

## Indiana University Trauma and Acute Care Surgery Multimodal Pain Protocol

Pain regimen at admission for ALL patients (except those on buprenorphine) should include, unless specific contraindication exists:

- Acetaminophen 1000 mg PO every 6 hours (or equivalent)
  - Rectal formulation should be used in patients in bowel discontinuity or who are not tolerating PO intake unless recent rectal surgery.
- Ketorolac 15 mg IV Q 6 hrs x 3 doses followed by naproxen 500mg PO every 12 hours. Unless contraindication to NSAIDS\*
- Gabapentin 300 mg PO every 8 hours. Titrate gabapentin higher as indicated for uncontrolled pain. Max dose 1200 mg every 8 hours. Gabapentin in setting of renal failure: CrCl 30-60 mL/min start 200 mg once daily, max dose 700 mg once daily. CrCl15 <mL/min 100-300mg/day.
- Lidocaine Patch
- Tramadol 100 mg PO PRN every 6 hours (50 mg PO every 6 hours for CrCl <30 mL/min or in elderly). Contraindications include seizure disorder and SSRI/MAOI/tricyclic use. Caution use in patients with lowered seizure threshold such as new/active intracranial hemorrhage. Use oxycodone immediate release 5mg PO every 4 hours PRN if contraindications are present.

\*Contraindications to NSAIDS:

- History of peptic ulcer disease, NSAID related gastritis/GI bleed
- Renal Failure or acute kidney injury
- Pregnancy
- *Relative Contraindication- patients greater than age 18 with orthopedic fractures. Discuss with attending/ortho in cases which exceptions may be considered (i.e. poorly controlled musculoskeletal pain)*

**Escalation of Pain medications:**

**For persistent MODERATE pain**

- Tramadol 100 mg PO every 6 hours *scheduled* (discuss with attending if CrCl <30 mL/min).
- Oxycodone immediate release 5mg PO every 4 hours PRN pain score 4-6.
- Methocarbamol 1500mg PO every 6 hours if pt describes spasmodic muscular pain.

**For SEVERE pain**

- Discontinue Tramadol.
- Oxycodone 5mg PO every 4 hours *scheduled* plus additional
- Oxycodone 5mg PO every 4 hours PRN pain score 7-10
- Can continue up titration of oxycodone by 5mg increments up to 10mg scheduled and 10mg PRN

**For persistent SEVERE pain**

- Methadone:
  - QTc must be less than 500.
  - Dosing begins at 5mg PO q8 hours and can be increased to 10mg PO q8hours for patients who are not on methadone as an outpatient. This can be rapidly tapered or stopped abruptly as its long

half-life provides for auto-tapering of the drug. Should only be used for 48-72 hours and must be stopped while inpatient.

- Use for pain control and in opioid naïve patients has been described in the setting of acute perioperative pain management. It is a safe drug for use in patients requiring high doses of traditional oral opioids but should be started at the low dose.
- Opioid non-naïve patients dosing should be considered early if pain control is not achieved with the above oral regimen or if the patient is requiring IV opioids.
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- Intravenous Opioids: These are truly last line medications. Use for hyperacute pain
  - hydromorphone 0.2-0.4 mg IV ONCE then discontinue
  - Morphine 1-4 mg IV ONCE then discontinue
  - Fentanyl 25-100mcg: Perioperative, intubated patients, or hyperacute pain (i.e. in trauma bay)

#### For Patients with home prescription opioid use

- Start home medication at usual dose in addition to the above protocol. If unable to take PO, convert to equivalent daily dose morphine or dilaudid.
  - These patients may require up titration of this regimen given their opioid tolerance.
  - Discuss regimen with attending staff and/or pharmacist.
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**Non-Opioid Adjuncts:** should be considered if pain control is not achieved with the above regimen or if IV opioids are being considered.

- Lidocaine IV -120mg Bolus followed by 2mg/min – no titration.
  - Child C cirrhosis is not a contraindication; use with caution.
  - Contraindication: heart failure with EF < 20%, known 2<sup>nd</sup> or 3<sup>rd</sup> degree heart block if no pacemaker. Reentrant tachycardia.
  - Patients on lidocaine drips currently require ICU (not available for floor or PCU patients).
  - Lidocaine levels must be checked q6 hours.
  - Use with caution in obese patients.
- Ketamine IV infusion 0.2- 0.5 mg/kg/hr continuous infusion without RN titration
  - Patients on ketamine drips require additional monitoring and should be in PCU or ICU.
  - Patients should also be monitored for side effects such as hallucination, dysphoria, muscle twitching, hypertension, increased ICP.
- Trauma Team regional pain: Consider routine TAP blocks, rib blocks, On Q pain pumps. Discuss with attending as a possible treatment option.

#### *Future Possibilities-*

- Regional pain management protocol and discussion are underway, involvement of the Anesthesia Acute Pain Service. Consider consultation to the acute pain service early for blocks.
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#### De-escalation and Discharge Medications

- As patients progress during hospital stay, de-escalation of pain medications should occur with the goal regimen being: naproxen, gabapentin, NSAID, and prn tramadol.

