Non-Opioid Pain Management
Mechele Fillman MSN, NP
Robert Montgomery DNP, RN-BC, ACNS-BC

Objectives
• Name a neuraxial and regional technique to manage acute pain
• List two IV non-opioid medications that are useful for managing pain
• Describe two communication strategies for delivering the pain management plan

Why Non-opioid Pain Management
• Opioid Crisis—is it for real?
  • The Center for Disease Control and Prevention estimates $78.5 billion of economic burden/year in the US with regards to the cost of healthcare, loss of productivity, addiction treatment and criminal justice involvement.
  • 130+ people per day die from opioid related drug overdose
  • Roughly 21-29% of patients prescribed opioids for chronic pain misuse them
  • 8-12% develop an opioid use disorder
  • 80% of heroin users reported misusing prescription opioids prior to heroin
• Intolerance to opioid medications
• Previous problems with opioids, so now fears using opioids for pain management

Disclosure
• Mechele Fillman
  • No disclosures
  • I have only ever worked in the hospital setting
• Robert Montgomery
  • No disclosures

Non-opioid Pain Management
• How we manage pain in the hospital after a procedure or surgery can ultimately affect a patients trajectory with opioids
• Using a multimodal approach to pain management can reduce opioid utilization and provide improved pain management
• Multimodal regimen includes: neuraxial and regional techniques and a variety of non opioid analgesics that can have an additive, if not synergistic, effects.

Multimodal Pain Control
• Defined as the continuous use of more than one method for controlling acute pain
• Takes advantage of additive or synergistic effects through combining multiple agents
• Reduced side effects due to lower doses of drugs and differences in SE profiles
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Acute Pain May Rapidly Evolve into Chronic Pain

**Postsurgical Pain Syndromes**
- Amputation (30-50%)
- Breast (20-30%)
- Thoractomy (30-40%)
- Inguinal Hernia (10%)
- CAGB (30-50%)
- Caesarean (10%)
- Hysterectomy (5-32%)
- Knee Arthroscopy (30%)

**Risk Factors**
- Preceding pain
- Psychosocial factors (expectation, fear, memory, social environment, work)
- Older age and female gender

Multimodal Analgesic Techniques

- Opioids
- NSAIDs
- Acetaminophen
- Anticonvulsants (e.g., Gabapentin & Pregabalin)
- Neuraxial local anesthetic blocks: epidural, spinal
- Peripheral nerve blocks
- NMDA antagonists (Ketamine)
- Lidocaine Infusion
- Non-pharmacologic therapies

Case Study

- Pt A is a 44 yo, female
- s/p R tib/fib osteotomy with intramedullary nailing
  - PMH: Chronic low back pain, tibial deformity, spinal tap with subsequent blood patch
  - Home medications:
    - Methocarbamol 750mg TID, lidocaine patch, supplements (biotin, DHEA, niacin) and naproxen
  - Allergies: Alcohol (N/V); hydrocodone (SOB); all opioids cause either vomiting or SOB; Percocet (N/V); Gluten intolerance
- What kind of pain is she having?

Kinds of Pain

- Nociceptive: normal processing of stimuli
  - responds to opioids
- Somatic: arises from bone, joint, muscle, skin or connective tissue
  - aching, throbbing
  - localized
- Visceral: associated with internal organs
  - Deep
  - not well localized
- Neuropathic: abnormal processing of sensory input by peripheral or central nervous system (PNS or CNS)
  - less or not responsive to opioids

Kinds of Pain: Neuropathic

- Centrally generated
  - Deafferentation pain: injury to PNS or CNS (phantom limb pain, spinal cord injury)
- Peripherally generated
  - Polyneuropathies (diabetic neuropathy)
  - Mononeuropathies (nerve root compression)
- Not responsive to opioids
- Generally very hard to manage
## What Kind of Pain?

