prescribing errors
 - Too much
 - Too soon
- Inappropriate drug selection or dosing
 - E.g. morphine in renal failure
- Programming errors

Bonus Question

Patients can develop tolerance to all of the following opioid side effects EXCEPT:

A. Pruritis

B. Sedation

C. Constipation

D. Nausea/vomiting

The TEN
COMMANDMENTS

1- THE HAND THAT
WRITES THE
SCRIPT FOR
2- OXYCODONE
MUST ALSO
3- WRITE THE
SCRIPT FOR
DOCUSATE +
SENNA

FOR GOD

Opiate-Induced Constipation

- Tolerance never develops!
- Stool softeners alone are insufficient
 - “all mush no push”
- Stimulant laxatives are safe and effective
 - bisacodyl
 - sennosides
- Combination senna + docusate is safe, effective, and easy to titrate (up to 4 tabs TID)

Opiate Side Effects

- Pruritis: tolerance may develop; patient may not itch with different opioid
- Sedation: tolerance within days
- Nausea/vomiting: tolerance within days
- Constipation: tolerance NEVER develops

Managing Opiate Side Effects

Side Effect	Intervention	Notes
Nausea/ Vomiting	Metoclopramide 5 mg PO or IV q4-6h Haloperidol 0.5mg PO q4h	Zofran not as effective
Pruritis	Diphenhydramine Emollients Naloxone infusion for intractable symptoms	Switch opioids
Sedation	Reduce opioid dose Methylphenidate for chronic opioid users	
Constipation	Senna + docusate 1-2 tabs BID PLUS polyethylene glycol 17g daily PRN	Tolerance never develops!

Case 3

A 52yo male with a history of chronic back pain presents to the emergency department with acute low back pain after working in the yard. Pain is sharp and radiates down the left leg. He has no neurological deficits but is unable to ambulate due to severe pain. MRI shows mild disc protrusion at L1-2. His usual pain regimen is not sufficient for pain relief, so he is admitted for pain control.

Case 3

Home Medications

MS Contin 30mg PO q8h

Gabapentin 600mg PO TID

Acetaminophen 975 TID

Senna+colace 2 tabs PO BID

Case 3

Which of the following is the best initial strategy for pain control?

- A. Continue MS Contin 30mg PO q8h and add morphine IR 10mg PO q4h PRN
- B. Start a morphine PCA
- C. Consider epidural steroid injection
- D. Either A or B

Acute on Chronic Pain

1. Calculate total daily dose (TDD) of opioid and convert to oral morphine equivalents (OME)
2. Continue extended release opioid at home dose
3. Add immediate release opioid
10% of total daily OMEs given q4h PRN

MS Contin 30mg PO q8h = 90mg in 24h

$90\text{mg} \times 0.10 = 9\text{mg}$

or ~10mg morphine IR PO q4h PRN

Calculating morphine milligram equivalents (MME)

OPIOID (doses in mg/day except where noted)	CONVERSION FACTOR
Codeine	0.15
Fentanyl transdermal (in mcg/hr)	2.4
Hydrocodone	1
Hydromorphone	4
Methadone	
1-20 mg/day	4
21-40 mg/day	8
41-60 mg/day	10
≥ 61-80 mg/day	12
Morphine	1
Oxycodone	1.5
Oxymorphone	3

Equianalgesic Dosing

Drug	IV	PO
morphine	10mg	30mg
hydromorphone	1.5mg	7.5mg
oxycodone	N/A	20mg

Decrease the dose by 25% if changing from one opioid to another to account for incomplete cross-tolerance

PCAs in Acute on Chronic Pain

Using a basal rate / continuous infusion:

1. Calculate patient's TDD of opioid (ER + IR forms)
2. Convert to IV form
3. Reduce by 25% to account for differences in first-pass metabolism
4. Divide by 24 for the hourly basal infusion rate

PCAs in Acute on Chronic Pain

Using a basal rate / continuous infusion:

