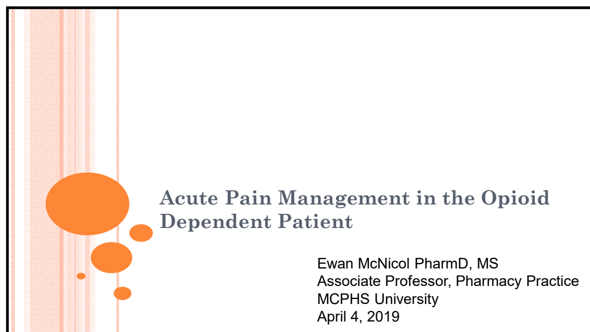
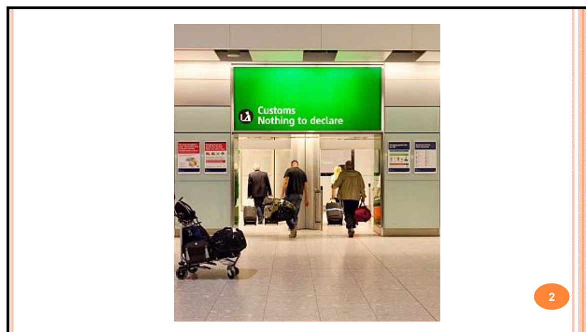




Objectives

- Outline principles for management of acute pain, with focus on perioperative and trauma pain
- Evaluate the evidence supporting, and describe the clinical application of, multimodal analgesia
- With the help of a patient case, explain approaches to tailoring regimens to patients from high risk populations
- Briefly describe changes in institutional practice that incorporate current evidence

2

Patient Presentation

"VS" 32 yo Caucasian M

- Admitted to trauma service post MVA
- Multiple injuries – risk of internal bleeding
- Scheduled for fracture fixation in the OR
- Despite multiple doses of opioid, continues to report 9/10 pain

3

Summary of H&P

- **PMH:** IV heroin abuse
- **MED**:
  - *Home*
  - Methadone 28 mg po once daily
  - *Inpatient*
  - Hydromorphone PCA: PCA dose = 0.2 mg; lockout interval = 8 minutes; 4-hr limit = 6 mg.
- **VS:** T 36.4 C, HR 88, BP: 138/63, RR: 16, O_2 sats room air: 96%, ht: 183 cm, wt: 102 kg, IBW: 77.6 kg, BMI: 29.9 kg/m^2, Pain: 9/10 (generalized), eCrCl: > 120 ml/min
- **LABS:**
  - RBC 4.37 (4.2-5.9 x10^6/uL)
  - Hgb 12.5 (14-17 g/dL)
  - Hct 36.6% (42- 52%)
  - Plt 172 (150-350 x10^3/uL)

5

Why is Acute Pain Management Important?

- Ethical need to treat pain
- Avoidance of short-term adverse events
  - Hyperglycemia
  - Cardiovascular complications
  - Pneumonia
- Risk of persistent post-surgical pain (PPSP)

6

© 2019 Massachusetts Pain Initiative

Quiz Question 1

- Which of the following is a potential consequence of unrelieved acute pain?

A. Increased gastric and bowel motility
B. Elevated immune response
C. Hypoglycemia
D. Respiratory and cardiac complications

7

"High Risk" Patients

- Growing number of opioid-dependent patients
  - Chronic pain and/or opioid maintenance
  - Prescribed and non-prescribed opioids
- Maintenance: methadone vs. buprenorphine/naloxone (Suboxone®)
- Abstinence: naltrexone
- *(patients with use disorders with no acute pain)*

8

Intersection of Pain, Mental Illness and SUD

https://www.slideshare.net/OPUNITE/rx16-tpp-tues3301gavin2saddy3gastfriend

9

General Principles for Acute Pain Management

- Guidelines recommend multimodal pharmacological/non-pharmacological approach[1,2]
- Regimens may vary by patient and surgery or condition

10

Principles for Acute Pain Management *in Opioid Dependent Patients*

- Almost no evidence in this population[1-5]
- Differentiate between physical and psychological dependence, but care may be similar
- May have lower pain thresholds
- Maintain uninterrupted therapy
  - Not the time for detoxification
  - Prevent withdrawal

11

Principles for Acute Pain Management *in Opioid Dependent Patients*

- Multimodal and nonpharmacological therapy[1,2]
- Interprofessional collaboration
- Reassure and involve patient
- Avoid mixed agonist-antagonists[3]
- Will need higher doses of opioid than naïve pts *in addition to* maintenance dose

12

© 2019 Massachusetts Pain Initiative

Quiz question 2

- General principles for acute pain management in opioid tolerant patients include all of the following ***except*?**

A. Involving the patient in the plan of care
B. Employing multimodal analgesic regimens
C. Administering the patient's baseline opioid in addition to as needed opioids
D. Using partial opioid agonists or mixed agonist-antagonists to reduce the risk of adverse events

13

Components of multimodal regimens

- Opioids
- Nonopioids
  - NSAIDs
    - Traditional and coxibs
  - Acetaminophen
- Adjuncts
  - Ketamine, lidocaine, magnesium, gabapentinoids, clonidine, etc.

14

Opioids

- Still considered cornerstone for acute severe pain
  - Multiple adverse effects/safety concerns
  - May not be necessary in all patients[1]

15

Opioids

- Common themes in opioid tolerant patients[3]
  - The maintenance opioid agonist provides only limited analgesia
  - Risks for addiction relapse with both opioid administration and poorly managed pain
  - Opioid analgesic + opioid maintenance = ↑ respiratory and CNS depression?
  - Reporting pain a sign of drug-seeking?

16

Opioids: methadone patients[3]

- Confirm dose with clinic
- Long and variable half life
- OK to prescribe without special DEA addiction license

2 options:

1. Continue and add prn opioids
   - Can split daily dose to provide some analgesia
   - If converting to parenteral, half to two-thirds of oral dose
2. Convert to short-acting opioids

17

Opioids: buprenorphine patients[3]

- Partial agonist at mu receptor with high affinity
- Long terminal half-life (~ 28 hours)
- Confirm dose with PCP, Dr. First, Mass PMP

2 options:

1. Continue and add prn opioids[2]
   - Can split daily dose to provide some analgesia
2. Convert to other opioid
   - If methadone: 20-40 mg daily

18

© 2019 Massachusetts Pain Initiative

Opioids: (Pre)admission and Preoperative

- Preoperative visit (if elective)
  - Discuss patient concerns and set realistic goals
- Tox screens on admission
  - opioids *plus* alcohol, benzos, THC, etc.
- Surgery:
  - *Elective:* administer daily maintenance/baseline opioid dose on morning of surgery
    - Keep fentanyl patch on?
  - *Emergent:* calculate opioid dose requirement and load with IV opioid

19

Opioids: Intra- and Postoperative

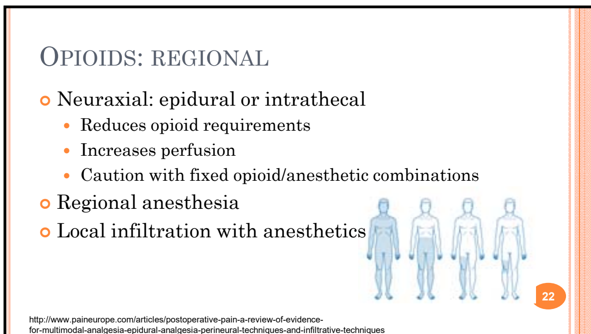
- Increase intraoperative and postoperative opioid dose 20-50%
- Maintain baseline opioids postoperatively
  - If oral, may have to convert to parenteral equivalent.

20

Opioids: Systemic Administration

- Patient request
- Patient controlled analgesia (PCA)[1,3]
  - Higher loading dose, bolus and 4 h limit in opioid tolerant
  - Baseline infusion = daily maintenance dose
    - Equianalgesic conversion – adjust for incomplete cross tolerance
    - Heroin users?