- **Nociceptive**—so normal processing of stimuli
  - Her surgery pain
- **Somatic**—pain arising from bone, joint, muscle, skin or connective tissue
  - Her surgery pain
- **Neuropathic**—abnormal processing of sensory input
  - Chronic back pain

## Case Study

- R sciatic nerve block with catheter infusing ropivacaine 0.2% at 6ml/hour
- R femoral nerve block with catheter infusing ropivacaine 0.2% at 6ml/hour
- Acetaminophen 1gm q 8h
- Celecoxib 100mg BID
- Gabapentin 600mg TID
- Lidocaine patch
- Tramadol 50mg q 6h prn

## What is Tramadol?

- A weak mu agonist + serotonin, norepi reuptake inhibitor
- As of August 2014, Tramadol was made schedule IV medication
  - It carries the same risks of opioids for respiratory depression and constipation
  - Can cause serotonin syndrome, use cautiously with pts who use SSNRI
  - Can cause a nasty withdrawal when stopped abruptly

## Regional Techniques

- Make it numb
- Less pain
- Opioid sparing effects
- Regional techniques prior to surgery
  - Maybe less intraoperative opioid
  - Maybe lower pain scores in the immediate post-operative period
    - by attenuating the process of nociception and sensitization

## Regional Techniques

- Generally classified as either neuraxial or peripheral
  - Neuraxial would include: epidurals and spinals
  - Peripheral would include: TAP (transversus abdominis plane) paravertebral, lumbar plexus, adductor canal, popliteal, sciatic catheters/single blocks (this is not an exhaustive list)
- Both neuraxial and peripheral techniques have the advantages of less pain and opioid sparing effect
- Neuraxial technique has been shown to facilitate earlier return to GI function, attenuates immunosuppression and reduced pulmonary/cardiac morbidity

## Regional Techniques

- Disadvantages of neuraxial technique include: technique failure, hypotension, backache, post dural puncture headache, N/V, pruritus, respiratory depression & urinary retention (with neuraxial opioid), infection, hematoma, motor weakness, sensory deficits
- Peripheral technique advantages previously stated, less pain, opioid sparing, less sedation, less N/V
  - Disadvantages: technique failure, sensory deficits, motor weakness
    - TAP: perforation of peritoneum, local anesthetic toxicity, does not cover visceral pain
    - Paravertebral: hypotension (though less than epidural), vascular/pleural puncture, pneumothorax.
Case Study

• Back to our patient who is s/p R tib/fib osteotomy with intramedullary nailing. Because of her extensive allergy list; she is forcing us to use non-opioid/opioid sparing techniques to manage her post-op.

• She had both sciatic and femoral catheters with ropivacaine 0.2% at 6ml/hour
  • Which provided good pain relief, however,
  • Pt did not like the sensory and motor deficit
  • Pt was having her usual chronic back pain for which she normally takes naproxen, now stopped because of her surgery, she reports this pain to be severe, like when she gets a flare at home. Pt contributes hospital bed and being less mobile than usual to her increased back pain
  • we reassured her that the deficits would resolve when the infusions where turned off. She agreed to keep the catheters and infusions for another day

• But what to do about her severe chronic back pain?

Sciatic Nerve Block coverage

• Back of the thigh and knee

Femoral Nerve Block Coverage

• Front of thigh and knee

Multimodal Adjuvant - Lidocaine

• We transitioned her femoral and sciatic catheters to lidocaine 0.1% 6ml/hour in each catheter

• Because there is systemic uptake of the lidocaine, we ordered every 8 hour lidocaine blood level checks

• Because there is systemic uptake of the lidocaine, we anticipate pain relief of her chronic neuropathic pain as well as her surgical pain

• If she did not have catheters or her catheters failed and she did not want them replaced, IV lidocaine would have made a good option for her.

• If available: Lidocaine 1mg/kg/hour with every 8 hour lidocaine blood level checks. Drawing from the line or above the line can/does result in falsely high blood levels.