Ex: MS Contin 30mg PO q8h

1. Calculate patient's TDD of opioid ($30 \times 3 = 90\text{mg}$)
2. Convert to IV form ($90\text{mg} / 3 = 30\text{mg}$)
3. Reduce by 25%: ($30\text{mg} \times 0.75 = 22.5\text{mg}$)
4. Divide by 24 for the hourly basal infusion rate
 $22.5\text{mg} / 24\text{h} = 0.93\text{mg/h}$

PCAs in Acute on Chronic Pain

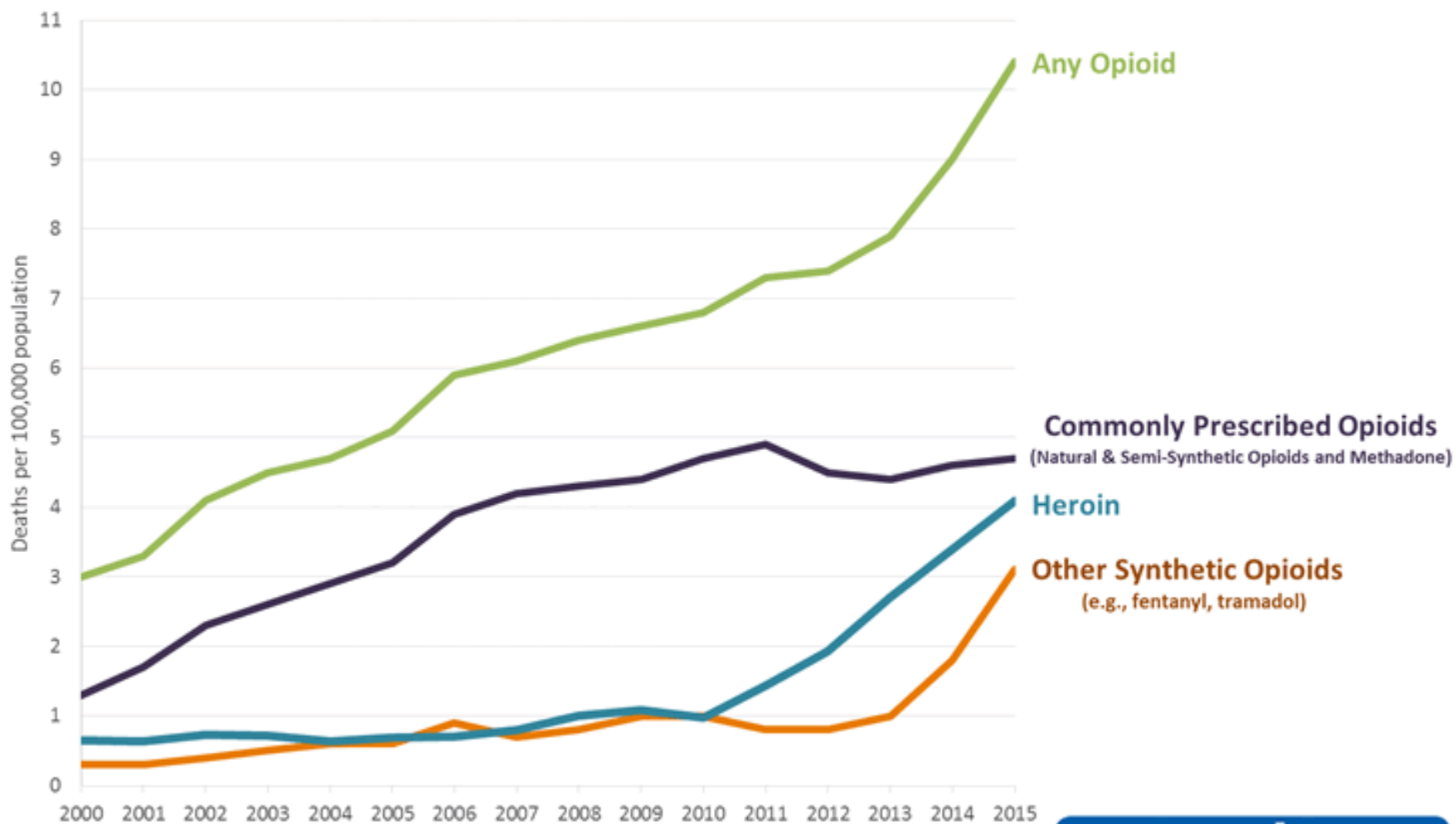
Without a basal rate:

1. Continue long-acting oral opioid at home dose
2. Demand dose should be 50% of the hourly basal rate as calculated using steps 1-4 above (~0.5mg)

The Pain Paradox

- Uncontrolled pain linked to anxiety, depression in hospitalized patients
- Chronic pain may cost up to \$300 billion annually
- Opioid Rx's have increased dramatically since 1990s
 - Avg. sale of 74 mg per person in 1997 to 369 mg per person in 2007
- Americans (4.6% of the world's population) consume 99% of the world's hydrocodone and 80% of all global opioids
- 72% increase in hospitalizations for opioid abuse/overdose from 2002 – 2012

Overdose Deaths Involving Opioids, United States, 2000-2015



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2016. <https://wonder.cdc.gov/>.

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Hospitalists and Opioid Prescribing

- Qualitative study of hospitalists' perspectives on prescribing opioids
- Setting: 1 University hospital, 1 VA hospital, 2 private hospitals, 1 safety-net hospital in CO and SC
- Methods: open-ended interviews with 25 hospitalists

Themes/Topics Identified

- Physician burnout leads to lack of empathy and undertreatment of pain
- Unreal expectations by patients to have complete pain eradication contributes to overprescribing
- Recognition that patient profiling impacts personal opioid-prescribing practices
- Unintended consequences of patient-perceived pain control metrics and opioid prescribing
- The use of opioids to improve efficiency

Using Opioids to Improve Efficiency

“There is always the group of patients [for whom] we've done everything we can. We set up follow-up. If giving you a few days of Percocet is going to help you leave the hospital comfortably and stay out of the hospital for appropriate reasons, then we give them a few days. It's horrible but...”

Using Opioids to Improve Efficiency

“I think physicians overprescribe opioids because we don't want people to bounce back to the hospital. We don't want them to have acute pain at home and have to go back to the ER to be readmitted...”

Challenges of Treating Chronic Pain

“I have a hard time feeling like I'm very successful with people who have chronic noncancer pain who come in for an exacerbation. Unless I can figure out clear reasons for that exacerbation, I feel I rarely succeed in having the patient, the providers, and the caregivers be happy. It is an unrewarding situation all around.”

Challenges of Treating Chronic Pain

“I had a young woman who came in with chronic abdominal pain. She told me how much opioids she took. It was before there was a statewide database and I couldn't verify her doses. I gave her what she told me she was taking....Later the nurse called and said she wasn't responsive. I put her on pulse ox and she was satting 30% and blue. A code was called and we brought her back. That was in my mind for ever, I almost killed a 23 year old.”

Patients with Chronic Pain

- Manage expectations
 - Goal is not pain score = 0
 - “How can we work together to maximize your function?”
- Evaluate for risks/harms
 - Opioid hyperalgesia
- Urine drug screen can be useful but interpret with caution
- Communicate with outpatient prescriber if able

Assess & Mitigate Risk

- Review prescription drug monitoring data
 - Confirm opioid doses and assess for “doctor shopping” or other irregular behavior
 - Call pharmacy and/or provider’s office to verify dose and fill history
- Avoid prescribing opioids and benzodiazepines together when possible
- Consider naloxone for those at especially high risk of overdose
 - Comorbid depression, anxiety, personal hx of substance abuse, concurrent benzodiazepines, OME > 50mg

How Can We Help?

Long-term opioid use begins with acute pain!

1. Maximize non-opioid therapies
2. Use the lowest effective dose of opioid
3. Use immediate release forms
4. Prescribe a short course (1-3 days is usually sufficient) for acute pain; >7d rarely needed
5. Arrange close follow up for reassessment
6. Standardize these strategies in your group

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