POCKETBOOK TOOLKIT

Pain Management

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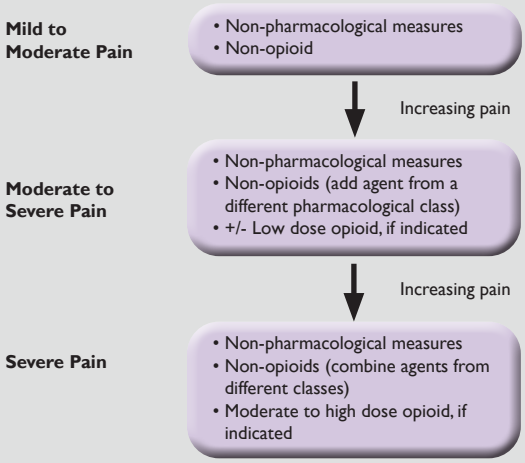
Pain Management Introduction

The tools and information in this pocket guide are provided to assist pharmacists in serving the medication needs of patients with acute and chronic pain. This information is not to be used as a substitute for professional training and judgment. Use of this information indicates acknowledgment that neither PSW nor its contributing authors will be responsible for any loss or injury, including death, sustained in connection with or as the result of using this information. When making judgments regarding specific medications, pharmacists should consult the complete information available in the product prescribing information or other published literature as appropriate. PSW is under no obligation to update information contained herein.

Thanks to Tresa Binek and PSW Practice Advancement Leadership Team for assistance in review of this toolkit

Figure 2. Multimodal treatment plan for pain management



Acetaminophen[6-8]

1. Reduces pain by 20-40% for acute indications such as in surgery or injuries when administered around-the-clock
3. 3.7-fold increased risk of reversible LFT elevation with chronic dosing (>12 weeks of 4g/day, consider lower 3-3.2g/day for chronic dosing).
4. Avoid chronic dosing in severe hepatic impairment, for intermittent dosing consider lower 2g per day limit
5. Minimal efficacy for many chronic pain conditions, chronic use increases risk of medication-overuse headaches

NSAIDs[9-16]

1. Reduces pain by 40-50% for acute indications when administered scheduled, around-the-clock
2. For inefficacy with 1 NSAID, chose an NSAID from a different structural class
3. For noncompliance, to reduce frequent daily redosing, chose an NSAID with a longer half-life for once daily dosing (meloxicam, piroxicam, nabumetone, oxaprozin)
4. Do not combine >1 NSAID concomitantly to prevent adverse effects
5. Avoid NSAID co-administration with turmeric, corticosteroids, anticoagulants, and use caution with antiplatelet therapy
6. Risk of adverse effects is dose-dependent. Use lowest effective dose ≤50% of maximum daily dose for shortest time period
7. Screen for risk of NSAID-induced adverse effects:
   a. NSAID-induced gastropathy, refer to Table 1: NSAID Selection Tool Based on Ulcer & Cardiac Risk Assessment
   b. NSAID-induced cardiovascular disease, refer to Table 1: NSAID Selection Tool Based on Ulcer & Cardiac Risk Assessment
   c. NSAID-induced AKI:
      i. COX-1 (eg. ketorolac, indomethacin) higher risk than COX-2 selective (eg. etodolac, diclofenac, celecoxcib)
      ii. **Use with caution:** hypertension, age > 65, admitted to intensive care
      iii. **Avoid:** advanced kidney disease, cirrhosis, concomitant nephrotoxins (diuretics, ACE-I/ARB, aminoglycosides)
8. Topical local NSAIDs are alternatives to systemic NSAID therapy for those with contraindications; systemic exposure is reduced by 90-99%

Pain Assessment and Treatment Plan

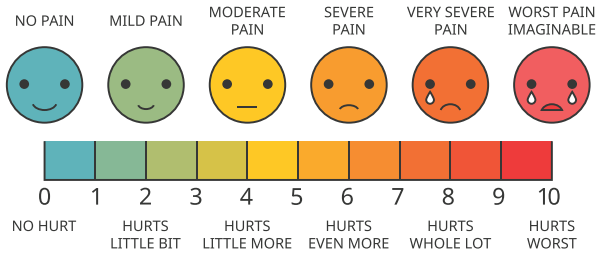
Pain is an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage or described in such terms. International association for the study of pain. IASP pain terminology (http://www.iasp-pain.org/index.aspx)

STEP 1: Assess Pain and Analgesia (OPQRSTU)[1-5]

[O]nset: What were you doing when pain onset? When did it onset?
[P]rovokes: What is the cause of your pain? What makes it better and/or worse?
[Q]uality: What does your pain feel like?
- Nociceptive – pressure, sharp, stabbing, pulling
- Inflammatory – aching, cutting, sharp, sore, dull, throbbing, tight
- Neuropathic – burning, numbness, searing, radiating, shooting
- Visceral – cramping, dull aching, radiating
- Patients often have more than one type of pain

[R]adiates: Is your pain localized to one place? Does the pain start in one location and travel to another location?
[S]everity: i.e.: 0-10 Numeric Rating Scale, for verbal adults, or Faces Scale (Figure 1) for children.
[T]iming: When did the pain start? How long does each pain episode last? How often do you have pain episodes? Is pain more likely to occur during a certain time of day?

Figure 1. Wong-Baker FACES® Pain Rating Scale



[U] How does pain affect you: What functional activities are you unable to do due to pain?

STEP 2: Assess impact of pain on patient's activities: How does the pain limit your function?
STEP 3: Review physical exam, patient history, medication list, and previous medication or therapy trials
STEP 4: Assess presence of adverse effects or aberrant behaviors from previous therapies
STEP 5: Define treatment goals with patient
- Acute: facilitate recovery, decrease pain to an acceptable level, improve healing and function, and prevent chronic pain
- Chronic (pain persisting for at least 3 – 6 months): improve function, decrease pain to an acceptable level, correct secondary consequences of pain: overuse injuries, weakness, poor postures, maladaptive behavior, coping
- Goals of therapy - balance analgesia with restoration of function or to prevent functional decline

STEP 6: Develop a multimodal treatment plan and/or adjust current regimen:
- Use balanced, multi-modal treatment plans: Start with non-opioids, then add short-acting opioids if needed for acute exacerbations not relieved by multimodal therapy. For acute non-cancer conditions, short-acting opioids are preferred, and long-acting opioids should be reserved for cancer or severe pain. Some non-pharmacological measures include: heat/cold, physical therapy, meditation, massage, acupuncture, biofeedback, trans-electrical nerve stimulator (TENS), psychological counseling
- Avoid opioids for patients with chronic non-cancer pain such as fibromyalgia, back pain or migraine
- Oral medications are preferred over parenteral due to the longer duration and avoid peaks and valleys in analgesia. Avoid intramuscular injections.
- Assess pain, pain relief, and side effects frequently and adjust drug doses accordingly. Change to another drug if side effects are unmanageable.