• How does lidocaine help with pain?
  • by suppressing ectopic discharges after peripheral nerve injury
  • blocks Na+ channels
  • Suppression of neural activity

Lidocaine

• Who should get IV lidocaine?
  • Post surgical patients for which a regional technique was not possible
  • Post surgical patients with opioid tolerance and chronic pain
  • Chronic pain patients with an acute flare

• Who should not get IV lidocaine?
  • Liver dysfunction
  • Previous intolerance
  • Allergy

• Advantages:
  • Reduces post-operative pain, opioid sparing
  • Reduce time to first flatus and bowel movement
  • Reduce length of stay without significant systemic anesthetic toxicity

• Disadvantages:
  • Every 8 hour lab draws (if available)
    • this lab value is about toxicity not therapeutic range
  • Somnolence, light headedness, agitation
Lidocaine

- Signs and symptoms of toxicity:
  - Tinnitus
  - Personal numbness
  - Metallic taste in mouth
    - The above 3 are the first signs of toxicity; responds to stopping infusion
  - Seizure—stop infusion, support
  - Cardiac collapse—stop infusion, intralipids, support
  - Active metabolite MEGX
    - may contribute to clinical lidocaine analgesia and toxicity just after a couple of days
  - Caution with hepatic, cardiac or renal insufficiency
  - With that said, Lidocaine IV is very safe

Lidocaine

- Transdermal lidocaine
  - Can be very useful
  - Can use up to 3 patches/day
  - Can change every 24 hours
    - watch for skin irritation, if it occurs switch back to on 12 hours then off 12 hours
  - Can be used in conjunction with lidocaine IV infusion
- Disadvantages:
  - expensive and not covered by insurance
  - they don’t stay in place (wrinkle up, get stuck to clothes or bed sheets)
  - Lidocaine cream or ointment
    - Can also be very useful
    - Stays where it is applied
    - Inexpensive

Multimodal Adjuvant - Ketamine

- Despite peripheral nerve catheters and adjuvants, our pt was still in severe pain, unable to work with PT or meet post op functional goals.
- IV Ketamine started
- What is Ketamine?
  - Phenylpiperidine derivative
    - structurally r/t phencyclidine (PCP or angel dust)
    - N-methyl-D-aspartate (NMDA) antagonist
  - Blocks transmission of painful stimuli: Analgesic in low doses
  - Interacts with opioids additively or synergistically
  - Can be very effective in crisis situation: tolerant patient with severe pain, unresponsive to high dose opioids
  - Metabolized in the liver

Ketamine

- Advantages
  - Non-opioid
  - Will NOT cause respiratory depression
  - Will not cause hypotension, can actually increase blood pressure
  - Can be used in addition to opioids and IV lidocaine

Ketamine

- Disadvantages/Side Effects
  - Tachycardia
  - is dissociative—out of body
  - Hallucinations
  - Memory deficits
  - Anxiety, agitation, panic attacks
  - Usually transient and disappear within 60 minutes of discontinuation
- Indications
  - Acute post surgical pain
  - High opioid tolerance

Ketamine

- Contraindications:
  - PTSD, nightmares,
  - Head injury—increases intracranial pressure
  - Cardiac disease
    - at low doses—>tachycardia, systemic and pulmonary hypertension
      - increases cardiac output
      - myocardial oxygen consumption
    - at high doses—>myocardial depression is observed
### Multimodal Adjuvants - Acetaminophen
- Acetaminophen
  - Opioid sparing
  - Pain relieving
  - Additive/synergistic analgesic effect
- 650 q 6 h scheduled
  - contraindicated/use cautiously in liver dysfunction
  - limit 4gm/day
  - Recommended as 3 gm/day by the manufacturer

### Multimodal Adjuvants - Gabapentinoids
- Gabapentin (Neurontin)
  - 1993 FDA approved as adjunct therapy for partial seizures in patients > 12 years of age
  - 2000 approved for children 3 to 12 years of age for the same indication
  - 2004 approved for treatment of post-herpetic neuralgia in adults
  - There is widespread off label use for bipolar disorder, attention deficit/hyperactivity disorder, restless leg syndrome, drug and alcohol withdrawal seizures and sleep disorders, neuropathic pain

