Clinical Pearls in Multimodal Pain Management

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Pharmacist Objectives

- Define “pain” and name the different types of pain
- Interpret clinical measurements of pain based on pain scales
- Describe “multimodal” pain management and how it improves pain outcomes
- Evaluate new medications involved in pain management
Pharmacy Technician Objectives

- Define “pain” and name the different types of pain
- Define “pain scales” and how they are used to determine pain scores
- Define the term “multimodal” pain management
- List new medications involved in pain management
Pain is defined as...

An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in such terms as damage.

- International Association of the Study of Pain (IASP 2010)
Types of Pain

- Acute
- Chronic
- Neuropathic
Acute Pain

- Sudden onset caused by tissue damage
- Lasting < 6 months
- Somatic

Description:
- Sharp
- Stabbing
- Throbbing
- Intermittant
Chronic Pain

- Lasting > 6 months
- Hard to pinpoint exact location
- Visceral

Description:
- Dull
- Achy
- Constant
Neuropathic Pain

- Usually categorized as chronic pain
- Involves damage to nervous system
- Description:
  - Shooting
  - Prickling
  - Pins and needles
  - Burning
Pain Scales

- Used to measure pain intensity
- Self reported
- Observational (behavioral)
- Physiological
Wong-Baker FACES Pain Rating Scale

Simple Descriptive Pain Intensity Scale

No pain  Mild pain  Moderate pain  Severe pain  Very severe pain  Worst possible pain

0–10 Numeric Pain Intensity Scale

No pain  1  2  3  4  5  6  7  8  9  10  Worst possible pain

Visual Analog Scale (VAS)

No pain  Pain as bad as it could possibly be

If used as a graphic rating scale, a 10 cm baseline is recommended.

A 10-cm baseline is recommended for VAS scales.
Why all the Fuss?

- Pain is a miserable experience
- Pain limits mobility
  - Increases risk of DVT/PE
  - Increase risk of pneumonia, atelectasis secondary to splinting.
- Pain increases sympathetic output
  - Increases myocardial oxygen demand
  - Increases BP, HR
Assessment of Pain

- Intensity
- Location
- Onset
- Duration
- Radiation
- Exacerbation
- Alleviation
How do we do manage it?

- **Multimodal analgesia**: several analgesics with different mechanisms of action, each working at different sites in the nervous system

- Local anesthetics - Peripheral nerve blocks/ Epidurals
- Non-steroidal anti-inflammatory drugs (NSAIDS)
- Opioids
- Anticonvulsants
- Muscle Relaxants
- Antidepressants
- NMDA Antagonists
- Non-pharmacologic methods
Pain Medications

- Efficacy is limited by side effects
  - The higher we escalate dosage with single mode analgesia, the greater the degree of side effects
Benefits of Multimodal Analgesia

- Lower doses of each drug can be used therefore minimizing SE
- May include more than one route of administration
- Synergistic effects between different drug classes can enhance the effects of each drug
- Especially effective in patients who are at risk for the SE of large doses of opioids
  - Frail/elderly
  - Obstructive sleep apnea
  - Chronic pain patients
Peripheral Nerve Blocks

- Provides postoperative analgesia after painful orthopedic procedures
- Can reduce the amount of pain after surgery roughly by 50%
- Reduces the amount of pain medications needed after surgery
- May decrease the length of stay in the hospital
Systemic Analgesia

- Acetaminophen
- NSAIDs
- Opioids
- Anticonvulsants
- Antidepressants
- Muscle relaxants
- Adjuvants
Acetaminophen

- PO/IV/PR
- 325-1000mg po q4-6 hours (Max of 4gm in 24hr)
- Onset: 30-60 minutes
- Side effects: rare (severe = hepatotoxicity)
- Treats mild to moderate pain (acute or chronic)
  - Arthritis, Headache, post surgical, throat pain, muscle aches
NSAIDs

- PO/ IV/IM/Topical
- Dose & Onset: medication specific (see next slide)
- Side effects: GI intolerances, Nephrotoxicity
- Treats mild to moderate pain (acute or chronic)
  - Headache
  - Inflammation (Arthritis)
  - Post-surgical pain
  - Boney pain
NSAID Dosing

- **Aspirin**
  - 325-650mg PO/PR q 4-6hr

- **Ibuprofen**
  - 200-800mg PO q 4-6hr (max 3.2gm/d)