Table 1. NSAID Selection Tool Based on Ulcer & Cardiac Risk Assessment[9-16]

Gastropathy is the highest ADE leading to NSAID discontinuation. Includes esophagitis, gastritis, gastric/peptic ulcers, duodenal ulcers. Severity ranges to mild to life threatening requiring hospitalization for transfusion. Time to onset = 4 weeks. H2RAs substantially less effective than PPI for prevention.		NSAID-induced myocardial infarction, NSTEMI, or stroke occur with COX-1 NSAIDs due to higher binding affinity than cardioprotective aspirin; rendering cardioprotective aspirin ineffective. COX-1 NSAIDs should be dosed 1 hour after when taken concomitantly with cardioprotective aspirin. To prevent inefficacy aspirin prophylaxis: chose a short-acting NSAID and dose aspirin 1 hour before the NSAID. Time to MI/CVA onset = 1-4 weeks.	
Gastropathy Risk		**Low Cardiac Risk**	**High Cardiac Risk* (on aspirin 81-325mg/day)**
Low Risk	No risk factors	Any NSAID	Naproxen + PPI
Moderate Risk (1-2 risk factors)	Age > 65	Any NSAID + PPI	Naproxen + PPI
	High dose NSAID		
	History uncomplicated ulcer		
	Concurrent use of aspirin (any dose) other antiplatelet therapy, corticosteroids, or anticoagulants		
High Risk	History of complicated ulcer	Avoid systemic NSAIDs; COX-2 + PPI if unable to avoid	Avoid NSAIDs & COX-2
	>2 moderate risk factors		

*includes pre-existing coronary artery disease (CAD). Also includes patients on other chronic antiplatelet therapy. *H. pylori* is an independent and ADDITIVE risk factor and should be eradicated prior to initiation of a chronic NSAID

Table 2. Strong Opioids: Pure μ Agonists for Acute and Chronic Pain[12,60]

Drug	Morphine				Hydromorphone	Fentanyl	Oxymorphone	Oxycodone				Hydrocodone	
Immediate Release (IR) Products: Dosing ranges vary and should be customized on a patient basis. Range orders should be started at low doses and titrated to relief. Dose outpatients, elderly, and patients <50kg more conservatively. Patients in an acute pain crisis, admitted to the hospital, or in a palliative care/hospice program may receive higher doses or be dosed more frequently until pain control can be achieved. For patients considered opioid-tolerant, dose based on clinical determination using an opioid equivalency chart. Refer to package insert for initial dosing.													
Equianalgesic Oral Dosing*			30 mg PO		7.5 mg PO		10 mg PO	20 mg PO				30 mg PO	
Equianalgesic Parenteral Dosing*			10 mg IV		1.5 mg IV	100 mcg IV	1 mg IV						
*Equianalgesic doses are approximate. The doses are based on single doses studies in acute pain. Decrease the calculated dose by 25-50% due to incomplete cross-tolerance. Consider additional dose reduction if converting from IV patient-controlled analgesia, the patient is medically fail or elderly, or if existing drug dose is very high. Aggressive dose reductions for cross-tolerance may not be needed in patients whom were on existing drug dose for a short period of time (ie: days), or who are in severe pain.													
Renal Disease	Avoid Use				Use with Caution	Safe to Use	Unknown	Use with Caution				Use with Caution	
Hepatic Disease	Use with Caution				Use with Caution	Use with Caution	Contra-indicated	Use with Caution		Contra-indicated	Use with Caution	Use with Caution	
Extended Release (ER) Products: It is rare to initiate opioid therapy with an extended-release product. Initial dosing listed below is for patients whom have recently trialed and tolerated an immediate release product. For patients considered opioid-tolerant, previously taking morphine ≥ 60mg/day for >7 days or equivalent dosing, dose based on clinical determination using an opioid equivalency chart.													
ER Product	**MS Contin®** 8-12 hour ER tab	**Kadian®** 12-24 hour ER cap	**Avinza®** 24 hour bi-modal ER cap	**Embeda®** 24 hour ER tab	**Exalgo®** 24 hour ER tab	**Duragesic®** 48-72 hour Transdermal patch	**Opana®** 12 hour ER tab	**OxyContin®** 8-12 hour CR tab	**Xtampza®** 8-12 hour ER cap	**Targiniq®** 12 hour ER tab	**Troxyca®** 12 hour ER tab	**Zohydro®** 12 hour ER cap	**Hysingla®** 12 hour ER tab
Abuse Deterrent Additive	-	-	-	naltrexone not active unless manipulated	-	-	-	-	-	naloxone not active unless manipulated	naltrexone not active unless manipulated	-	-
Initial Adult Dosing	15-30 mg PO every 8 to 12 hours	20 mg PO every 12 to 24 hours	30 mg PO once daily	20/0.8 mg PO every 12 to 24 hours	Reserve use for hydromorphone or opioid tolerant, see PI	Reserve use for opioid tolerant, see PI or fentanyl section	5 mg PO every 12 hours on an empty stomach	10 mg PO every 8 to 12 hours	9 mg PO every 12 hours	10/5 mg PO every 12 hours; see PI when converting	10/1.2 mg PO every 12 hours; see PI when converting	10 mg PO every 12 hours; see PI when converting	20 mg PO every 24 hours; see PI when converting
Can it be opened?	Do not alter tab	YES	YES, do NOT crush pellets inside	YES, do NOT crush pellets inside	Do not alter tab	Do not cut or alter patch	Do not alter tab	Do not alter tab	YES	Do not alter tab	YES, do NOT crush pellets inside	NO	NO
NGT/PEG compatibility	NO	NGT: NO PEG: YES	NO	NO	NO	Not applicable	NO	NO	NGT:YES PEG:YES	NO	NO	NO	NO
Other Pearls		Do not coingest alcohol^	Do not coingest alcohol^	Do not coingest alcohol^		Do not apply heat over patch site(s) Prone to drug-drug interactions with CYP 3A4 metabolism	Do not coingest alcohol^		Must be taken with food			Do not coingest alcohol^	

Definitions: opioid-tolerant: previously taking morphine ≥ 60mg/day for >7 days or equivalent dosing
Abbreviations: CR=controlled release, ER=extended release, IR= immediate release, IV=intravenous, NGT=nasogastric tube, PEG=percutaneous endoscopic gastrostomy, PI=package insert, PO=oral
^Co-ingestion with alcohol increases drug absorption and plasma concentrations, in addition to being classified a sedative and not recommended in combination with opioids.

Opioid Counseling Pearls:

- Opioids should be used sparingly as last line therapy as a part of a multimodal regimen that focuses on functional improvement.
- If you are prescribed an opioid, never use more than what is prescribed.
- Opioids cause drowsiness. Do not take alcohol or sedatives at the same time as taking opioids.
- Do not chew, cut, or break extended release dosage forms or patches.
- Distinguish between long-acting and short-acting opioids to prevent accidental mix-ups.
- Use oral syringes rather than teaspoons or tablespoons to accurately measure liquid medications.
- Do not use heating pads over medication patches or sites where a medication patch was recently removed.
- Co-prescribe naloxone to patients who qualify or those with children or teens in the household.
- Lock up opioids securely at all times away from children, teens, young adults, and pets.
- Never share opioids with others to prevent diversion.
- Dispose of unused medications through medication drop boxes as local police stations or through national take back programs.

Risks of Opioid Therapy

1. Opioid overdose by prescription recipient or household contacts.
2. Possible lack of return or improvement of function due to their depressant side effects when used chronically for non-cancer pain.
3. Development of tolerance that may require more opioids to help manage chronic pain, which increases side effect intensity and frequency.
4. Development of other side effects. Refer to Table 10: Systemic Adverse Effects of Opioids.