### Gabapentinoids
- Disadvantages/Side effects
  - Sleepiness
  - Mental cloudiness
  - weight gain
  - peripheral edema
  - Pregabalin (Lyrica)
    - FDA approved for epilepsy, diabetic neuropathic pain, post herpetic neuralgia and fibromyalgia
    - Pregabalin may have an additional system of absorption or it may be better transported than gabapentin as it is almost completely absorbed.
    - Both pregabalin and gabapentin are cleared renally
      - Use lower dosing in renal impairment
      - Reduce dose or discontinue if over sedation occurs

### NSAIDs and Surgery
NSAIDs should be utilized in the multimodal management of acute pain unless otherwise contraindicated

**AHCPRAcute Pain Guidelines 1992**
**APS Acute Pain Guidelines 2008**
**ASA Task Force on Acute Pain 2012**
**ASA, APS, DOD Postop Pain Guidelines 2016**

### Multimodal Adjuvant - NSAIDS
- Non-steroidal anti-inflammatory drugs (NSAIDs) are a common over-the-counter pain reliever
- Also an important arm of a multimodal pain management regimen
- How it works: inhibits cyclooxygenase (COX) which is an enzyme in prostaglandin synthesis. Exists in two forms.
  - COX1 which is responsible for cell functions (platelet aggregations, gastric protection, kidney function)
  - COX2 which is inducible during states of inflammation
- The extent of enzyme inhibition is different among NSAIDs
- There is also patient variability in response to different NSAIDs
- This suggests that transitioning from one NSAID to another in a different class could improve pain relief
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What regimen should we send our patient home on?

• In this case the patient requested the regional catheters be removed and just wanted to acetaminophen and gabapentin for discharge
• If she would have wanted the regional catheters at time of discharge, the catheters would be transitioned to a disposable device suitable for home and verbal and written instructions given on care and removal

Case Study

Pt S. is a 56 year old woman admitted for fever, chills, malaise was found to have UTI. Pt reporting increased pain and demands IV hydromorphone. Primary team started 1.5mg IV hydromorphone q 4 h pm. Primary team also restarted her home medications. They offered acetaminophen, gabapentin, pregabalin and NSAIDs. The pt. either reported allergies or ineffectiveness to all adjuvants. She is ready to go home but the Primary team cannot wean/stop her IVP hydromorphone, so they place a pain consult
• This is what I call a hostage situation
• PMN: chronic high dose opioid use PTA
  • Oxycodone SR 80mg TID
  • Oxycodone 30mg q 4 prn uses 6-8 doses a day
  • Failed back syndrome: multiple back surgeries
  • Reports all adjuvants are ineffective and only IVP hydromorphone is works

Mojo

• Before you start the conversation:
  • Know the plan—discharge? More studies? Invasive procedures?
  • POMP report—know who writes what for the patient
    • this keeps you from potentially having to write discharge opioids
    • also keeps from inadvertently giving the patient multiple different opioids
  • Also a call to the writing provider can help with a discharge plan
    • an appointment the day of discharge or soon after
    • report any concerns you have or found during this admission
    • i.e. pt admitted they misuse their opioids, multiple providers

• Start the conversation:
  • How are you doing?
  • Empathize: Assure patient that you want to listen and understand the impact of pain on their life and that their pain is real

NSAIDS

• Now the big question—Do NSAIDs inhibit bone healing?
  • Turns out we are not really sure
  • There are many studies with so many different variables, for example
    • One study used 10 times the dose that is indicated for humans
    • Animal models differed
    • Fractures differed
    • Some found bone healing interference
    • Some proved NSAIDs did not interfere
    • Also length of therapy varied
  • There is no evidence to prove that NSAIDs must not be used
  • But also there is no evidence to support that NSAIDs do not cause harm
• Take Home
  • NSAIDs are OK for short term in hospital use, in the low/normal risk patient
  • Avoid in high risk patients: Previously non-union, smoker, obesity, osteoporosis, chronic steroid use, malnutrition and chronic illnesses

Mojo

• Encourage an active patient role in developing treatment goals
• Focus on function rather than pain scores
  • This is difficult in the in-patient setting as the nurses have protocols that ask for pain scores
  • If it is truly problematic, you can write an order that give the nurses permission to NOT ask the pain scores
• Use neutral terms when describing the plan
  • For example: don’t say we are stopping, taking away, decreasing, weaning
  • Instead try saying we are making adjustments to make you more comfortable
  • However if it is reasonable to increase medications, words like increasing or doubling the dose can be useful
• Focus on how well the patient is progressing