- Daily number of PRN opioids should be counted
  - If PRN medications are being used regularly and pain is controlled, continue regimen
  - If PRN medications are not being used, they should be discontinued and the next most potent drug should be made PRN. Example:
    - Day one: patient is started on Scheduled Tylenol, naproxen, gabapentin, and 100mg Tramadol with PRN oxycodone.
    - Day two: Patient took scheduled meds and PRN oxycodone 3 times during PT. Pain was controlled. Continue regimen.
    - Day 3: Patient took scheduled medications and 0-1 PRN oxycodone, Pain was adequately controlled. D/C oxycodone, make tramadol PRN.
    - Day 4: Patient took scheduled meds and PRN tramadol several times. Continue regimen.
    - Day 5: Patient took scheduled meds and PRN tramadol only once. Continue regimen.
    - Day 6: patient took scheduled meds and no PRN tramadol. Discontinue tramadol.
    - Day 7: Patient took scheduled meds only and feels fine. Consider making non-opioids PRN.
    - Day 8: Patient has ex-fix removal and IMN femur- restart from top.
  - Discharge:
    - Lidocaine 4% patches or OTC. Insurance rarely covers but if Rx is written, sales tax is waived.
    - Acetaminophen 1 gm PO Q6H (2-week supply) with one refill
    - Gabapentin 300 mg PO every 8 hours (2-week supply) with one refill
    - Naproxen 500mg IR PO every 12 hours (1 month supply) with one refill.
    - For patients still requiring opioid at time of discharge favor either tramadol or oxycodone at equianalgesic dose when possible. Provide 1 week supply. Insurance barriers may require a different opioid which should be honored to reduce financial burden on the patient. Consider writing “MUST LAST 7 DAYS” and “Only valid if filled within 7 days of Rx date” on opioid prescriptions.
  - If a patient is on a pain regimen that required significant titration and deviation from normal de-escalation practice, please discuss outpatient pain regimen with attending physician
  - Chronic pain is defined as pain existing 3-6 months after the inciting injury. Patients requiring opioid pain medication beyond this time frame should be referred to a chronic pain specialist. Consider referral sooner if patient was on opioids at the time of admission.
  - Patients who are on suboxone, methadone, or have a pain contract, please refer the patient back to their prescriber and counsel regarding risk of violating pain contract. These patients will require discharge planning 2-3 days in advance.
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### General Rules of Thumb

- Only one team should be prescribing opioids to inpatients. This ideally also applies to the outpatient setting.
- There should be only one PRN opioid prescribed in the chart in addition to the scheduled multimodal regimen that may or may not include a scheduled opioid.
- If patient is requiring multiple PRN PO medications- schedule that medication and add an additional PO PRN
- If an opioid is scheduled there should be hold parameters in the order.
- For intractable pain – IV opioid medications may be used but should be used as rescue dose, intended for one time use. Thus, ordering scheduled or multi-dose PRN should be a rare exception to the general protocol.
- Never use fentanyl as a PRN or maintenance for prolonged periods of time. Fentanyl drips in intubated patients should be discontinued as soon as possible and within 24 hours except in rare circumstances.

- If a patient is over sedated or has not required any PRNs, discontinue scheduled opioid (or decrease the dose by increments of 5) and make it PRN.
- All opioids should be used cautiously and all efforts made to minimize use in every patient. Elderly patients are particularly susceptible to delirium and over sedation and opioids should be used sparingly in this population.

## References

1. Acute Trauma Pain Multimodal Therapy. University of Texas at Houston.  
<https://med.uth.edu/surgery/acute-trauma-pain-multimodal-therapy/> Last updated 9/2017
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3. Principles of Analgesic Use in the Treatment of Acute Pain and Cancer Pain, 6th ed, Glenview, IL: American Pain Society, 2008.
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5. Practice Guidelines for Acute Pain Management in the Perioperative Setting: An Updated Report by the American Society of Anesthesiologists Task Force on Acute Pain Management; Anesthesiology, February 2012 – Volume 116 – Issue 2 – p 248–273
6. F Machado, C Palmiera, J Torres, J Vieira, H Ashmawi. Intraoperative Use of Methadone Improves Control of Post-Operative Pain in Morbidly Obese Patients: a Randomized controlled Study. J Pain Res. 2018. 11: 2123-2129.

## Regional Pain Management Approaches

Injury Pattern	Potential Block
Mandible fracture	<u>Inferior alveolar</u> (needs to be performed immediately preoperatively—not an option in non-operative fractures or if already in MMF)
Clavicle fracture	<u>Superficial cervical plexus</u>
Distal clavicle, scapula, proximal humerus	<u>Interscalene</u> (causes unilateral diaphragm paresis. <u>Axillary nerve</u> and <u>suprascapular nerve</u> blocks an alternative in patients with respiratory insufficiency). Also causes Horner syndrome.
Injury lower than mid-humerus	<u>Supraclavicular</u> (50% diaphragm paralysis rate) <u>Infraclavicular</u> (25% diaphragm paralysis rate) <u>Axillary nerve</u>

Rib fractures	<a href="#"><u>Serratus</u></a> (lateral rib fractures) <a href="#"><u>Paravertebral blocks</u></a> Consider thoracic epidural
Sternal fractures	Transverse thoracic
Status postoperative laparotomy	<a href="#"><u>Rectus sheath</u></a> <a href="#"><u>Quadratus lumborum</u></a>
Lower extremity long bone fractures	<a href="#"><u>Femoral</u></a> <a href="#"><u>Fascia iliaca</u></a> <a href="#"><u>Lateral femoral cutaneous</u></a> <a href="#"><u>Sciatic</u></a> (subgluteal, popliteal) <a href="#"><u>Adductor canal</u></a> <a href="#"><u>Ankle blocks</u></a>