Table 3. Mixed Mechanism Opioids for Acute and Chronic Pain[12,60]

Drug	Tramadol	Tapentadol	Buprenorphine	Methadone
Mixed Mechanism of Action	Weak μ-receptor agonist & weak inhibition of norepinephrine & serotonin reuptake	Weak μ-receptor agonist & weak inhibition of norepinephrine reuptake	Weak μ-receptor partial agonist, kappa antagonist, delta agonist, ORL-1 partial agonist	Strong μ-receptor agonist & NMDA receptor antagonism
Immediate Release (IR) Products: Dosing ranges vary and should be customized on a patient basis. Range orders should be started at low doses and titrated to relief. Dose outpatients, elderly, and patients <50kg more conservatively. Patients in an acute pain crisis, admitted to the hospital, or in a palliative care/hospice program may receive higher doses or be dosed more frequently until pain control can be achieved. For patients considered opioid-tolerant, dose based on clinical determination using an opioid equivalency chart. Refer to package insert for initial dosing.				
Equianalgesic Oral Dosing*	undetermined	undetermined		varied
Equianalgesic Parenteral Dosing*			0.3mg IV/IM	Oral Bioavailability 36-100%; reduce IV dose by 30-50%
*Equianalgesic doses are approximate. The doses are based on single doses studies in acute pain. Decrease the calculated dose by 25-50% due to incomplete cross-tolerance. Consider additional dose reduction if converting from IV patient-controlled analgesia, the patient is medically fail or elderly, or if existing drug dose is very high. Aggressive dose reductions for cross-tolerance may not be needed in patients whom were on existing drug dose for a short period of time (ie: days), or who are in severe pain.				
Renal Disease	Avoid Use	Avoid Use	Safe to Use	Safe to Use
Hepatic Disease	Use with Caution	Use with Caution	Avoid Use	Use with Caution
Extended Release (ER) Products: It is rare to initiate opioid therapy with an extended-release product. Initial dosing listed below is for patients whom have recently trialed and tolerated an immediate release product. For patients considered opioid-tolerant, previously taking morphine ≥ 60mg/day for >7 days or equivalent dosing, dose based on clinical determination using an opioid equivalency chart.				
ER Product	**Ultram ER®** 24 hour ER tablets	**Nucynta ER®** 12 hour ER tablets	**Butrans®** Transdermal weekly patch	IR product has long half-life and at steady state behaves like ER products
Abuse Deterrent Additive	-	-	-	-
Initial Adult Dosing	• Tramadol naïve: 100 mg once daily • On tramadol IR: use 24-hour dose and round down to lowest 100 mg • Do not exceed 300 mg per day	• 50 mg PO twice daily • Do not exceed 500 mg per day • Do not to exceed 100 mg per day in hepatic impairment	• <30 mg PO MME/day: 5 mcg/hour • 30-80 mg PO MME/day: 10 mcg/hour • >80 oral MME/day: consider alternative • Do not exceed 20 mcg/hour	• Reserve use for opioid-tolerant when other opioids have failed • Recommend initiation and titration by pain specialist • 2.5 to 5 mg twice daily • Do not exceed 30-40mg per day initially with dose conversions
Can it be opened?	Do not alter tab	Do not alter tab	Do not cut or alter patch	OK to crush tab, oral solution also available
NGT/PEG Compatibility	NO	NO	Not applicable	NGT & PEG: YES. Ok to crush tab and oral and IV solution available
Other Pearls	• Mixed mechanism may improve efficacy in neuropathic conditions • Caution with seizure disorder(s) • Caution with other serotonergic drugs • Lowers seizure threshold; avoid use in seizure disorders	Mixed mechanism may improve efficacy in neuropathic conditions	• Stronger binding affinity to μ-receptor than all other opioids, but only produces partial response. • Consider halting therapy for surgery, trauma, or hospitalization requiring intensive pain management.	• Mixed mechanism may improve efficacy in neuropathic conditions • Prolongs QTc; worse with IV • Prone to drug-drug interactions with CYP 3A4 metabolism • Caution with other serotonergic drugs

Table 4. Opioid Dose Titration[60]

Intended for acute pain management in supervised settings. For opioid naïve outpatients, start opioids at package insert recommended dosages with ranges allowed for titration, use in combination with multimodal therapy. Functional goals of therapy should be established. Pain score reductions of 30-50% from opioid therapy are expected. Higher reductions in pain are associated with potentially harmful adverse effects.

Oral	Intravenous Infusion	IV Patient-controlled analgesia (PCA)
1. Increase the dose until either analgesia or intolerable side effects occur by titrating upwards at increments of 25-100% at subsequent dosing intervals. Peak drug effect occurs within 1 to 1.5 hours after oral administration of short-acting opioids. Therefore, it is safe for patients to take a second opioid dose for unrelieved pain 1 to 2 hours after the first dose if side effects are tolerable. 2. If patient is chronically managed with long-acting opioids, recommend "as needed" rescue doses to be no less than 10% of total daily dose of long-acting regimen. 3. Do not titrate long-acting oral regimens (oxycodone, morphine) more frequently than every 24 hours. Fentanyl patches and methadone should not be titrated sooner than 6-7 days. 4. Immediate release opioid should be available to patients for break through pain when titrating and waiting steady state of long-acting formulations.	1. Give a loading bolus dose at the start and with each increase in basal rate. Administer the loading dose slowly and observe vital signs frequently after each loading dose; i. 100-150% of established starting hourly dose 2. Administer frequent RN bolus doses for pain that is uncontrolled. 3. Avoid escalating the continuous basal dose more frequently than every 8 hours. When increasing doses of parenteral infusions, do not increase basal rate more than 100% at any one time, irrespective of how many bolus/breakthrough doses have been used. 4. Full effects of initiating or increasing a continuous basal dose (without first administering a loading dose) will not be seen until steady state, approximately 5 half-lives.	1. PCA is intended to maintain analgesia after a loading dose 2. Patient initiated doses (PID) are generally set for every 8-15 minutes. 3. The PRN nurse bolus is usually twice the patient-initiated dose PID or equal to the hourly basal rate. 4. When PID is used with a basal dose, the PID should be half the hourly basal rate. 5. Hourly limit is generally 3-5x the PID.

Table X. Patient-controlled analgesia (PCA) dosing

Patient	Drug	Usual PID range
Pediatric (less than 50kg)	morphine	0.01 - 0.03 mg/kg/dose
	hydromorphone	3 - 4 mcg/kg/dose
	fentanyl	0.5 - 1 mcg/kg/dose
Adult - opioid naïve	morphine	0.5 - 2.5 mg
	hydromorphone	0.05 - 0.4 mg
	fentanyl	10 - 12 mcg
Adult - opioid tolerant	morphine	2 - 5 mg
	hydromorphone	0.4 - 0.6 mg
	fentanyl	25 - 50 mcg

Table 5. Fentanyl Transdermal Patch Conversions[60,63-64]

Fentanyl patch requires at least 12 hours for analgesic effect and 24 hours to reach early steady state. Avoid titration sooner than 3 days with first patch and 6 days with subsequent patches. Avoid multiple patches if possible, in-between patch strengths now available. Elimination is affected by many drug interactions due to CYP3A4 metabolism; screen for potent CYP inducers or inhibitors. After patch removal, serum concentrations decline gradually to approximately 50% in 17 hours. After patch removal, 50% of patch contents still present. Fentanyl patches are reserved for opioid-tolerant patients.