21



Opioids: Regional

- Neuraxial: epidural or intrathecal
  - Reduces opioid requirements
  - Increases perfusion
  - Caution with fixed opioid/anesthetic combinations
- Regional anesthesia
- Local infiltration with anesthetics

http://www.paineurope.com/articles/postoperative-pain-a-review-of-evidence-for-multimodal-analgesia-epidural-analgesia-perineural-techniques-and-infiltrative-techniques

22

Opioids: Discharge[3]

- Maintenance
  - If converted to another opioid, restart maintenance opioid
  - Reduce opioid dose gradually down to baseline
- Chronic pain
  - If surgery provides complete pain relief, opioids should be slowly tapered
    - 50% on first day, 25% thereafter
- Outpatient visit with patient's addiction specialist or pain clinic follow-up, respectively (or both)

23

Quiz Question 3

- Which of the following is true in patients who are opioid tolerant?

A. Regional anesthetic and analgesic interventions are effective treatment options
B. All have abuse or misuse issues
C. "Maintenance" opioids cannot be prescribed during an inpatient stay without a special license
D. They typically have higher pain thresholds than opioid naïve patients

24

Nonopioids: NSAIDs

- Recommended (+ acetaminophen) in patients with no contraindications[1,2]
- DC preoperatively?
  - Celecoxib 200-400 mg recommended pre-op, 200 mg bid postop[1]
- Parenteral options: ketorolac (diclofenac, ibuprofen)
  - Ketorolac reduces opioid-induced AEs[6]

25

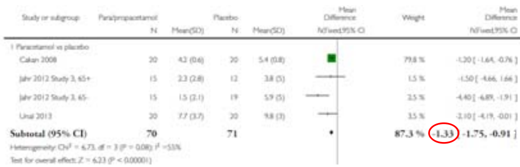
Nonopioids: NSAIDs

- AEs[1]
  - Bleeding, esp GI
  - Renal
  - Cardiovascular
    - Contraindicated post CABG
  - Bone non-union?
  - Anastomotic leak in intestinal surgery?

26

Nonopioids: Acetaminophen

- 500-1000 mg po or iv q6h
- IV reduces opioid requirements
  - Expensive, not superior to po[1,7]



Study or subgroup	Para/propacetamol N	Mean(SD)	Placebo N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 Paracetamol vs placebo							
Cakan 2008	20	4.2 (0.6)	20	5.4 (0.8)		79.8 %	-1.20 [-1.64, -0.76]
Jahr 2012 Study 3, 65+	15	2.3 (2.8)	12	3.8 (5)		1.5 %	-1.50 [-4.66, 1.66]
Jahr 2012 Study 3, 65-	15	1.5 (2.1)	19	5.9 (5)		2.5 %	-4.40 [-6.89, -1.91]
Unal 2013	20	7.7 (3.7)	20	9.8 (3)		3.5 %	-2.10 [-4.19, -0.01]
Subtotal (95% CI)	**70**		**71**			**87.3 %**	**-1.33 [-1.75, -0.91]**

Heterogeneity: $Chi^2 = 6.73$, df = 3 (P = 0.08); I^2 =55%
Test for overall effect: Z = 6.23 (P < 0.00001)

Adjuncts: Gabapentinoids

- Gabapentin and pregabalin
- Recommended in opioid-tolerant[1]
- Only available orally
  - Gabapentin 600 mg one time pre-op; 300 mg post-op (single or multiple doses)
- Mixed efficacy data: opioid sparing↓ pain[8]
- Good safety profile

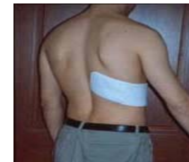
28

Adjuncts: Ketamine

- Often reserved for high risk patients[1]
- NMDA antagonist
- Subanesthetic doses
  - 0.5 mg/kg preop; then 0.1 mg/kg/h
- Reduces pain and opioid requirements; may reduce PPSP[9,10]
- Hallucinations, nightmares: may pre-treat with benzodiazepine
- Controlled substance (C-III)

29

Adjuncts: Lidocaine



- Patch
  - Can be cut to size
  - 12 h on, 12 h off
  - Very limited data for acute pain[11]
- Infusion
  - Efficacy in abdominal surgery[1]
  - Induction dose of 1.5 mg/kg; then 2 mg/kg/h intraop
  - DC on unit/floor

