OSHP 2019 Spring Meeting

Pain Management

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Disclosures

• Under guidelines established by the Accreditation Council for Pharmacy Education, disclosure must be made regarding financial relationships with commercial interests with the last 12 months.

• I have no relevant financial relationships or affiliations with commercial interests to disclose.
Objectives

At the completion of this activity, participants will be able to:
• Distinguish between the definitions of acute and chronic pain.
• Describe three barriers to effective pain control.
• Compare and contrast commonly used opioids.
• Outline a treatment plan for a patient with moderate to severe pain as well as unique pain syndromes (e.g., neuropathic pain)**

**Pharmacists only

Overview

• Important Definitions
• Barriers to effective pain control
• General approach and guidelines for adult pain management
• Review of pharmacologic options
• Supportive care
Patient Case #1

• MK is a 31-year old female who has just delivered her second child via uncomplicated cesarean section. The physician is preparing prescriptions to give MK for pain control once she is discharged.
  • NKDA
  • No clinically significant co-morbid conditions
• What is an appropriate prescription for outpatient pain management for MK?

Classification of Pain: Acute vs. Chronic

<table>
<thead>
<tr>
<th>Type of Pain</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute</strong></td>
<td>The physiologic response to and experience of noxious stimuli that can become pathologic, is normally sudden in onset, time limited, and motivates behaviors to avoid potential or actual tissue injury.</td>
</tr>
<tr>
<td><strong>Chronic</strong></td>
<td>Pain that persists beyond normal tissue healing time, which is assumed to be three months.</td>
</tr>
</tbody>
</table>

Pain Medicine 2017;18:947-958
Classification of Pain: Acute vs. Chronic

<table>
<thead>
<tr>
<th></th>
<th>Acute Pain</th>
<th>Chronic Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temporal</strong></td>
<td>Recent onset, lasting days to weeks</td>
<td>Lacks well defined onset, lasting &gt; 3 months</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>Surgery, acute illness, trauma</td>
<td>Complex regional pain syndrome, osteoarthritis, fibromyalgia, cancer pain</td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td>Sharp, dull, shock—like, tingling, shooting, radiating, fluctuating in intensity, and varying in location</td>
<td>Same as acute but occurs without a timely relationship with an obvious noxious stimuli and over time pain stimulus can cause symptoms to completely change (sharp to dull, obvious to vague)</td>
</tr>
<tr>
<td><strong>Signs</strong></td>
<td>Hypertension, tachycardia, diaphoresis, mydriasis, pallor, grimacing</td>
<td>In most cases NO obvious signs</td>
</tr>
</tbody>
</table>

Pain Categories

- **Somatic**
  - Well localized
  - Source often identifiable
  - Aching, gnawing, throbbing, cramping

- **Visceral**
  - Poorly localized, constant
  - Caused by discrete nociceptors in cardiovascular, respiratory, GI, GU systems
  - Deep, squeezing, tender

- **Neuropathic**
  - Injury to peripheral receptor, afferent fiber, or CNS
  - Burning, stabbing, shooting

Holland-Frei Cancer Medicine. 6th ed. 2003
Barriers to Pain Management

1. Inadequate knowledge of healthcare professionals
   • Reluctance to prescribe opioids
   • Lack of knowledge of equianalgesic dosing
   • Poor pain assessment
   • “Ceiling effect”

2. Cultural and social barriers
   • Patient and doctors
   • Social stigmatization

3. Government regulations

4. Insurance policies
   • Prior authorization
   • Preferred agents

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tr>
<td>Abuse</td>
<td>Maladaptive pattern of prescription opioid use leading to clinically significant impairment and/or distress</td>
</tr>
<tr>
<td>Addiction</td>
<td>Aberrant use of a substance characterized by: loss of control, craving, compulsive use, continued use despite harm</td>
</tr>
<tr>
<td>Chemical coping</td>
<td>Misuse of medication in in a non-prescribed way to cope with various stressful events associated with diagnosis and management of cancer</td>
</tr>
<tr>
<td>Diversion</td>
<td>Transfer of a prescribed medication from the person for whom it was prescribed to another person</td>
</tr>
<tr>
<td>Misuse</td>
<td>Inappropriate use of a prescription drug, whether intentional or unintentional, and regardless of motivation</td>
</tr>
<tr>
<td>Physical dependence</td>
<td>Pharmacologic property of some drugs, defined solely by the occurrence of an abstinence syndrome after dose reduction, discontinuation of dosing, or administration of an antagonistic drug</td>
</tr>
<tr>
<td>Pseudoaddiction</td>
<td>Distress and perceived drug-seeking behaviors that occur in the context of unrelieved pain. Behaviors subside when analgesia is achieved.</td>
</tr>
<tr>
<td>Tolerance</td>
<td>Diminution of one or more drug effects (either favorable or adverse effects) caused by exposure to the drug</td>
</tr>
</tbody>
</table>
Oklahoma SB1446 – effective Nov 1, 2018