Conversion TO fentanyl patch Conversion is dependent upon the direction of the conversion	Conversion FROM fentanyl patch Conversion is dependent upon the direction of the conversion	Fentanyl Continuous IV Infusion to Fentanyl Patch
1. Calculate 24-hour opioid equianalgesic dose 2. Do NOT decrease for cross tolerance 3. Refer to package insert for conversion TO fentanyl patch (accounts for cross tolerance) • Dosing is conservative, use PRN IR breakthrough x 2 patch cycles 4. Take the last dose of the previous ER formulation at the same time of fentanyl patch placement	1. Conversion FROM fentanyl patch to oral morphine: • 1 mcg/hour fentanyl = 2 mg per day of oral morphine • 25mcg/hour fentanyl = 50mg per day oral morphine 2. Remove fentanyl patch 8-12 hours after first dose of new ER opioid formulation	1. Fentanyl transdermal patch delivery at steady state is equivalent to the rate of infusion (i.e. 50mcg/hour infusion = 50mcg/hour patch) 2. Wean rate of infusion rate by 50% for 6 hours after fentanyl patch placement 3. Discontinue fentanyl infusion at 6 hours after fentanyl patch placement

Opioid Dose Conversions for Equianalgesic Dosing[60]

Used to change a patient to a different opioid than currently administered. Not universally required when converting from opioid naïve parenteral to opioid naïve oral doses. Consider opioid conversion when opioid requirements are high, or pain is severe at time of conversion. Dosing ranges vary and should be customized on a patient basis. Range orders should be started at low doses and titrated to relief. Dose outpatients, elderly, and patients <50kg more conservatively. Patients in an acute pain crisis, admitted to the hospital, or in a palliative care/hospice program may receive higher doses or be dosed more frequently until pain control can be achieved. For patients considered opioid-tolerant, dose based on clinical determination using an opioid equivalency chart. Refer to package insert for initial dosing.

Opioid Conversion Calculation

$$\frac{\text{24 hour dose of current opioid}}{\text{opioid equivalency dose of current opioid}} \times \text{Opioid equivalency table dose for new opioid} = \text{24 hour equianalgesic dose}$$

Calculating Approximate 24-hour Equianalgesic Dose

1. Calculate equivalent dose of new opioid
2. Multiply the equianalgesic dose by 0.5 (50% dose reduction) or 0.75 (25% dose reduction) to accommodate for incomplete tolerance
   - Decrease dose by more if pain is well controlled, if converting from IV to PO, or if patient is at risk for opioid overdose
   - Decrease dose by less if pain is poorly controlled
3. Divide 24-hour new analgesic dose by the appropriate number of doses per day to obtain analgesic dose

Milligrams of Morphine Equivalent (MME) Conversions

Used to compare opioid potency across the opioid drug class to assess for harm and scope of dose. NOT to be used for patient-based opioid conversions. Patients prescribed high MME (≥50 MME) and very high (≥90MME) are at increased risk of opioid overdose death. Patients prescribed these dose ranges should have increased monitoring, assess for need for dose de-escalation if lack of improvement in functional goals and be offered naloxone rescue dose for the home. Doses ≥90 MME should be avoided in non-cancer pain, or carefully justified, or reserved for malignant or end-of-life pain. These dose conversions are estimated and cannot account for all individual differences in genetics and pharmacokinetics.

- Centers for Medicare & Medicaid Services (CMS) MME Conversion Factors: Electronic hyperlink available in supplement. Scan QR code for accessibility.[61]
- Oregon Pain Guidance Opioid Conversion (MME) Online Calculator: Electronic hyperlink available in supplement. Scan QR code for accessibility.[62]

Methadone Conversions[60,65-67]

Extensive tissue distribution of methadone leads to a long and variable elimination half-life (24-72 hours). This allows every 8-hour dosing to act as both an immediate release and long acting agent without the need for additional opioids. Elimination is affected by many drug interactions due to CYP3A4, CYP2B6, and CYP2C19 metabolism; screen for potent CYP inducers or inhibitors. Titration must be slow due to long half-life, use PRN IR breakthrough while waiting steady state. Conversion ratio from other opioids is NON-LINEAR and is dependent on the direction of conversion. Methadone is associated with an increased risk of prolonged QTc intervals, Torsade de Pointes, and sudden death. Evaluate EKG for prolonged QTc prior to initiation and with dose escalation or addition of other QTc prolonging medications or disease states (crediblemeds.org/). Avoid exceeding 30mg-40/day with initial dose conversion.

Table 6. Conversion from oral morphine TO methadone*
Conversion is dependent upon the direction of the conversion

Morphine Equivalent Daily Dose (mg/day)	Morphine / Methadone Ratio	Maximum Initial Methadone Dose (mg/day)
< 600 mg/day	10:1	30 mg
601 – 1000 mg/day	20:1	40 mg
1001 – 2000 mg/day	30:1	40 mg
2001 – 3000 mg/day	40:1	40 mg

*ratios not accurate when CYP inducers or inhibitors co-administered with methadone
*Use in opioid naïve is uncommon but starting doses of 2.5-5mg/day have been used successfully (2.5mg at bedtime or 2.5mg twice daily)
*dose escalation may be considered after reaching steady state ~7 days after initating methadone

Table 7. Conversion FROM oral methadone TO oral morphine.
Conversion is dependent upon the direction of the conversion

1. Conversion ratio generally accepted as 1:3; although data to support the conversion is limited as conversion from methadone is not common.
2. Consider patient's opioid requirements pre-methadone and globally assess how/if their pain situation has changed. Would advise against opioid doses less than that of pre-methadone opioid requirements unless pain is improved.
3. Ratio for ORAL methadone TO ORAL morphine only

Methadone Daily Dose (mg/day)	Methadone / Morphine Ratio	Morphine Equivalent Daily Dose (mg/day)
20 mg	1:3	60 mg

*ratios not accurate when CYP inducers or inhibitors co-administered with methadone

Table 8. Systemic Adverse Effects of Opioids[68-73]

Adverse Effects	Treatment Strategies
Constipation - Most common side effect (80-100%), likely dose-related and due to reduced motility, decreased secretions, and reduced blood flow to the gut. Tolerance is never expected to develop to constipation. Therefore, all patients receiving opioids should anticipate developing constipation; therefore, patients without a contraindication should receive prophylactic laxatives with opioids	• Scheduled/prophylactic use: Senna/docusate and polyethylene glycol powder given initially as 1x-2x daily and then titrated to response • Rescue agents (PRN initially, may be scheduled if needed): Lactulose, milk of magnesia, magnesium citrate, bisacodyl, enemas • Last-line agents (for those failed first line therapy): alvimopan, lubiprostone, methylnaltrexone, naldemedine, naloxegol
Nausea - incidence 25%, transient	• First-line: co-administration with food or dose reduction, if possible • Second-line: prochlorperazine or haloperidol • Third-line: metoclopramide or ondansetron
Pruritis - incidence 2-10%, higher with spinal administration	• First-line: diphenhydramine or hydroxyzine • Second-line: doxepin or paroxetine • Consider nalbuphine or low dose naloxone infusions for spinal opioids
Respiratory depression - incidence varies; may occur with large initial doses, rapid dose titration, use of heroin or in over dose. • Decreased rate (less than 8 breaths/minute) and depth of respirations • Unarousable, or unable to stay awake when stimulated • Increased risk with concomitant use of sedatives, underlying disorders of the lungs/respiratory tract (e.g., severe COPD or asthma, sleep apnea), advanced age, or debilitation	• Naloxone IV/IM/SQ/Intranasal • Inpatient settings: use low doses (0.1mg q5min) and titrate to effect • Consider naloxone infusion for long-acting opioid ingestions • Ambulatory settings: used fixed doses provided by manufacturer. Call 911 or seek emergency care if used. Dose may be repeated while wait for arrival of EMS.
Withdrawal - incidence varies, 100% incidence following abrupt cessation of opioids or heroin without a taper. Symptoms may include: hypertension, tachycardia, anxiety, agitation, delirium, restlessness, headache, muscle pain, tremor, fever, diarrhea, nausea, vomiting, rhinorrhea, lacrimation, pupil dilation. Unsupervised withdrawal increases risk of ongoing opioid abuse/misuse, incarceration, infectious disease transmission, and/or death	• Prevent with prescribed opioid taper, clonidine 0.05-0.2mg TID-QID x3-7 days (tapered) +/- gabapentin. Monitor BP w/ clonidine. • Symptom management with PRN use of dicyclomine, loperamide, lorazepam, quetiapine, prochlorperazine, ondansetron, cyclobenzaprine, diphenhydramine, acetaminophen or NSAIDs • Pregnant females must seek medical oversight • Consider referral for Medication Assisted Treatment (MAT; buprenorphine, methadone, naltrexone) to prevent relapse