Case Study

• Pt is taking good PO
• Her acute reason for being admitted is resolved.
• She is on her home regimen
• A discussion was held explaining to the patient that the IV hydromorphone would be adjusted to every 6 hours today than every 8 hours than stopped.
• Pt is worried about withdrawal—pt has plenty of prn oxycodone, so withdrawal is not an issue
• At this point, Primary team, Pain team and nursing all need to agree that reports of increased pain will not be treated with IVP hydromorphone.
• It imperative that the night teams know the plan as well.
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Mojo
- Focus on function rather than a pain score
- Provide positive encouragement for the smallest task forward
- Reassure everything is being done
- For surgical patients: reassure that surgical pain gets better every day
- Set expectations
  - IV medications are not sustainable
  - IV medications are not medically indicated if the patient is taking PO
  - Redirect patient back to the provider who is writing

Mojo
- Reassure pt that finding an oral regimen that manages their pain before leaving the hospital is the goal (not stopping IV the day they go home)
- 4 A’s of opioid use:
  - Is it providing Analgesia?
  - Is it providing improved Activity?
  - Are there Adverse reactions/side effects/behaviors?
  - Are there Aberrant behaviors? (opioid misuse, increased ED visits)

Mojo
- Staff splitting
  - Have teams go in together, primary team, pain team, nursing, psychiatry, etc.
  - Decide on the message
  - Pick a messenger
    - multi-disciplinary team backs up the messenger
  - Firm, consistent limit setting among the teams
    - For example, pt’s mom sniffing nurses and insisting that they go shower before they could care for her daughter
    - Also insisting everyone wear gowns
  - Nurse manager stepped in with the support of the Allergist and Infectious disease to say there was no indication for such precautions

Pulling it All Together
- Multimodal
  - Make it numb with regional techniques if possible
  - Adjuvants
    - Acetaminophen
    - Gabapentinoids
    - NSAID
    - Lidocaine
    - Ketamine
- Good communication from the start - accurate perceptions and firm limit setting

Opioid Prescribing Guidelines for Common Surgical Procedures: An Expert Panel Consensus
March 8, 2017

[Table and chart with guidelines for opioid prescribing]
Prescribing Recommendations

**Updated 2019**

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</tr>
<tr>
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**Counseling Patients**

**Mojo**

- Start the conversation early
- Preop visit
- Day before discharge
- Day of discharge

**Washington State Opioid Guideline**

**Postop Opioids at Discharge**

- Opioid tolerant patient, do not add or increase long-acting opioids for the immediate postop period
- Avoid continuing or adding NEW benzodiazepine, sedative-hypnotics, anxiolytics, CNS depressants
- Limit supply to 2 weeks or less; minor surgeries may need only acetaminophen or NSAID only or with a 2-3 day supply of opioid
- Taper off as healing occurs and pain resolves during the first few weeks; goal of stopping by 6 weeks if clinically meaningful improvement in function and pain is not occurring

**Washington State Opioid Guideline**

Clinically Meaningful Improvement

- Clinically meaningful improvement is defined as an improvement in pain AND function of at least 30% as compared to the start of treatment or in response to a dose change
- A decrease in pain intensity in the absence of improved function is not considered meaningful improvement except in very limited circumstances such as catastrophic injuries (e.g. multiple trauma, spinal cord injury, etc.)
Non-Opioid Pain Management
Mechele Fillman MSN, NP
Robert Montgomery DNP, RN-BC, ACNS-BC

Washington State Opioid Guideline
Clinically Meaningful Improvement
• Assess and document function and pain using validated tools at each visit where opioids are prescribed.

PEG: 3-item tool to assess pain intensity, interference with Enjoyment of life, and interference with General activity

Table 1. Evidence-based duration of Opioid prescriptions on discharge following surgery
Based on data showed that these opioid prescription durations are associated with trial postoperative pain in >50% of patients without refills.