• **Acute** pain syndrome
  • Initial prescription may not exceed 7 day supply
  • Immediate-release opioid only
  • Lowest effective dose
  • A second 7-day supply may be issued

• **Chronic** pain prescriptions
  • Review plan every 3 months

• Morphine milligram equivalent
  • 100MME is the safe patient threshold. Document rationale thoroughly if prescribed above this threshold

[www.okmedicalboard.org](http://www.okmedicalboard.org)  
[www.ok.gov](http://www.ok.gov)

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CDC Dosing Recommendations

• MME = morphine milligram equivalents
• Use extra precautions when prescribing doses > 50 MME/day
  • Monitor and assess pain and function more frequently
  • Discuss dose reduction and tapering
  • Consider offering naloxone
• Avoid or carefully justify increasing dosage to > 90 MME/day
Sample conversion to MME

- HN takes oxycodone IR 5mg tablets for an acute pain syndrome. He reports taking 2 tablets every 6 hours around the clock for the last three days. What is the MME of his current dosage?

2 x 5mg tablets = 10mg per dose
Q6 hours around the clock = 4 doses per day
10 mg x 4 doses = 40mg oxycodone PO daily

40mg oxycodone x 1.5 (conversion factor from table) ➔ 60mg MME per day
Patient Case #1

Back to MK and her outpatient prescriptions for pain after childbirth. Pain management for MK falls into which category:

A. Acute
B. Chronic

Patient Case #1

The physician prescribes the following:

- Oxycodone/APAP 5/325mg
- Qty: 60 tablets
- 1 PO Q6H PRN pain

Is this prescription in compliance with the recently passed opiate Oklahoma prescribing law SB 1446?

No. This prescription is a 15-day supply, and exceeds the 7-day maximum for an initial supply for acute pain.
Approach to Pain Management

Management Overview

Assess ➔ Treat ➔ Reassess
General Principles

- Consider pain diagnosis, comorbid conditions, and potential drug interactions
- Anticipate and treat analgesic adverse effects
- Provide psychosocial support (complex pain syndromes)
- Provide patient and family/caregiver education

WHO Analgesic Ladder

Adapted from the World Health Organization
Mild Pain


Non-Opioid Agents

1. Acetaminophen (Tylenol)

2. NSAIDs
   - Aspirin
   - Nonspecific NSAIDs
   - COX-2 Inhibitors
Non-Opioid General Principles

- Agents should be dosed around the clock
- Use the maximum doses of each agent
- Switch to an agent in a different class
- All agents have a “ceiling effect”
- Dependence absent

Acetaminophen

- **Mechanism:**
  - Acts within the CNS by reducing synthesis of prostaglandins
    - Blocks the action of central cyclooxygenase
  - Antipyretic: acts on hypothalamus resulting in peripheral vasodilation
    - No anti-inflammatory action

- **Adverse Effects:**
  - Hepatotoxicity
    - Use cautiously in liver disease or alcoholics
  - Rash
Acetaminophen Dosing

• 325 to 650 mg every 4 to 6 hours
• IV formulation now available:
  • Ofirmev \( ^\circledR \) 1000 mg vials

  • \textbf{Max dose 4 g daily}
  • \textbf{OTC max dose 3 g daily}

• Liver disease or alcoholic
  • \textbf{Max dose 2 g daily}

NSAIDS and COX-2 Inhibitors Mechanism of Action

[Diagram showing the mechanism of action of NSAIDS and COX-2 inhibitors]

- Arachidonic acid
  - NSAIDS
  - Cyclooxygenase-1 (Cox-1)
  - Cyclooxygenase-2 (Cox-2)
  - NSAIDS, COX-2

- Endoperoxides (PGG\(_2\), PGH\(_2\))
  - Prostacyclin (PGI\(_2\))
  - Thromboxanes (TxA\(_2\))