Table 9. Opioid-induced neurotoxicity[68-73]

Risk factors for these adverse effects include high opioid doses, long-term opioid use, dehydration, renal failure, advanced age, reduced cognition, and use of other psychoactive drugs

Adverse Effects	Treatment Strategies
Sedation - incidence 20-60%; transient	• Reduce opioid dose, opioid rotation, or use of psychostimulants such as methylphenidate
Changes in cognition/memory or confusion - incidence varies with co-morbidities such as pre-existing cognitive dysfunction, metabolic abnormalities, or advanced cancer	
Delirium - incidence varies; likely under-reported; oftentimes multifactorial	• Management options include reduced opioid dose, opioid rotation, and co-prescribing a neuroleptic such as haloperidol or quetiapine while patient is clearing drug
Myoclonus - A sudden involuntary contracture of muscle fibers; involuntary jerking of limbs. Occurs most commonly in patients receiving opioids with renally-eliminated metabolites that accumulate with repeated use	• Usual treatment is opioid rotation; may be initially managed with muscle relaxants such as baclofen or benzodiazepines
Hyperalgesia - Incidence varies; likely underreported – Syndrome of increased pain sensitization that occurs most often with higher doses of opioids. May present as skin sensitivity. Be suspicious of this syndrome if patients obtain no relief with rapidly escalating opioid doses	• Management options include opioid rotation (often to methadone), NMDA-receptor antagonists such as ketamine, and non-opioid medications

Opioid Misuse/Abuse Prevention

Risk factors that can predict future risk for opioid misuse/abuse: Age < 46, heavy tobacco use, personal or family history of substance misuse (including alcohol), history of preadolescent sexual abuse (if female), psychological comorbidities

	Prior to Opioid Initiation	Acute & Subacute <12 weeks	Chronic ≥ 12 weeks
WI PDMP	Required by state law to review with every issued prescription		
Screening Tools	ORT – Opioid Risk Tool[74]	• Current Opioid Misuse Measure (COMM)[77] • Diagnosis, Intractability, Risk and Efficacy Score (DIRE)[78-79] • The Revised Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R)[80]	
Opioid Agreement	Not required unless initiating what will be chronic opioid use	Not required	Recommended with 1 provider and 1 dispensing pharmacy for a specific treated condition. Agreement includes tapering off opioids if desired functional outcome is not achieved or severe adverse effects occur. Included is an action plan for pain flares or exacerbations.
Urinary Drug Screening	Not routinely required	Not routinely required	Recommended intermittent (unscheduled) use
Referral to Pain Specialist	Recommend if pain is severe and not responding to a multimodal treatment regimen at typical doses		
Referral to Addiction Medicine	Recommended if history of substance use or addiction and ongoing pain		

Recognize signs of opioid misuse/abuse: Abrupt and/or unsupervised withdrawal increases risk of ongoing opioid abuse/misuse, transition to illicit or injection opioids, incarceration, infectious disease transmission, and/or death

Assessment Criteria	• Requesting early refills • Recurring lost or stolen prescriptions • Multiple unsanctioned dose increases • Multiple prescribers and/or pharmacies • Frequent emergency department visits	• Snorting or injecting opioids • Selling prescribed medications • Diversion or sharing of others' medications • Prescription forgery
Treatment Strategies	Notify prescriber. Urine Drug Screening (UDS), pain specialist or addiction medicine referral may be appropriate. If opioid cessation is decided, recommend a therapeutic taper off opioids and concomitant initiation/up-titration of multimodal therapy.	Do not fill forged, illegal, prescriptions. Notify prescriber. Severity of infraction may warrant police involvement. Patient will require referral to addiction medicine specialist for Medication Assisted Treatment (MAT) with methadone, buprenorphine/naloxone (Suboxone®), or naltrexone.
Electronic hyperlinks for references 74-78 available in supplement. Scan QR code for accessibility.		