30

© 2019 Massachusetts Pain Initiative

Our Patient: Pharmacy Recs

- Continue methadone (7 mg bid if IV) and increase PCA dose
- Recommended ketamine infusion ± lidocaine patch ± oral acetaminophen ± gabapentin
- If NSAID prescribed:
  - Consider celecoxib if oral tolerated
  - Hold for 24 h before surgery.
  - DC postop if epidural/intrathecal placed?[2]

27

Our Patient: Pharmacy Recs

- Monitor: sedation, respiratory rate, oxygen saturation, other opioid-induced AEs
- Add bowel regimen, prn meds for nausea, itch
- Monitor platelets (DC NSAID if < 75K) and signs of bleeding
- Monitor BUN/serum creatinine

Ultimately, the decision was made to postpone surgery.

28

Developing Guidelines and Policy: Ambulatory

- Refer before elective surgery
  - Consult with patient; agree on plan
    - Stopping or continuing analgesics
    - What to expect and advocate for postop
  - Communicate plan with inpatient team
  - Follow up with patient post-discharge
- If outpatient only, follow similar principles to inpatient

33

Developing Guidelines and Policy: Inpatient

- Algorithm for opioid-dependent patients based on:
  - Acute pain complaint?
  - Chronic opioid use or misuse?
    - If misuse, is patient in opioid maintenance program?
      - If not, does patient wish to enroll in program?
- Standing naloxone orders with discharge opioid prescriptions

34

Inpatient Treatment Guideline Example

35

Summary

- Opioid dependent patients tend to have lower pain thresholds
- Multimodal analgesia is key:
  - Opioid: maintain baseline dose and expect to give higher doses of additional opioid
    - Consider PCA, neuraxial and local analgesia
  - Nonopioids and adjuncts have varying efficacy
- Individualize care before, during and after surgery or event

36

© 2019 Massachusetts Pain Initiative

References

1. Chou R, Gordon DB, de Leon-Casasola OA, et al. Management of postoperative pain: A clinical practice guideline from the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council. *J Pain 2016; 17: 131-57.*
2. Schug SA, Palmer GM, Scott DA, Halliwell R, Trinca J; APM:SE Working Group of the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (2015), Acute Pain Management: Scientific Evidence (4th edition), ANZCA & FPM, Melbourne.
3. Alford DP, Compton P, Samet JH. Acute pain management for patients receiving maintenance methadone or buprenorphine therapy. *Ann Intern Med 2006; 144(2): 127–34.*
4. Mitra S, Sinatra RS (2004) Perioperative management of acute pain in the opioid-dependent patient. *Anesthesiology 101(1): 212–27.*
5. Swenson JD. Postoperative care of the chronic opioid-consuming patient. *Anesthesiology Clin N Am 2005;23:109-23.*
6. Cepeda MS, Carr DB, Miranda N, Diaz A, Silva C, Morales O. Comparison of Morphine, Ketorolac, and Their Combination for Postoperative Pain: Results from a Large, Randomized, Double-blind Trial. *J Amer Soc Anesthesiologists. 2005 Dec 1;103(6):1225-32.*
7. McNicol ED, Ferguson MC, Haroutounian S, Carr DB, Schumann R. Single dose intravenous paracetamol or intravenous propacetamol for postoperative pain. *Cochrane Database Syst Rev 2016, Issue 5. Art. No.: CD007126.*
8. Straube S, Derry S,Moore RA,Wiffen PJ,McQuay HJ. Single dose oral gabapentin for established acute postoperative pain in adults. *Cochrane Database Syst Rev 2010, Issue 5. Art. No.: CD008183.*
9. Bell RF, Dahl JB, Moore RA, Kalso EA. Perioperative ketamine for acute postoperative pain. *Cochrane Database Syst Rev 2006; Issue 1: CD004603.*
10. McNicol ED, Schumann R, Haroutiunian S. A systematic review and meta-analysis of ketamine for the prevention of persistent post surgical pain. *Acta Anaesthesiol Scand 2014; 58:1199–1213.*
11. Bai Y, Miller T, Tan M, Law LS, Gan TJ. Lidocaine patch for acute pain management: a meta-analysis of prospective controlled trials. *Current Medical Res Opin 2015; 31(3):575-81.*

30

Thank you!! Questions?

?????

31