- Prostaglandins (PGE\(_1\), PGE\(_2\))
NSAID Selection

• All are equianalgesic at proper doses

• Potential toxicity is similar between agents

• Ketorolac: IV NSAID for pain
  – Maximum duration 5 days

• Previous response history

• Cost and compliance

NSAID Adverse Effects

• Bleeding
  • Aspirin irreversibly inhibits platelet function (bleeding time takes 5-7 days to normalize)
  • Other NSAIDs reversibly inhibit COX-1 dependent thromboxane production in platelets

• Renal toxicity
  • Acute renal insufficiency
  • Direct toxicity and inhibition of local prostaglandins causing vasodilation

• Dyspepsia (take with food)

• Pregnancy
  • Avoid during 3rd trimester of pregnancy
NSAIDs: GI toxicity

- Ulcer (gastric, duodenal)
  - Misoprostol or PPI used if long term therapy required or increased risk of GI toxicity

- Risk Factors for NSAID-induced ulcer
  - Age > 60 years, chronic illness, previous ulcer
  - High-dose NSAIDs and the choice of NSAID
  - Concomitant use of steroids or aspirin (even low dose)
  - Concomitant anticoagulation, antiplatelet therapy

- Use of buffered or enteric-coated aspirin does not decrease the risk of GI ulcer or complication

COX-2 Inhibitors

- Selectively inhibits COX-2

- Less GI ulcer and bleeding

- May increase cardiovascular risk
  - Black box warning for thrombotic events, myocardial infarction, and stroke

- Celecoxib 100-200 mg daily
  - Max = 400 mg/day
Summary of Step 1

- Non-opioid analgesic +/- adjuvant
- Dose around the clock for chronic pain and consider max dose for each agent
- APAP
  - No anti-inflammatory action or antiplatelet action
- NSAIDs
  - Selection based on toxicity, dosing and cost
  - Caution in renal insufficiency, heart failure, and diabetes
- COX-2 Inhibitors
  - Decreased GI toxicity and convenience of daily dosing
Step 2 & 3: Addition of Opioid

Opioid General Principles

- Choose appropriate route
- Use equianalgesic dosing
- Individualize plan
- Give around the clock
- Start with lowest dose (esp. in the elderly)
- Titrate quickly
- No ceiling dose
- Use PRN doses for breakthrough
- Understand tolerance and dependence vs. addiction
- Anticipate & manage adverse effects
- Use same opioid for short-acting and extended release
Opioid Dosing and Titration

• For patients who have intermittent pain with pain-free intervals, IR opioids can be administered on an “as needed” basis with the exception of methadone
• If a patient persistently requires doses of “as-needed” opioids, or if the “around-the-clock” opioid regimen fails to relieve pain at peak effect or at end of dose, ER opioids should be considered

Opioid Tolerance

• FDA statement
  • Patients considered opioid tolerant are those who are taking at least
    • 60 mg oral morphine/day
    • 25 mcg transdermal fentanyl/hour
    • 30 mg oral oxycodone/day
    • 8 mg oral hydromorphone/day
    • 25 mg oral oxymorphone/day
    • Or an equianalgesic dose of another opioid for one week or longer
  • Otherwise considered opioid naive

NCCN. Adult Cancer Pain. V.2.2019
Tramadol

- Non-narcotic analgesic, works centrally on $\mu$-opioid receptors
- Weak inhibition of norepinephrine and serotonin reuptake
- Adverse Effects:
  - Dizziness, HA, vertigo, constipation, nausea, change in CNS function, dry mouth, urinary retention, tremor, seizures
- Increased risk of serotonin syndrome if:
  - Used with other drugs inhibiting reuptake of serotonin or drugs inhibiting metabolism of tramadol (CYP3A4 or CYP2D6)
  - Be cautious in patients with renal insufficiency or liver failure

Tramadol

- Schedule IV controlled substance
- Accepted medical use to manage moderate to moderately severe pain
- Abuse of tramadol may lead to limited physical dependence or psychological dependence
Opioid Analgesics

1. **Pure agonists**: full activity at opioid receptor (mu receptor-analgesia; kappa-spinal analgesia, sigma-dysphoria)
   - Morphine, oxycodone, hydromorphone, fentanyl
2. **Mixed agonists/antagonists**: competes with agonists for opiate receptor sites
   - Pentazocine, butorphanol, nalbuphine, buprenorphine
3. **Antagonists**: binds competitively to opioid receptors but does not produce an analgesic response
   - Naloxone

