Post-Operative Pain: The role of patient expectations, pre-operative counseling, and non-opioid treatment options

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Post-operative pain

• Introduction and scope of problem

• Multi-modal analgesia
  • Regional and/or local
  • Acetaminophen
  • NSAIDs
  • Gabapentinoid agents

• Prescribing Guidelines

• Patient Education

• Concluding thoughts and questions
Opioid Epidemic

- United States Opioid problem
  - Estimated to consume 80% of world’s narcotics, 99% of hydrocodone [Manchikati et al.]

- Increase in prescribing since the 1990s
  - Focus on pain as a “vital sign”
  - American Pain Society and Agency for Healthcare Research and Quality
  - Increased number of formulations and advertising
Controlling post-op pain

• Patients need adequate pain control.
  • Reduce suffering
  • Allow early mobilization
  • Improve function

• Opioids are effective for acute pain
  • Side effects
  • Addiction
  • Overdose
  • Diversion
  • Transition to illicit opiates
Multi-modal analgesia

• Using medications of different classes, mechanisms of action, and routes of administration

• Treat pain at various points in pain transmission pathway

• Decrease need for opioids peri-operatively

• Provide options for patients who are opioid intolerant

• Promote early mobilization
Regional blocks

- Use of local anesthetic to provide pain relief

- Regional blockade – inject anesthetic near nerve
  - Block sensory distributions to decrease painful stimuli
  - Can have motor blockade

- Total knee arthroplasty patients receiving adductor canal block
  - Decreased morphine consumption, improved pain control, improved functional testing

- Fascia Iliaca Block for hip fractures
  - Decreased pain, decreased morphine consumption (Foss et al)
Local Infiltration

- Inject local anesthetic in the area of operation
- Cocktails of medication including: Local anesthetic, NSAIDs, morphine, epinephrine
- Decreased opioid use compared to placebo
- Potential benefits involving length of stay and function (Jiang et al)
Acetaminophen

• Widely used analgesic and anti-pyretic
• Decrease overall narcotic use in hip and knee arthroplasty (Sinatra et al.)
• IV versus oral formulation (Jibril et al.)
• Relatively safe in healthy adults
  • Acute overdose in high doses
    • Combined formulations with opioids
    • Caution in patients with hepatic disease or chronic alcohol use
Non-steroidal Anti-Inflammatories

• Inhibit COX enzymes which mediate inflammatory response
• Immediate post operative use of Toradol decreases morphine requirements
• Oral NSAIDs can decrease narcotic consumption, improve pain scores
  • Six weeks of use following total knee arthroplasty (Schroer et al)
  • Comparable analgesic effect to Norco after ambulatory procedures (Gimbel et al)
Adverse effects of NSAIDs

• Potential adverse effects
  • GI – including ulcers and bleeding
  • Renal injury in large doses

• Selective versus non-selective
  • Selective COX-2 inhibitors can have decreased side effect
  • Theoretical increased thrombosis and myocardial infarction
    • Large studies show no difference in adverse cardiovascular events comparing celecoxib to control and non-selective NSAIDs (White et al.)
  • Interference of bone and soft tissue healing?
Gabapentinoid Drugs

• Typically used for neuropathic-type pain
• Act on central nervous system
• Patients receiving gabapentin peri-operatively show decreased opioid consumption, nausea, and pruritic after total knee arthroplasty (Zhai et al.)
• Similar results in spinal surgery (Marquez-Lara et al.)
• Central mechanism of action means sedation can be an adverse effect
Multi-modal analgesia

• Addressing pain from different avenues can improve pain control
  • Regional blocks
  • Local infiltration
  • Acetaminophen
  • NSAIDs
  • Gabapentinoids

• Decreased need for opioids can reduce the associated adverse effects and potential for misuse

• Tailor regimen for individual patients to reduce suffering, maximize function, minimize side effects
Prescribing of Opioids

• CDC provides guidelines related to opioid prescription for acute pain:
  • Lowest effective dose of immediate acting opioid
  • Caution with >50 MME/day, use longer than 1-4 weeks

• Guidelines and protocols – Recommendations not mandates
  • Typically approached with hesitation
  • “Setting expectations of the use of opioids with a “pain management protocol” undermines shared decision-making and creates the specter of paternalism and coercion when introduced in the postoperative period. I am unaware of any evidence that pain protocols successfully reduce the incidence of narcotic dependence. In addition, adherence to a pain protocol violates the trust necessary for a successful outcome and may lead to patient abandonment if the pain management problem is not resolved.” – Response to The Opioid Epidemic – Impact on Orthopedic Surgery (JAAOS 2015)
Prescribing Practices

• Sabatino et al. tracked prescribing for total hip/knee arthroplasty, rotator cuff repair, carpal tunnel release, lumbar surgery
  • Wide variety of prescribing for similar procedures
  • 61% reported unused opioid pills

• Significant variation and over-prescribing in other fields including general surgery and urology (Thiels et al, Bates et al.)

• Using inpatient usage to predict outpatient need has pitfalls as well (Chen et al.)
Disposal of excess opioids

Sabatino et al. 
JBJS Feb. 2017
Guidelines

• Thiels et al. developed guidelines for 25 common surgical procedures
  • Categorized high and low opioid dosing tiers based on pre-operative narcotic use
  • Focus on maximum recommendations
  • Decreased narcotic prescribing, patient satisfaction remained similar

• Earp et al. focused on common upper extremity procedures
  • Decrease in opioids prescribed without increase in number of refills written

• Effect on patient satisfaction
  • Hospital survey data: satisfaction related to overall rating, pain medication, nor communication regarding medication was not associated with opioid consumption after knee surgery (Etcheson et al.)

• Is it the guidelines or the improved prescriber education?
  • Spillover effect to procedures not included in guidelines (Howard et al)
<table>
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<tr>
<th>Procedure</th>
<th>NSAIDS/Acetaminophen Only</th>
<th>NSAIDS/Acetaminophen Only</th>
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<tr>
<td>Bronchoscopy or Upper Endoscopy (±Dilation)</td>
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<td>Percutaneous Endovascular or Vascular Access Procedures (Cut-downs, Complex Endovascular, and AV Superficialization may require additional opioids)</td>
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<td>Carotid Endarterectomy</td>
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<td>10 Tabs Tramadol</td>
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<td>Thyroid/Parathyroid Surgery, Mediastinoscopy, or POEM</td>
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<td>8 Tabs Oxycodone</td>
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<td>VATS Procedure (Pulmonary or Mediastinal)</td>
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<td>15 Tabs Tramadol</td>
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<tr>
<td>Thoracotomy (Pulmonary, Pleural, or Chest Wall)</td>
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**Factors Shown to Influence Opioid Usage After Discharge**
- Opioid Naive
- Older Age, Lower BMI, Longer LOS
- Lower Pain Score at Discharge
- Low In-hospital Opioid Use
- Pre-operative Opioid Users
- Younger Age
- Higher Pain Score at Discharge
- High In-hospital Opioid Use

**Clinical judgment and division level guidelines should supersede these recommendations as indicated.**
**Tier 1:** 5 pills (37.5 MME)
- Carpal tunnel release
- Trigger finger release
- DeQuervain's release
- Ganglion/mucous cyst excision

**Tier 2:** 10 pills (75 MME)
- Cubital tunnel in situ release

**Tier 3:** 20 pills (150 MME)
- Closed reduction pinning metacarpal/phalanx
- Extensor/flexor tendon repairs
- Tenolysis; Lateral epicondylitis
- Cubital tunnel release with transposition

**Tier 4:** 30 pills (225 MME)
- Distal radius open reduction internal fixation (ORIF)
- Finger/Carpometacarpal arthroplasty; Darrach procedure
- Elbow arthroscopy; Shoulder arthroscopy without repairs

**Tier 5:** 40 pills (300 MME)
- Shoulder arthroscopy with rotator cuff/labral repair; Elbow/Shoulder ORIF
- Wrist full/limited fusion; Elbow arthroplasty
How much to prescribe?

• Some evidence to guide prescribing
  • Median consumption of 7 hydrocodone 5 mg tabs after knee arthroscopy (Wojahn et al.)
  • Carpal tunnel release patients use 10 pills of either oxycodone, acetaminophen, or ibuprofen with similar pain scores and usage (Ilyas et al.)
  • Expert opinion and institutional consensus is a good starting point
Patient Factors

• Prior Opioid Use

• Risk factors for misuse or dependence
  • Depression
  • History of misuse
  • Sex-based differences
Patient Education

• Responsible prescribing practices are important, however, patient education is crucial.

• Patients experience pain differently
  • Cultural perceptions (Carragee et al.)
    • 25 patients with femoral shaft fractures in Vietnam and United States
    • 0.9 mg/kg morphine equivalents per day versus 30.2 mg/kg
    • 8% felt pain control inadequate versus 80% in US group
  • Patient expectations matter
• Sex-based differences
• Anxiety sensitivity and Depression (Hina et al., Aceto et al.)
Does patient education work?

• Simple interventions can have an impact:
  • 2-minute video describing adverse effects and risks associated with narcotics (Syed et al.)
    • Patients with pre-operative use 6.8x as likely to cease use in post-op period after rotator cuff surgery
    • Decreased opioid consumption and shorter time to cessation
  • Memory prompt card for prescribers for discussion of misuse and diversion and to set expectation of cessation of opioid use post operatively (Stanek et al.)
    • Decreased prescription refill requests after hand surgery
  • Standardized patient instructions to start with non-opioid medications after breast surgery (Lee et al)
    • Decreased prescribing due to new guidelines
    • No increase in refill requests despite this
Involving patients in the process

• Simply decreasing the amount of opioid prescribed is not enough

• Orthopedic trauma and arthroplasty patients have demonstrated multiple provider episodes for narcotics at rates up to 20% (Morris et al., Nickel et al.)
  • Majority of patients with multiple provider encounters are female (K-TRACS)
  • Diversion concerns
  • Unaddressed concerns regarding pain
  • Unrealistic expectations of pain relief
Females account for almost two-thirds of MPE rates

Age-adjusted MPE Rate per 100,000 Population

Jan-Jun 2011: Female MPE Patients = 51.2, Male MPE Patients = 23.7
Jan-Jun 2012: Female MPE Patients = 51.2, Male MPE Patients = 23.7
Jan-Jun 2013: Female MPE Patients = 51.2, Male MPE Patients = 23.7
Jan-Jun 2014: Female MPE Patients = 51.2, Male MPE Patients = 23.7
Jan-Jun 2015: Female MPE Patients = 63.4, Male MPE Patients = 28.4

Data Source: Kansas Board of Pharmacy, Kansas Tracking and Reporting of Controlled Substance (2010-2012, 2015). Kansas population was based on the U.S. Census County Vintage 2015 post-censal estimate of the resident population of the United States by single year of age, bridge-race category and age-adjusted to the U.S. 2000 standard population. Credit: Images created by Iconarray.com. Risk Science Center and Center for Bioethics and Social Sciences in Medicine, University of Michigan. Accessed 2016-08-19. Comparison of indicators does not imply statistical significance. Each point estimate may include the same patients.
Concluding Thoughts

• Pain control is important and we must optimize patient function post operatively
• Opioids can be effective for acute pain but should be part of a multi-modal approach
• Prescribing guidelines can be beneficial but should consider patient factors
• Patient education is critical
• Questions?
References

References Continued