	Pain Indication	Non-pharmacologic	Primary Pharmacologic	Secondary Pharmacologic	Comments
Primary inflammatory	**Post-procedure, surgery, Fracture repairs**[17-18] (examples: hysterectomy, appendectomy, cholecystectomy, bone fracture repairs). Soft tissue recovery 2-6 weeks; 3-7 days analgesia post-procedure often adequate. Bony recovery = 6-12 weeks; will require longer analgesic course.	• Pre-operative patient and family-centered education about post-operative expectations and plan/goals for recovery • Ice q20 min 4-8/day x48 hours then heat thereafter (104-115 degrees F). Do not apply directly to open wounds/sores on skin. • Cognitive Behavioral Therapy (CBT) • TENS (Transcutaneous electrical nerve stimulation) – electrodes applied to intact skin only	• Pre-op dose of celecoxib x1 if not contraindicated • Acetaminophen, scheduled x 3-14 days, then PRN • NSAIDs x 3-14 days scheduled unless contra-indication • Lidocaine topical patch if incisional pain • Epidural or peripheral nerve catheter inpatient when indicated	• Opioids; <3-7 days sufficient for many procedures. Oral preferred when able. • May consider short-term adjunctive gabapentin perioperatively for major procedures with nerve involvement • May consider adjunctive IV ketamine infusion for opioid tolerant patients prior to procedure • IV lidocaine infusion perioperatively if epidural contraindicated & no underlying cardiac comorbidities	
	Musculoskeletal Pain/Injury[19] Bone Fractures	• R– Rest & decreased activity • I– Ice x20 minutes x4-8 times daily with ice pack, cold pack, or bag filled with crushed ice and wrapped in towel. • C– Compression to reduce swelling • E– Elevation above heart	• Acetaminophen • Topical NSAIDs; including trolamine • Oral NSAIDs	• Muscle relaxants • Opioids, if needed, <3-7 days sufficient for many injuries	
	Osteoarthritis (OA)[20-22] of hip, knee or hands leading to possible degenerative joint disease (DJD)	• Aquatic or other exercise • Weight loss, if needed • Provide assistive devices • Splits, braces, walking aids, shoe insoles if needed • Heat/ice, per RICE algorithm • TENS (knee or hip) • Surgery	• Intermittent Acetaminophen • Topical capsaicin (hand only) • Topical NSAID; including trolamine (hand, knee) • *Glucosamine+/-condroitin**	• Intermittent oral NSAID • Continuous oral NSAID • Duloxetine (knee) • Intermittent opioids, preferably tramadol** • Intra-articular steroid or hyaluronidase injections NOT recommended for chronic management but may be considered for acute exacerbations in hip & knee	**Not a universal recommendation in all guidelines due to lack of efficacy with variety of supplements available in US. Non-FDA approved.*
Mixed inflammatory and neuropathic	**Acute/chronic Back Pain**[23-27] +/-radiculopathy or sciatica symptoms suggest nerve involvement; pain due to degenerative disc disease; spinal stenosis Acute < 4 weeks Subacute 4-12 week Chronic >12 weeks Be suspect of vertebral fractures in elderly, osteoporotic, or steroid-dependent with new onset acute, severe, localized back pain.	*Acute Abortive:* • Heat per RICE algorithm • Massage • Acupuncture • Spine manipulation • Exercise (Yoga) *Chronic Preventative:* • Biofeedback • CBT • Exercise such as Tai Chi/Swimming • Mindfulness • Multidiscipline rehabilitation • Physical therapy (PT) • Spine manipulation • Stress reduction • Weight loss if indicated	*Acute Abortive:* • Intermittent oral NSAID • Muscle relaxants *Vertebral Fractures* • Intranasal calcitonin *Chronic Preventative:* • Continuous oral NSAID • SNRI (Duloxetine)	*Acute Abortive:* • Intermittent opioids, preferably tramadol** if screened appropriate but should be reserved as last line option used in combination primary recommendations • Steroid or local anesthetic spinal or nerve root injections for acute debilitating *Chronic Preventative:* • Refer for nerve ablation procedure for chronic debilitating	**Guidelines focus on nonpharmacologic therapy for symptom control. Regardless of intervention, pain often improves with time. Pharmacologic and nonpharmacologic therapy are equally efficacious but lesser harm associated with non-pharmacologic therapy. May consider neuropathic agents for patients with radiculopathy or sciatica symptoms in addition to back pain. TCAs recently removed from guideline recommendations, including patients with radiculopathy.*
	Lumbar Disc Herniation[28] dermatomal leg pain with lower extremity numbness +/- weakness; have concern with concomitant urinary retention (spine canal compromise)	• PT for mild to moderate symptoms • Spinal manipulation • Surgery for severe symptoms	• Gabapentin • Low dose TCA	• Pregabalin if fail gabapentin • Steroid spinal injections may be considered for acute exacerbations but NOT recommended for chronic management	
Primary neuropathic	**Peripheral Diabetic Neuropathy (PDN)**[29-33] Chronic metformin can result in B12 deficiency induced peripheral neuropathy. Suspect B12 deficiency in long-term metformin use & megaloblastic anemia. Refer to MD for a lab evaluation of Hgb, B12, MCV.	• TENS – electrodes applied to intact skin only • Acupuncture • Improved blood glucose control	• Gabapentin • SNRI • Vitamin B12 if long-term metformin use • Combination therapy has improved efficacy with lower ADEs	• Pregabalin if gabapentin failure • TCA if SNRI failure or contraindication • Topical capsaicin, if tolerated & skin intact • Topical lidocaine if skin intact • Alpha-lipoic acid • Opioids, preferably tapentadol or tramadol, if screened appropriate for long term use. • Valproate or dextromethorphan/quinidine last line PO alternatives	**avoid NSAIDs/turmeric due to lack of efficacy, and frequent use of ACE-inhibitors and aspirin diabetic related indications.*
	Postherpetic neuralgia (PHN)[34-38] burning/tingling sensation in dermatome following shingles rash	Varicella and zoster vaccinations for prevention	• Gabapentin • TCA • Topical lidocaine if skin intact • Combination therapy has improved efficacy with lower ADEs	• Pregabalin if gabapentin failure • Topical capsaicin, if tolerated & skin intact	
	Neuropathic pain[39-46] secondary to other primary illness (Ex: peripheral artery disease, chemotherapy-induced, post-amputation pain, spinal cord injury, multiple sclerosis, post-stroke)	TENS – electrodes applied to intact skin only. Electrode placement must be peripheral. Do not apply to chest, neck or head.	• Gabapentin • SNRI • Topical capsaicin if pain local and intact skin • Combination therapy has improved efficacy with lower ADEs	• Pregabalin if gabapentin failure • TCA if SNRI failure or contraindication • Intermittent IV lidocaine infusions • Opioids, preferably tapentadol or tramadol**, if screened appropriate for long term use. • Continuous IV lidocaine infusions if short-term benefit from intermittent IV lidocaine infusions	
	Fibromyalgia[47-49] disorder of widespread pain with concomitant impaired sleep and memory and fatigue	• Exercise • Acupuncture • CBT • Meditation • Mindfulness	*Pain* • SNRI • Pregabalin *Sleep* • Low dose TCA • Cyclobenzaprine	*Pain* • TCA if SNRI failure • SSRI if TCA/SNRI failure • Gabapentin if pregabalin failure or financial barrier • Tramadol** if screened appropriate for long term use	

Mixed vascular & inflammatory	**Trigeminal neuralgia**[50-53] unilateral, severe facial pain from the 5th cranial nerve	• CBT • Support groups for coping strategies • Referral to neurosurgery for procedure if fail pharmacotherapy	• Carbamazepine or oxcarbazepine • IV Lidocaine 5mg/kg for acute exacerbation	• Lamotrigine • Baclofen • Gabapentin or pregabalin • Botulinum Toxin injections • IV fosphenytoin for acute exacerbation	
	Headache - abortive[54-56] Refer for warning signs: neurologic deficits, worst headache of life, thunderclap, vision changes, fever and/or shunt	• Dark, quite space • Avoid stimulation • Relaxation to alleviate stress and/or anxiety • Sleep during episode if possible	• Acetaminophen • NSAID • Triptan • IV hydration • Ondansetron • Prochlorperazine • Diphenhydramine	• Magnesium IV • Metoclopramide IV • Corticosteroids IV • Dihydroergotamine IV • Valproate IV	
	Headache - prophylaxis[57-59] Initiate if > 3-4 per month, disabling or chronic.	• Identify trigger(s) • Trigger avoidance • Avoid overuse of OTC analgesics • Good sleep hygiene • Avoid skipping meals • Increase dietary riboflavin	• Riboflavin • Magnesium • Propranolol or nadolol • TCA • Verapamil	• Melatonin • Co-Q-10 • Valproate • Topiramate • Zonisamide • Gabapentin • Venlafaxine	

- **Tramadol=very weak opioid agonist regarded in various national guidelines. ≤10% potency of other potent opioids. Use cautiously with its low efficacy, concomitant serotonergic properties at high dose & when combined with other serotonergic agents. Lowers seizure threshold & requires renal adjustment.
- Evidence-based preferred muscle relaxants: Baclofen or tizanidine, followed by cyclobenzaprine. Data limited/weak to support carisoprodol, chlorzoxazone, metaxalone, methocarbamol, orphenadrine. Risk >benefit with benzodiazepines unless in monitored setting, despite limited efficacy.
- SNRIs for pain: duloxetine, milnacipran, venlafaxine, desvenlafaxine. Venlafaxine ≤150mg lacks norepinephrine properties and is less effective.
- Duloxetine target dose 60mg/day for nerve pain conditions, ADEs >efficacy with 120mg/day. Avoid with liver disease or concomitant heavy ETOH use.
- Gabapentin target 1200-3600 mg/day for nerve pain, renally adjusted.
- Pregabalin target dose 300-600mg/day for nerve pain, renally adjusted.
- Most studied TCA=amitriptyline. Target dose for sleep ≤ 50mg/day. Higher TCA doses may be required for antidepressant effect for concomitant management of depression. If undesirable adverse effects, desipramine & nortriptyline have improved rates ADEs.

Abbreviations: ADEs, adverse drug events (side effects); CBT, cognitive behavioral therapy; ETOH, alcohol; FDA, Food and Drug Administration; IV, intravenous; NSAID, non-steroidal anti-inflammatory drug; OTC, over the counter; PO, oral; PRN, as needed; RICE, rest, ice, compression, and elevation; SNRI, serotonin-norepinephrine reuptake inhibitor; SSRI, selective serotonin reuptake inhibitor; TB, tuberculosis; TCA, tricyclic antidepressant; TENS, transcutaneous electrical nerve stimulation;

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80. The Revised Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R)

Pain Management by Diagnosis

	Pain Indication	Non-pharmacologic	Primary Pharmacologic	Secondary Pharmacologic	Comments
Primary inflammatory	**Post-procedure, surgery, Fracture repairs**[17-18] (examples: hysterectomy, appendectomy, cholecystectomy, bone fracture repairs). Soft tissue recovery 2-6 weeks; 3-7 days analgesia post-procedure often adequate. Bony recovery = 6-12 weeks; will require longer analgesic course.	• Pre-operative patient and family-centered education about post-operative expectations and plan/goals for recovery • Ice q20 min 4-8/day x48 hours then heat thereafter (104-115 degrees F). Do not apply directly to open wounds/sores on skin. • Cognitive Behavioral Therapy (CBT) • TENS (Transcutaneous electrical nerve stimulation) – electrodes applied to intact skin only	• Pre-op dose of celecoxib x1 if not contraindicated • Acetaminophen, scheduled x 3-14 days, then PRN • NSAIDs x 3-14 days scheduled unless contra-indication • Lidocaine topical patch if incisional pain • Epidural or peripheral nerve catheter inpatient when indicated	• Opioids; <3-7 days sufficient for many procedures. Oral preferred when able. • May consider short-term adjunctive gabapentin perioperatively for major procedures with nerve involvement • May consider adjunctive IV ketamine infusion for opioid tolerant patients prior to procedure • IV lidocaine infusion perioperatively if epidural contraindicated & no underlying cardiac comorbidities	
	Musculoskeletal Pain/Injury[19] Bone Fractures	• R – Rest & decreased activity • I – Ice x20 minutes x4-8 times daily with ice pack, cold pack, or bag filled with crushed ice and wrapped in towel. • C – Compression to reduce swelling • E – Elevation above heart	• Acetaminophen • Topical NSAIDs; including trolamine • Oral NSAIDs	• Muscle relaxants • Opioids, if needed, <3-7 days sufficient for many injuries	
	Osteoarthritis (OA)[20-22] of hip, knee or hands leading to possible degenerative joint disease (DJD)	• Aquatic or other exercise • Weight loss, if needed • Provide assistive devices • Splints, braces, walking aids, shoe insoles if needed • Heat/ice, per RICE algorithm • TENS (knee or hip) • Surgery	• Intermittent Acetaminophen • Topical capsaicin (hand only) • Topical NSAID; including trolamine (hand, knee) • *Glucosamine+/-condroitin**	• Intermittent oral NSAID • Continuous oral NSAID • Duloxetine (knee) • Intermittent opioids, preferably tramadol** • Intra-articular steroid or hyaluronidase injections NOT recommended for chronic management but may be considered for acute exacerbations in hip & knee	**Not a universal recommendation in all guidelines due to lack of efficacy with variety of supplements available in US. Non-FDA approved.*
Mixed inflammatory and neuropathic	**Acute/chronic Back Pain**[23-27] +/-radiculopathy or sciatica symptoms suggest nerve involvement; pain due to degenerative disc disease; spinal stenosis Acute < 4 weeks Subacute 4-12 week Chronic >12 weeks Be suspect of vertebral fractures in elderly, osteoporotic, or steroid-dependent with new onset acute, severe, localized back pain.	*Acute Abortive:* • Heat per RICE algorithm • Massage • Acupuncture • Spine manipulation • Exercise (Yoga) *Chronic Preventative:* • Biofeedback • CBT • Exercise such as Tai Chi/Swimming • Mindfulness • Multidiscipline rehabilitation • Physical therapy (PT) • Spine manipulation • Stress reduction • Weight loss if indicated	*Acute Abortive:* • Intermittent oral NSAID • Muscle relaxants *Vertebral Fractures* • Intranasal calcitonin *Chronic Preventative:* • Continuous oral NSAID • SNRI (Duloxetine)	*Acute Abortive:* • Intermittent opioids, preferably tramadol** if screened appropriate but should be reserved as last line option used in combination primary recommendations • Steroid or local anesthetic spinal or nerve root injections for acute debilitating *Chronic Preventative:* • Refer for nerve ablation procedure for chronic debilitating	**Guidelines focus on nonpharmacologic therapy for symptom control. Regardless of intervention, pain often improves with time. Pharmacologic and nonpharmacologic therapy are equally efficacious but lesser harm associated with non-pharmacologic therapy. May consider neuropathic agents for patients with radiculopathy or sciatica symptoms in addition to back pain. TCAs recently removed from guideline recommendations, including patients with radiculopathy.*
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Screening Tools	ORT – Opioid Risk Tool[74]	• Current Opioid Misuse Measure (COMM)[77] • Diagnosis, Intractability, Risk and Efficacy Score (DIRE)[78-79] • The Revised Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R)[80]	
Opioid Agreement	Not required unless initiating what will be chronic opioid use	Not required	Recommended with 1 provider and 1 dispensing pharmacy for a specific treated condition. Agreement includes tapering off opioids if desired functional outcome is not achieved or severe adverse effects occur. Included is an action plan for pain flares or exacerbations.
Urinary Drug Screening	Not routinely required	Not routinely required	Recommended intermittent (unscheduled) use
Referral to Pain Specialist	Recommend if pain is severe and not responding to a multimodal treatment regimen at typical doses		
Referral to Addiction Medicine	Recommended if history of substance use or addiction and ongoing pain		

Recognize signs of opioid misuse/abuse: Abrupt and/or unsupervised withdrawal increases risk of ongoing opioid abuse/misuse, transition to illicit or injection opioids, incarceration, infectious disease transmission, and/or death

Assessment Criteria	• Requesting early refills • Recurring lost or stolen prescriptions • Multiple unsanctioned dose increases • Multiple prescribers and/or pharmacies • Frequent emergency department visits	• Snorting or injecting opioids • Selling prescribed medications • Diversion or sharing of others' medications • Prescription forgery
Treatment Strategies	Notify prescriber. Urine Drug Screening (UDS), pain specialist or addiction medicine referral may be appropriate. If opioid cessation is decided, recommend a therapeutic taper off opioids and concomitant initiation/up-titration of multimodal therapy.	Do not fill forged, illegal, prescriptions. Notify prescriber. Severity of infraction may warrant police involvement. Patient will require referral to addiction medicine specialist for Medication Assisted Treatment (MAT) with methadone, buprenorphine/naloxone (Suboxone®), or naltrexone.