**Morphine**

- Gold standard for chronic severe pain
- In a patient who has not been exposed to opioids, morphine is generally considered starting drug of choice
- Many dosage forms (IV, PO, PCA, IM, long-acting)
  - Significant first-pass effect when given PO
- Active metabolite accumulates in renal failure
  - Morphine-6-glucuronide
- Allergy:
  - Meperidine and fentanyl are not cross-reactive

Morphine Dosing

- Opioid Naïve
  - 15 mg PO q4h
  - 2-4mg IV q4h
- Oral to IV ratio is 3:1
- Ideally initiate in an inpatient setting, assess for efficacy and adverse events every 60 minutes for orally administered opioids and every 15 minutes for IV opioids to determine a subsequent dose

Oral ER Morphine products

- 24-hour capsules
  - Kadian®
  - Generic
  - MAY be dosed Q12 hours...but main labeling and guidelines are for Q24h
    - Don’t hesitate to double-check!
Oral ER Morphine products

• 12-hour tablets
  • MS Contin and genetic
    • In oncology setting we occasionally dose Q8h
  • MorphaBond ER
    • Lower Cmax than MS Contin when crushed and taken intranasally
  • Arymo ER
    • Guardian technology – resistant to physical manipulation like crushing

Oxycodone

• Similar place in therapy as morphine
  • Slightly different potency: 20mg PO oxycodone = 30mg PO morphine
• Oral form only (long-acting available)
• Combination products available with APAP (Percocet)
• Starting dose
  • 5-10 mg PO q 4-6h
• Recommended for patients with renal dysfunction
Oral ER Oxycodone Products

- 12-hour tablets
  - OxyContin and generic (?)
  - Xtampza ER
    - DETERx microsphere technology – crushing, chewing, or snorting the contents of the capsule will not increase plasma concentration of oxycodone
    - Not a 1:1mg conversion with other oxycodone products

Hydrocodone

- 1:1 potency with morphine
- Combination product with APAP
  - 5, 7.5, 10mg with 325mg APAP
- Oral ER Products
  - 12-hour capsule
    - Zohydro ER – Beadtek technology
  - 24-hour tablet
    - Hysingla ER – Resistec technology
Hydromorphone (Dilaudid®)

- Hydromorphone is 7 times more potent than morphine
- Less pruritis than morphine
- Available IV or PO
  - Oral/IV = 5:1
- IV formulation can be used in PCA
- $C_{\text{max}}$ and AUC increased in renal dysfunction
- Long acting PO form available, Q24 hour dosing
  - Exalgo® available in 8, 12, 16 and 32 mg strength

Oxymorphone (Opana®)

- 3x more potent than morphine
- IR and ER formulations
- ER tablets formulated for Q12 hour dosing
- Generic
Fentanyl

- Very potent analgesic (mcg vs. mg)
- Non-cross reactive with morphine allergy
- Dosage forms
  - Sublimaze® (IV)- reserve for acute pain/sedation
  - Actiq® lollipops & Fentora® lozenge
    - Breakthrough treatment of severe cancer pain
    - Contraindicated for acute or postoperative pain
    - Contains enough medication to be lethal to a child or opioid naïve adult
  - Abstral® immediate-release transmucosal tablet
  - Duragesic® patch
  - Lozanda® nasal spray
  - Subsys® sublingual spray

Fentanyl (Duragesic®) Patch

- Onset of action: 12-24 hours, duration 72 hours
  - Patch is changed every 3 days
- Patients with chronic, stable baseline pain
  - Unable to tolerate PO
- Opioid naïve patients: must start at 25 mcg/h patch
- Do not apply heat (caution with fever)
- Disposal
  - Fold over and flush down toilet
Methadone

- Used for chronic pain and also to treat opiate addiction
- Variations in pharmacokinetics (long $t_{1/2}$ 8 to > 120 h)
  - Extended duration of action
- Equianalgesic dose of methadone may decrease with higher doses of previous opioid
  - Per NCCN Guidelines: “Due to its long half-life, high potency, and inter-individual variations in pharmacokinetics, methadone should be started at doses reduced by at least 50% from the calculated equianalgesic dose and slowly titrated upwards with the provision of adequate short-acting breakthrough medications during titration.”
- Start with low dose and slowly titrate
### Other Opioids