<table>
<thead>
<tr>
<th>Type III – Expected medium term recovery</th>
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<td>Procedure: such as lumbar fusion, knee replacement, hip replacement, esophagectomy, radical prostatectomy, thoracic surgery, or hip/knee replacement</td>
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<td>Prescribe non-opioid analgesics (e.g., NSAIDs and/or acetaminophen) and non-pharmacologic therapies as first-line therapy.</td>
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<td>Prescribe short-acting opioids for severe pain.</td>
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<td>Prescribe the lowest effective dose strength.</td>
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<td>Prescribe 7-10 days (e.g., up to 42 pills) of short-acting opioids for severe pain.</td>
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<td>For those exceptional cases that warrant more than 7 days of opioid treatment, medications such as formalin enteric-coated, naltrexone and taper off opioids within 1-2 weeks after surgery.</td>
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Patient’s Chronic Opioid Analgesic Therapy
Elective surgery in patients on chronic opioid therapy
• Prescribe non-opioid analgesics (e.g., NSAIDs and/or acetaminophen) and non-pharmacologic therapies as first-line therapy.
• Reassess chronic opioid regimen if patients are expected to continue postoperatively.
• Follow the recommendation above for prescribing the duration of short acting opioids following a particular surgery (e.g., 5, 7, or 14 days). The patient may be asked to take the opioid at home to ensure compliance. The dose may be reduced to a half or a quarter of the total daily dose if a skilled tapering period is provided. The patient’s postoperatively. Prescribe the lowest effective dose strength.
• For those exceptional cases that warrant more than 14 days of opioid treatment, the surgeon should evaluate the patient before initiating doses and taper off opioids within 1-2 weeks after surgery to no higher total daily dose than was prescribed pre-operatively.
Non-Opioid Pain Management
Mechele Fillman MSN, NP
Robert Montgomery DNP, RN-BC, ACNS-BC

**CDC Guideline: Opioids for Chronic Pain**

- Recommendations
  - Prescribe opioids only after other therapies have failed
  - Establish treatment goals before prescribing
  - Continue only if there is clinically meaningful improvement in pain and function
  - Start with immediate release instead of extended release opioids
  - Prescribe lowest effective dosage

- Patients who used opioids for at least 90 days were 60% more likely to still be on chronic opioids in 5 years

**Colorado Medicaid**

- Limitations in supply of opioids to opioid naïve patients
  - Naïve = no prescriptions for opioids in past 12 months
  - Initial supply limited to 7 days with potential for two more 7 day supplies
  - Fourth prescription will require prior authorization/consultation with Medicaid’s Drug Utilization Review Board
  - Before policy update, members were allowed up to a 30 day initial supply

- Other Limitations (opioid naïve)
  - Maximum of 8 dosage forms per day (up to 56 tablets for a 7 day supply)
  - Long acting opioids (Oxycontin, MS Contin) will require prior authorization for opioid naïve patients
  - Opioid prescriptions for > 4 tablets/day require the pharmacy to process an acute pain override (ICD-10 code G89.1) when appropriate, or obtain prior authorization.
  - Quantity limits of 120 tabs/30 days still apply
Non-Opioid Pain Management
Mechelle Fillman MSN, NP
Robert Montgomery DNP, RN-BC, ACNS-BC

Colorado Medicaid

- Phase 2 of Medicaid policy update
- Total daily limit of morphine milligram equivalents (MME) will be reduced from 300 to 250
- Prescriptions for >250 MME daily will require prior authorization or consultation with Medicaid pain management physician
- 250 MME limit will not apply to members in hospice/palliative care, or being treated for cancer
- Prior authorizations may be granted for patients tapering down from higher opioid doses

Opioid Prescribing Guidelines

Different agencies are advocating different thresholds for caution with opioid prescriptions
- CDC guidelines advocate 90 MME as an upper limit and advise caution at higher doses, citing evidence that doses exceeding 90 MME increase overdose risk
- Colorado Medical Regulatory Boards cite 120 MME as a threshold above which additional safeguards should be in place

References


Reference List