Electronic hyperlinks for references 74-78 available in supplement. Scan QR code for accessibility.

Additional Resources

For more information, reference list, and resources please see the following pages.

	Reference	Reference/Abstract Hyperlink
	Pain Assessment and Analgesia	
1	Merskey H, Bogduk N. *Classification of Chronic Pain: Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms*. 2nd ed. Seattle, WA: IASP Press;1994	https://www.iasp-pain.org/PublicationsNews/Content.aspx?ItemNumber=1673
2	*Pain* 1990 May;41(2):139-150	https://www.ncbi.nlm.nih.gov/pubmed/2367140
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4	*Clin J Pain* 2007 Jan;23(1 Suppl):S1-S43	https://www.ncbi.nlm.nih.gov/pubmed/17179836
5	*J Pain* 2016 Feb;14(2):131-157	https://www.ncbi.nlm.nih.gov/pubmed/26827847
	Acetaminophen	
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7	*Cochrane Database Syst Review* 2016 Jun 7;(6):CD012230	https://www.ncbi.nlm.nih.gov/pubmed/27271789
8	*J Gastrointest Surg* 2019 Apr 22. doi: 10.1007/s11605-019-04220-1 [Epub ahead of print]	https://www.ncbi.nlm.nih.gov/pubmed/31012040
	Nonsteroidal Anti-inflammatory Drugs (NSAIDs)	
9	*Ann Intern Med* 1997 Feb 1; 126(3):193-199	https://www.ncbi.nlm.nih.gov/pubmed/9027269
10	*Nephrol Dial Transplant* 2019; 34: 1145–1154	https://www.ncbi.nlm.nih.gov/pubmed/31264694
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13	*J Am Coll Cardiol* 2008 Nov 11; 52(20): 1628-1636	https://www.ncbi.nlm.nih.gov/pubmed/18992652
14	*N Engl J Med* 2001; 345:1809-1817	https://www.ncbi.nlm.nih.gov/pubmed/11752357
15	*Am J Gastroenterol* 2009; 104: 728-738	https://www.ncbi.nlm.nih.gov/pubmed/19240698
16	*Drug Saf* 2010 Jun 1;33(6): 443-453	https://link.springer.com/article/10.2165%2F11534590-000000000-00000

	Post-procedure, Surgery, Fracture Repairs	
17	*J Am Coll Surg* 2019 Sep;229(3): 316-322	https://www.ncbi.nlm.nih.gov/pubmed/31154092
18	*J Pain* 2016 Feb;14(2):131-157	https://www.ncbi.nlm.nih.gov/pubmed/26827847

	Musculoskeletal Pain/Injuries	
19	National Institute of Health (NIH): Sports Injuries	https://www.niams.nih.gov search: sports injuries

	Osteoarthritis (OA)	
20	*Arthritis Care Res* 2012 Apr;64(4): 465-474 (US)	https://www.ncbi.nlm.nih.gov/pubmed/22563589
21	Osteoarthritis (OA) Tool. The College of Family Physicians Canada Sept 2014	https://www.cfpc.ca/oatool/
22	*Semin Arthritis Rheum* 2016 Feb;45(4 Suppl): S3-11	https://www.ncbi.nlm.nih.gov/pubmed/26806188

	Acute or Chronic Back Pain	
23	*Disabil Rehabil* 2019 Aug 1*:* 1-15	https://www.ncbi.nlm.nih.gov/pubmed/31368371
24	*Asian J Anesthesiol* 2019 Aug: 1-20	https://www.ncbi.nlm.nih.gov/pubmed/31382324
25	*Ann Intern Med* 2017 Apr 4;166(7): 514-530	https://www.ncbi.nlm.nih.gov/pubmed/28192789
26	*Spine J* 2013 Jul;13(7): 734-743	https://www.ncbi.nlm.nih.gov/pubmed/23830297
27	*APS* 2009. Chou, Huffman. Guideline for the evaluation and management of low back pain – Evidence Review	https://www.mccofaz.com/media/3741/evaluation-and-management-of-low-back-pain.pdf

	Lumbar Disc Herniation	
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	Peripheral Diabetic Neuropathy (PDN)	
29	*Pain Ther* 2017 Dec;6 (Suppl 1): 35-42	https://www.ncbi.nlm.nih.gov/pubmed/29178033
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32	*Neurology* 2011 May 17;76(20): 1758-1765	https://www.ncbi.nlm.nih.gov/pubmed/21482920
33	*South Med J* 2010 Mar; 103(3): 265-267	https://www.ncbi.nlm.nih.gov/pubmed/20134380

	Postherpetic Neuralgia (PHN)	
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38	CDC: Shingles (Herpes Zoster)	https://www.cdc.gov/shingles

	Neuropathic Pain (secondary to other primary illness)	
39	National Institute for Health and Care Excellence. Neuropathic Pain 2013. Updated 2019	https://www.nice.org.uk/guidance/CG173
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44	*Mayo Clin Proc* 2010; 85(3):S3-14	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2844007/
45	*Eur J Neuro* 2010; 17: 1113-e88	https://www.ncbi.nlm.nih.gov/pubmed/20402746
46	*Am J Med* 2009;122: S22-32	https://www.ncbi.nlm.nih.gov/pubmed/19801049

	Fibromyalgia	
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48	*Biomedicines* 2017 Jun;5(2):20	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5489806/
49	*J of Pain* 2017 Jul;18(7):747-756	https://www.ncbi.nlm.nih.gov/pubmed/28034828

	Trigeminal Neuralgia	
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51	*J Anethes* 2018 Jun;32(3):463-478	https://www.ncbi.nlm.nih.gov/pubmed/29737410
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59	*Headache* 2011;51(3):469-483	https://www.ncbi.nlm.nih.gov/pubmed/21352222

	Strong & Mixed Mechanism Opioids Tables & Equianalgesic Dosing & Titration	
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	Milligrams of Morphine Equivalent (MME) Conversion Table	
61	Centers for Medicare & Medicaid Services (CMS) MME Conversion Factors	CMS Opioid Oral MME Conversion Factors
62	Oregon Pain Guidance Opioid Conversion (MME) Online Calculator	Oregon Pain Guidance Opioid Conversion Calculator

	Fentanyl Transdermal Patch Conversions	
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69	*J Addict Med* 2016 May-Jun;10(3):140-142	https://www.ncbi.nlm.nih.gov/pubmed/27223833
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73	*AM Fam Physician* 2006; 74 1347-54	https://www.ncbi.nlm.nih.gov/pubmed/17087429

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75	*Pain Med* 2012; 13:886-896	https://www.ncbi.nlm.nih.gov/pubmed/22694154
76	CDC Guideline for Prescribing Opioids for Chronic Pain 2016	www.cdc.gov/drugoverdose/prescribing/guideline.html
77	Current Opioid Misuse Measure (COMM)	http://mytopcare.org/wp-content/uploads/2013/05/COMM.pdf
78	Diagnosis, Intractability, Risk and Efficacy (DIRE) Score Calculator	https://www.mdcalc.com/dire-score-opioid-treatment
79	DIRE Score: Patient Selection for Chronic Opioid Analgesia	DIRE Score: Patient Selection for Chronic Opioid Analgesia
80	The Revised Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R)	The Revised Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R)