- **Codeine**
  - Also used as an antitussive
  - Greater risk of adverse effects at doses above 1.5 mg/kg
- **Meperidine (Demerol®) PO, IM, SQ, IV**
  - Short duration of action
  - Normeperidine metabolite
    - Long half-life, accumulates (esp renal dysfunction), causes seizures
    - Many drug interactions
    - Pancreatitis
- **Opioid agonist/antagonists**
  - Can precipitate withdrawal in opioid-dependent patients

### Adverse Effects of Opioids

- **Itching**
  - Diphenhydramine
- **Nausea**
  - PRN antiemetic (promethazine, compazine)
- **Delirium**
- **Sedation**
  - Titrate dose to effective level
- **Respiratory Failure:**
  - Risk factors: Sleep apnea, severe renal or hepatic dysfunction, opioid naïve, concurrent use of sedating medications, moderate to severe pre-existing respiratory disease
  - Treatment: naloxone

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Naloxone (Narcan)

- Opioid antagonist
  - Useful in opioid overdose
- Dose
  - 0.4 mg IV q 3-5 minutes PRN respiratory depression
    - Caution full reversal
  - 4 mg (contents of one nasal spray) as a single dose in one nostril, may repeat every 2-3 minutes in alternating nostrils
    - Call for medical assistance
- 535:10-9-15 (c): A Pharmacist may prescribe and dispense Naloxone without a protocol or prescription to any person at risk of experiencing an opioid-related drug overdose, family or friend of an at-risk person, or first responder.

Adverse Effects of Opioids

- Constipation
  - This is only AE where tolerance does not develop
  - Initiate prophylactic bowel regimen (stimulant laxative + stool softener)
    - Docusate alone not effective
  - Titrate laxatives to achieve one non-forced bowel-movement every 1-2 days
  - Methylaltrexone, naloxegol
    - Opioid antagonists in peripheral tissues, methylation prevents crossover into CNS therefore doesn’t cause withdrawal of pain control
Summary

• Start with the lowest dose, titrate quickly and include a regimen with scheduled and prn meds

• If a patient is changing opioid therapy, use equianalgesic dosing, but consider incomplete cross-tolerance

• There is no ceiling dose for opioids

• Constipation is the only adverse effect that tolerance does not develop
  • Start a bowel regimen

• Tolerance & dependence will develop with chronic opioid use
Changing Opioids

• Calculate current dose in morphine equivalents per day
  • Cross-tolerance is not 100%, reduce dose by 25-50% to allow for incomplete cross-tolerance
    • If previous dose was ineffective, may begin with 100% of equianalgesic dose or increase that by 25%
  • Tables are not always accurate
  • Pharmacokinetics can be variable
  • Make sure plan seems reasonable

• Divide 24 hour dose as appropriate for formulation

PRN Dosing

• 10-20% of 24 hour total scheduled dose

• Give every 3-4 hours

• Example: MS Contin 60 mg PO Q 12h
  • PRN Dose: 12-24 mg PO q 3-4 h prn pain
### Equianalgesic Opioid Dose Conversion

<table>
<thead>
<tr>
<th>Drug</th>
<th>IV</th>
<th>PO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>10 mg</td>
<td>30 mg</td>
</tr>
<tr>
<td>Codeine</td>
<td>130 mg</td>
<td>200 mg</td>
</tr>
<tr>
<td>Fentanyl (IV or IM)</td>
<td>0.1-0.2 mg IV</td>
<td>N/A</td>
</tr>
<tr>
<td>Transdermal Patch</td>
<td>100 mcg/day</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>patch =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>150-300 mg PO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>morphine</td>
<td></td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>N/A</td>
<td>30 mg</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>1.5 mg</td>
<td>7.5 mg</td>
</tr>
<tr>
<td>Meperidine</td>
<td>75 mg</td>
<td>300 mg</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>N/A</td>
<td>20 mg</td>
</tr>
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<td>Oxymorphone</td>
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<td>10 mg</td>
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### Adjuvant Treatment Options for Specific Pain Syndromes
Neuropathic Pain

• Results from damage to the central or peripheral nervous system

• In general, NSAIDs and opioids are less responsive in this pain syndrome

• No studies have demonstrated superiority of one drug over another

• Agents:
  • Anticonvulsants
  • Antidepressants

Anticonvulsants

• Gabapentin (Neurontin)
  • Most common anticonvulsant used
  • Wide dose range
    • Start low (100 mg BID or TID)
    • Maximum 3600 to 4800 mg/day
    • Must adjust for renal function
  • Side effects
    • Somnolence, ataxia, vertigo, headache