- **Ketorolac**
  - 10mg PO TID
  - 15-30mg IV/IM q 4-6hr

- **Naproxen**
  - 220-500mg PO BID-TID

- **Celecoxib**
  - 100-200mg PO BID

- **Nabumetone**
  - 500-750mg PO BID-TID

- **Meloxicam**
  - 7.5-15mg PO daily

- **Indomethacin**
  - 25-50mg PO BID-TID
Opioids

- PO/IV/IM/PR/SQ/Inhalation/Topical
- Dose & Onset: specific to each opioid
- Side Effects: respiratory depression, sedation, constipation, urinary retention, rash, bradycardia, hypotension
- Treats mild to moderate to severe pain (acute or chronic)
Chronic Opioid Dosing

- **Morphine CR**
  - 15-60mg PO q12hr

- **Oxycodone CR**
  - 10-80mg PO q12hr

- **Fentanyl**
  - 12-100 mcg/hr transdermal q72hr

- **Buprenorphine**
  - 5-20 mcg/hr transdermal q7days
Neuropathic Agents for Pain

- PO only
- Adjuvant medication used for chronic pain
- Can be used for visceral type pain
- Dose & Onset: specific to each medication
- Side effects: dizziness, somnolence, ataxia
- Treats neuropathic type pain such as
  - Trigeminal Neuralgia, Peripheral Neuropathy, and Fibromyalgia
Neuropathic Agents for Pain

- Gabapentin (Neurontin)
- Pregablin (Lyrica)
- Carbamazepine (Tegretol)
- Zonisamide (Zonegran)
- Oxcarbazepine (Tripleptal)
Antidepressants for Pain

- Adjuvant medication
- Used to treat chronic pain
- Exact mechanism not understood
- Treats neuropathic disorders

Side effects:
- Hypotension
- Tachycardia
- Fatigue
- Seizures
Antidepressants for Pain

- Tricyclic Antidepressants
  - Amitriptyline
  - Nortriptyline

- SSRIs
  - Fluoxetine (Prozac)
  - Paroxetine (Paxil)

- SNRIs
  - Duloxetine (Cymbalta)
  - Venlafaxine (Effexor)
Other Adjuvant Medications for Pain Management

- Muscle Relaxants
- Benzodiazepines
- Topical Analgesics
Muscle Relaxants

- PO/IV/IM
- Adjuvant medication to help with spasms of muscles that can contribute to pain
- Mechanism of action slightly different for each agent
- Side effects:
  - Dizziness/drowsiness
  - Fatigue
  - Headache
  - Weakness
Benzodiazepines

- PO/IV/IM
- Adjuvant medication used for anxiety and/or muscle spasms
- Dose & Onset: specific to each medication
- Side effects:
  - Hypotension
  - Constipation
  - Dry mouth
  - Dizziness/drowsiness
Benzodiazepine Dosing

- **Diazepam (Valium)**
  - 2.5-10mg PO/IV/IM q4hr

- **Lorazepam (Ativan)**
  - 0.25-2mg PO/IV/IM q4hr

- **Alprazolam (Xanax)**
  - 0.25-0.5mg PO q4hr

- **Clonazepam (Klonopin)**
  - 0.25-0.5mg PO TID
Topical Analgesics

- Used for mild to moderate pain
- Delivers relief directly to the point of pain without systemic side effects
- Side effects:
  - Burning/irritation at site of application
**Topical Analgesic Dosing**

- **Lidocaine (Lidoderm)**
  - 5% apply 1-3 patches to AA for 12hr (off for 12hr)

- **Capsaicin**
  - 0.025%-0.075% 3-4 times/day

- **Diclofenac (Flector)**
  - 1.3% apply 1 patch for affected area q12hr

- **Menthol/Salicylate (Biofreeze)**
  - apply topically to affected area TID

- **Special compounded combinations**
Other Adjuvant medications for chronic pain patients

- **Dextromethorphan**
  - NMDA receptor antagonist
  - Dose= 600mg PO TID scheduled
  - Used in chronic pain patients on high doses of opioids or for diabetic neuropathy

- **Ketamine**
  - NMDA receptor antagonist
  - Beneficial for treatment of pain associated with burns, neuralgias, cancer, and pain refractory to opioid therapy
  - Restricted at this time to ED and ICU only at Avera McKennan

- **Clonidine**
  - Increase in GABAa activity
  - Beneficial for the treatment of pain in Diabetic neuropathy, postherpetic neuralgia, and aquadynia
Multimodal example

- Preoperatively
  - Oxy Cr 20mg po x 1
  - Acetaminophen 1000mg po x 1
  - Celebrex 400mg po x 1 (if not given, anesthesia may give ketorolac 15mg IV intraoperatively)
Multimodal example cont.

- Post – operatively
  - Acetaminophen 500mg po 4xd while awake
  - Ketorolac 15 mg IVP q6h x 4 doses (for patients ≥ 65 y/o or ≤ 50 kg)
  - Ketorolac 30 mg IVP q6h x 4 doses (for patients ≤ 65 y/o or ≤ 50 kg)
  - No Ketorolac if SCr ≥ 1.5 or CrCl ≤ 30 ml/min
  - Oxycodone CR 10 mg po BID x 4 doses post-op (for patients ≥ 65 y/o or ≤ 75 kg)
  - Oxycodone CR 20 mg po BID x 4 doses post-op (for patients ≤ 65 y/o or ≥75 kg)
  - Mobic 15mg po daily after toradol completed (for SCr ≤ 1.2) x 4 doses
Multimodal example cont.

- **Mild Breakthrough Pain**
  - Tramadol 50-100 mg po q 6h PRN (max of 400 mg in 24 hr)

- **Moderate Breakthrough Pain**
  - OxyIR 5-10 mg po q3h PRN
  - Hydrocodone/APAP 5/325 1-2 tabs po q4h PRN (max of 3250 mg of APAP in 24 hr)
  - Nucynta 50-100 mg po q4h PRN (for patients with adverse reactions to codeine-related products) (max of 500 mg in 24 hr)

- **Severe Breakthrough Pain**
  - Morphine 2-6 mg IV q2h PRN
  - Hydromorphone 0.5-1 mg IV q2h PRN
  - Fentanyl 25-50 mcg IV q2hr PRN
New Treatment Options for Pain Management

- Tapentadol (Nucynta)
- Naloxone (Evzio)
- Oxycodone/Naloxone (Targiniq)
- Buprenorphine (Butrans)
- Hydrocodone (Zohydro)
Tapentadol (Nucynta)

- Weak opioid agonist
- Serotonin and Norepinephrine reuptake inhibitor
- CII
- Marketed for patients with GI effects from other opioids
- Approved for the treatment of diabetic peripheral neuropathy
Naloxone (Evzio)

- Opioid antagonist
- Single use 0.4mg auto injector
- Rescue med for opioid induced respiratory depression from overdose
- Patient, family members, care givers
- Approx $345
- Approved April 2014
Oxycodone/Naloxone (Targiniq)

- Opioid agonist/opioid antagonist
- 10/5, 20/10, 40/20
- Extended release, abuse deterrent
- Indicated for the treatment of severe pain, requiring around-the-clock, long term opioid use
- Approved July 2014

<table>
<thead>
<tr>
<th>EQUIVALENT DAILY ORAL MORPHINE DOSE</th>
<th>RECOMMENDED TARGINIQ ER STARTING DOSE</th>
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<tbody>
<tr>
<td>20 to &lt; 70 mg</td>
<td>10 mg/5 mg every 12 hours</td>
</tr>
<tr>
<td>70 to &lt; 110 mg</td>
<td>20 mg/10 mg every 12 hours</td>
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<tr>
<td>110 to &lt; 150 mg</td>
<td>30 mg/15 mg every 12 hours</td>
</tr>
<tr>
<td>150 to 160 mg</td>
<td>40 mg/20 mg every 12 hours</td>
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Buprenorphine (Butrans)

- Partial Agonist
- 7 day transdermal patch
- C-III
- Approved July 2010
- Cost $195-$515 (per 4 patches)
Hydrocodone ER (Zohydro)

- Opioid agonist
- Approved for severe pain requiring around the clock, long term, opioid use
- No abuse deterrent properties
- CII
- Approved April 2014
Questions
References


References


Pharmacist Questions

- T/F – Pain scales are the only determining factor for a patient’s current pain level?

- T/F – Somatic pain is defined as acute musculoskeletal pain that is identified and easier to treat?

- Which medications would be considered part of a multimodal pain regimen?
  a) Celecoxib
  b) Oxycodone/APAP
  c) Paroxetine
  d) All of the above

Answers: F, T, d)
Technician Questions

- T/F – Multiple different pain scales exist to help determine a patient’s pain level?
- Name the 3 main types of pain.
- Multimodal pain is defined as
  a) A single pain medication used to treat one type of pain
  b) No use of pain medications
  c) Multiple pain medications with different mechanisms of action used together to help limit pain
  d) None of the above

Answers: T, Acute/Chronic/Neuropathic, c)