Division of Acute Care Surgery Clinical Practice Policies, Guidelines, and Algorithms:
Acute Trauma Pain Multimodal Therapy
Clinical Practice Policy

<table>
<thead>
<tr>
<th>Original Date: 05/2013</th>
<th>Purpose: To employ an evidence-based approach to multimodal pain management that improves overall outcomes, patient satisfaction, pain management, and patient functional status while minimizing opioid-related adverse events and decreasing length of stay.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supercedes: 09/2017</td>
<td></td>
</tr>
<tr>
<td>Last Review Date: 01/2020</td>
<td></td>
</tr>
</tbody>
</table>

When ordering multimodal pain therapy, please use the Trauma Acute Pain Management Multiphase MPP (in Orders>Surgery>Trauma Surgery). Consider patient’s age, allergies, weight, renal/hepatic function, surgical procedures, injuries and prior opioid use when choosing an opioid dose. Dosage adjustments should be determined by patient’s response. Multimodal therapy should be initiated in the ED and continued through hospital course and after discharge.

**Multimodal Regimen to be Ordered Upon Admission for Background Pain:**
- Acetaminophen 1000 PO every 6 hours.
  - IV formulation should be used in patients in bowel discontinuity or who are not tolerating PO intake
- Naproxen 500 mg PO every 12 hours (contraindicated in patients with eGFR <30 mL/min)
- Gabapentin 300 mg PO every 8 hours (200 mg once daily for eGFR <30 mL/min)
- Lidoderm 5% topical Patch, Apply for 12 hours on, then 12 hours off daily

**As Needed Opioids to be Ordered Upon Admission for Breakthrough Pain:**
- For **Moderate** pain (pain score 4-6):
  - Tramadol 50 mg tab PO q 6 hours PRN pain score 4-6, or
  - Oxycodone (immediate-release) 5 mg tab PO q 4 hours PRN pain score 4-6
- For **Severe** pain (pain score 7-10):
  - Tramadol 100 mg tab PO q 6 hours PRN pain score 4-6, or
  - Oxycodone (immediate-release) 10 mg PO q 4 hours PRN pain score 7-10

**For Severe pain (pain score 7-10) and NOT responding to oral therapy:**
- Re-assess patient for potential missed injury or impending complication (e.g. compartment syndrome of an extremity)
- Consider:
  - APMS consult for regional block (see below)
  - Ketamine IV drip
    - Dose: initial bolus of 0.1 to 0.5 mg/kg (by physician), followed by 0.1 to 0.25 mg/kg/hr continuous infusion.
    - Patients on lidocaine or ketamine drips must be in ICU or IMU (not available for floor patients)
  - Lidocaine IV drip
- Dose: 20 mcg/kg/min – no titration
- Child C cirrhosis is not a contraindication; use with caution.
- Contraindication: heart failure with EF < 20%.
- Patients on lidocaine or ketamine drips must be in ICU or IMU (not available for floor patients)
  - Scheduled opioids:
    - Methadone 5 mg PO q 8 hours
    - Oxycodone Extended Release 10 mg PO q 12 hours
      - Must be swallowed; cannot be crushed and maintained the sustained release properties.
  - One-time rescue medications:
    - HYDROMorphone 0.5 mg IV q 4 hours PRN severe pain
    - Fentanyl 50 mcg IV q 1 hour PRN severe pain (ICU/IMU)
Medications Information:

(Central Prostaglandin Inhibitor)
Choose ONE:

- Acetaminophen 1000 mg PO every 6 hours.
  - Do not exceed 4000 mg every 24 hours.
  - If <50 kg: 75 mg/kg/day max dose, divided in 4 doses.
  - Liver disease patients
    - MELD <15, Child class A or B – standard acetaminophen regimen
    - MELD >15, Child C – Begin normal regimen. Check serum acetaminophen level 3 hours after 3rd dose. Adjust acetaminophen dosage as indicated. Target level <30.
  - Limit IV route x 24 hours unless specific indication exists

(NSAID COX Inhibitor)

- Ketorolac 30 mg IV once, either in trauma bay or upon admission if not previously administered.
  - Hold in all patients if eGFR <30 mL/min.
  - May administer IM if IV route unavailable.
- Naproxen 500 mg PO every 12 hours (hold in all patients if eGFR < 30 mL/min) to follow celecoxib.