• Other agents: pregabalin, carbamazepine
Antidepressants

- Tricyclic Antidepressants
  - TCAs provide some relief in 60% of patients
  - May produce intolerable side effects before benefit
  - Start with low dose and increase every 3-5 days
  - Many drug interactions
  - ADRs:
    - Weight gain, sedation, orthostatic hypotension, urinary retention, rare cardiac conduction problems

- Common agents:
  - Amitriptyline: 25 mg HS (max dose = 100 mg)
  - Venlafaxine: 37.5 - 225 mg/d divided in 2-3 doses
  - Duloxetine: 30-60 mg/d

Lidocaine Patch

- Topical agent provided local anesthesia
- Useful for neuropathic pain or localized pain
- Minimal systemic absorption
- Can apply up to 3 patches
- 12 hour free period
Bone Pain

• Malignancies to bone
  • NSAID first line therapy
  • Corticosteroids
  • Bisphosphonates

• Osteoarthritis
  • APAP first line therapy

Patient Case #2

• RT is a 60-year-old male with castration-resistant prostate cancer metastatic to his liver and bones. He is currently receiving treatment with cabazitaxel chemotherapy and presents for a pre-chemo visit. He complains of grade 2 peripheral neuropathy, and pain in his hips and spine (consistent with location of bone lesions).

• His current pain medication regimen is as follows:
  Morphine sulfate ER 15mg PO BID
  Morphine sulfate IR 15mg Q6H PRN pain
Patient Case #2

• RT states he’s taking his ER morphine as prescribed and consistently using his IR morphine every 6 hours to achieve tolerable pain relief, and even then it remains around a 4/10.
• He also reports severe itching since starting the morphine, and wonders if there’s an alternative product. He has used oxycodone/APAP in the past without issue.

Would you recommend any changes to his opioid regimen?

Patient Case #2

• Which of the following would you recommend as an updated regimen for RT?
  
  A. Fentanyl 100mcg patch Q72 hours
  B. Morphine sulfate ER 30mg PO BID and morphine sulfate IR 15mg Q6H PRN pain
  C. Oxycodone/APAP 10/325 tablets, 2 PO Q6H PRN pain
  D. Xtampza (oxycodone) ER 13.5mg capsules, 2 PO BID and oxycodone IR 10mg PO Q6H PRN pain
Patient Case #2

A. Fentanyl 100mcg patch Q72 hours – incorrect. This dose is too potent when using equianalgesic dosing (25 mcg patch would be appropriate), and this choice doesn’t contain any breakthrough medication.

B. Morphine sulfate ER 30mg PO BID and morphine sulfate IR 15mg Q6H PRN pain – incorrect. This is likely not a sufficient increase in dose to achieve adequate pain control. The patient is currently taking 90mg morphine sulfate per day without complete pain relief. He also reports bothersome AE’s with morphine.

C. Oxycodone/APAP 10/325 tablets, 2 PO Q6H PRN pain – incorrect. This regimen lacks a long-acting formulation, and in a chronic pain setting it’s best to avoid APAP-containing products.

Step 1: Calculate current total daily dose in oral morphine milligram equivalents:

Morphine ER 15mg PO BID = 30mg of long acting
Morphine IR 15mg PO Q6H = 60mg of short acting

24 hour daily dose = 90mg oral morphine
Equianalgesic Opioid Dose Conversion

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Patient Case #2

30mg PO morphine = 90mg PO morphine
20mg PO oxycodone = ? mg PO oxycodone

Patient wasn’t quite achieving complete pain control on this dose, but due to incomplete cross-tolerance, I would start here without increasing it at this time.
Patient Case #2

- 60mg oxycodone as long-acting baseline pain control:
  - 30mg PO BID OxyContin (or generic)
    - I've had difficulties getting this-insurance/availability
  - 13.5mg capsule Xstema ER is equivalent to 15mg oxycodone hydrochloride
    - 2 capsules Xstema ER to achieve equivalent of 30mg oxycodone ER, dosed BID for 60mg daily dose
  - PRN is 10-20% long-acting dose
    - 6mg-12mg oxycodone IR, available in 10mg tablets
    - 10mg oxycodone IR PO Q6H PRN pain
  - Reassess frequently

Patient Case #2

- What would you recommend for RT’s neuropathic pain?
  A. Ibuprofen 600mg PO TID
  B. Gabapentin 1200mg PO TID
  C. Duloxetine 30mg PO Daily
  D. Dexamethasone 8mg PO QAM
Questions?