(Gabapentinoid)

- Gabapentin 300 mg PO every 8 hours thereafter
  - Consider continuing pregabalin for certain indications:
    - Neuropathic pain responsive to pregabalin
    - Strongly consider in spinal cord injury patients.
  - Titrate gabapentin higher as indicated for uncontrolled pain. Max dose 1200 mg every 8 hours.
  - Gabapentin in setting of renal failure:
    - eGFR <30 mL/min start 200 mg once daily, max dose 700 mg once daily

(Local anesthetics)

- Lidoderm 5% topical Patch, Apply for 12 hours on, then 12 hours off daily
  - Apply up to 3 patches in 24 hours
  - Please specify location for each patch in order

(Weak opioid agonist/antagonist, SSRI)

- Tramadol 50 or 100 mg PO every 6 hours (for eGFR <30 mL/min, 50 mg PO every 6 hours)
- Contraindications
  - History of seizures
  - Monoamine oxidase inhibitor (MAOI) use
  - Selective serotonin reuptake inhibitor (SSRI) use (relative contraindication)
**Bowel Regimen**
- Docusate 100 mg PO every 12 hours
- Senna 17.2 mg PO every 12 hours
- Polyethylene glycol 3350 17 g PO every 12 hours
- Bisacodyl suppository 10 mg rectally daily PRN for no bowel movement

**De-escalation and Discharge Medications:**
- As patients progress during hospital stay, de-escalation of pain medications should occur with the goal regimen being: acetaminophen, gabapentin, naproxen, and prn tramadol.
- At discharge, please provide prescriptions (including acetaminophen and naproxen) for the following:
  - Acetaminophen 1 gm PO Q6H (four week supply)
    - Maximum total acetaminophen dose should not exceed 4 grams in 24 hours
    - See weight restrictions above for patients <50kg
    - Do not provide outpatient acetaminophen to any patient with cirrhosis (any Child’s Class)
  - Gabapentin 300 mg PO every 8 hours (four week supply)
  - Naproxen 500 mg PO every 12 hours (four week supply)
  - Tramadol 100 mg PO every 8 hours PRN pain (three week supply)
  - For patients still requiring intermittent prn opioids at end of hospital stay:
    - Hydrocodone-ibuprofen 7.5 mg-200 mg oral tablet 1 tab PO Q6H PRN pain
    - Take average prn oral opioid doses received in the two days prior to discharge and multiply by 7 to determine the number of pills to prescribe
- 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
- For patients whose planned follow up clinic visit is not within three weeks of discharge (rare), please provide enough pain medication for patient to not run out prior to clinic follow up.
**Regional Pain Management Approaches:**

If considering regional pain consult in a patient on whom orthopedic surgery is consulting, discuss block with them prior to consultation.

<table>
<thead>
<tr>
<th>Injury Pattern</th>
<th>Potential Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandible fracture</td>
<td>Inferior alveolar (needs to be performed immediately preoperatively—not an option in non-operative fractures or if already in MMF)</td>
</tr>
<tr>
<td>Clavicle fracture</td>
<td>Superficial cervical plexus</td>
</tr>
<tr>
<td>Distal clavicle, scapula, proximal humerus</td>
<td>Interscalene (causes unilateral diaphragm paresis. Axillary nerve and suprascapular nerve blocks an alternative in patients with respiratory insufficiency). Also causes Horner syndrome.</td>
</tr>
<tr>
<td>Injury lower than mid-humerus</td>
<td>Supraclavicular (50% diaphragm paralysis rate) Infraclavicular (25% diaphragm paralysis rate) Axillary nerve</td>
</tr>
<tr>
<td>Rib fractures</td>
<td>Serratus (lateral rib fractures) Paravertebral blocks Consider thoracic epidural</td>
</tr>
<tr>
<td>Sternal fractures</td>
<td>Transverse thoracic</td>
</tr>
<tr>
<td>Status postoperative laparotomy</td>
<td>Rectus sheath Quadratus lumborum</td>
</tr>
<tr>
<td>Lower extremity long bone fractures</td>
<td>Femoral Fascia iliaca Lateral femoral cutaneous Sciatic (subgluteal, popliteal) Adductor canal Ankle blocks</td>
</tr>
</tbody>
</table>
References: