Perioperative Acute Pain Management

Initial building blocks

- Non-opioid systemic analgesics should be used whenever possible. Significant evidence exists that many patients undergoing orthopedic surgery, enhanced recovery protocol surgery, mastectomies, and outpatient surgery benefit from preoperative administration of a single dose of non-opioid analgesics such as acetaminophen 1000 mg and NSAIDS (ketorolac 30mg IV or celecoxib 400mg po, assuming normal renal function).
- Patients with chronic pain, opioid tolerance, or undergoing major orthopedic surgery also benefit from Gabapentin 300-600mg po and Ketamine IV intraoperative.
- In the absence of significant GERD or dysphagia, the ingestion of these medications will likely not increase the risk of aspiration on induction, assuming water intake is less than 30ml and occurs 15-30 min prior to induction.
- Patients with hepatic or renal insufficiency should be excluded from receiving acetaminophen and NSAIDS, respectively.
- These medications should be continued postoperatively, likely in scheduled form in conjunction with opioid analgesics as needed:

Mild Pain	Moderate Pain	Severe Pain
➢ **Acetaminophen PO/IV** ○ **Schedule1 gram q6h, <4 grams/day in healthy adult, <3 grams/day elderly** ○ **Adverse Effects** may include hepatic & renal function impairments ➢ **NSAIDs** (choose one) ○ **Ibuprofen 600-800mg PO TID** ○ **Naproxen 250-500mg PO BID** ○ **Meloxicam 7.5-15mg daily** (inexpensive outpatient prescription) ○ **Celebrex** (selective COX-2 inhibitor, less risk of gastric ulcers and bleeding, but NO reduction in risk of kidney injury **400mg po load followed by 200mg bid)** ○ **Ketorolac 30mg IV Q8h,** reduce dose to 15mg IV in renal insufficiency **(not to exceed 3 days)** ○ **Adverse Effects** may include hepatic & renal function impairments heart failure, severe hypertension, gastric ulceration, and bleeding (avoid in patients with these comorbidities) ○ For GI upset, prescribe PPI or H2 blocker	➢ **Acetaminophen, NSAIDs scheduled** ➢ **Oral Opioids** "IR = Immediate Release = Short-Acting Opioids" ○ **Tramadol PO 50-100mg Q6 hours prn,** Not to exceed 400mg/day ▪ Weak mu-opioid, weak SNRI/SSRI ▪ Contraindication use with SNRI/SSRIs due to risk of serotonin syndrome ○ **Hydrocodone PO 5-10mg Q4-6h prn** ○ **Morphine (IR) PO 5-10mg Q4-6h prn** ○ **Oxycodone (IR) PO 5-10mg Q4-6h prn**	➢ **Acetaminophen, NSAIDs** ➢ **Oral Opioids** "IR = Immediate Release = Short-Acting Opioids" ○ **Morphine IR 15-30mg po TID prn** ○ **Oxycodone IR 10-20mg PO QID prn** ○ **Hydromorphone 2-4mg PO QID** ➢ **IV Opioids** ○ Best for post-op, NPO or poor ability to absorb PO meds ○ Must be tapered & converted to po prior to patient discharge ○ **Morphine 2-4 mg IV Q3-4hours prn** ○ **Hydromorphone 0.4-.8mg IV Q3 hours prn** ○ **Fentanyl 25-50 mcg IV Q2 hours prn** ➢ **IV PCA** ○ **Best for postop, NPO or poor ability to absorb po meds, basal dose is not recommended. The patient's family member is NOT allowed to push the PCA button!** PCA is a modality for a maintenance of analgesia so always consider loading dose prior to initiation (e.g. 2-4mg morphine or 0.4-0.5mg hydromorphone). May escalate doses every 4 hours if inadequate pain control despite full use of PCA and PRN boluses by nurse (See below on ordering PCA)

Risk Stratification

- Does the patient have a current issue with or history of the following:
    - Chronic pain / hyperalgesia / painful neuropathy at surgical site
    - Opioid use for more than 1 week preoperatively
    - Anxiety requiring medication
    - Depression requiring medication
    - High likelihood of catastrophizing
    - Severe and difficult-to-control pain after previous surgery
    - Substance abuse / dependence
- The presence of several of these risk factors increases the likelihood of difficult-to-control pain after surgery
- Would the patient benefit from a chronic pain consult prior to undergoing ambulatory surgery?

Regional Anesthetic Techniques

- Should be considered as part of the multimodal analgesic plan, specially in outpatient surgeries. This would limit inadequate pain control and adverse effects of opioids. Indwelling pain catheters should be considered for severe postoperative pain or those undergoing more invasive surgery such as:
    - Orthopedic procedures involving significant bony work (particularly arthroplasties, rotator cuff, etc)

Consider non pharmacological modalities

- Heat
- Ice
- Massage
- Repositioning

Perioperative Chronic Pain Management

(for pre-existing chronic pain or new pain with expected duration >3 months)

MAIN POINTS:

- **Multimodal analgesia should still be utilized, even in chronic pain patients**
- **Opioid stewardship is still recommended even in patients with chronic opioid use**
- **Continue whatever non-opioid analgesic medications the patient is taking for chronic pain during the perioperative period.**
- **Titration of opioids after major surgery should be based on the patient's preoperative opioid intake/tolerance. May require 10-25% increase in dose above baseline medications**
- **Patients with preoperative opioid tolerance/dependence may be at increased risk of respiratory depression postoperatively**
- **Consider obtaining recommendations from the patient's chronic pain consultant (if applicable)**

Obtain an accurate pain history

- Calculate home analgesic use (not what is prescribed, but what pt is actually taking):
    - EXAMPLE:
    - Percocet 5mg/325mg, takes 4 times per day

        - Thus 20mg oxycodone per day
    - Gabapentin 600mg, takes twice a day
        - Thus 1200mg gabapentin per day
    - Purchases Vicodin on the street, usually goes through 10 pills in a week
        - Assume 5mg hydrocodone per pill, thus 5-10mg hydrocodone per day
- Ask pt if he/she has any side effects from pain meds (tired? sleepy? "out of it"?)
- Ask a family member if present
- Any history of opioid withdrawal?

The following are recommendations that can be given to the surgical team regarding postoperative analgesia:

Neuropathic Pain Agents

- Neuropathic pain is due to peripheral nerve or CNS neuronal disease or injury
    - Described as tingling, burning, shooting, lancinating, electric shock
    - i.e., phantom limb pain, diabetic neuropathy
- Medications for Neuropathic Pain (Adverse Effects may include: sedation, edema, weight gain)
    - Gabapentin (Neurontin): initiate 300mg po qhs, gradually increase as tolerated & titrate up to 600mg po TID
    - Pregabalin (Lyrica): 50mg po qhs, gradually increase as tolerated & titrate up to 100mg po TID
    - Consider Topical Agents (such as Lidoderm patch, Capsaicin cream)
    - Serotonin-Norepinephrine Reuptake Inhibitors (SNRI's) – SEE BELOW

Serotonin-Norepinephrine Reuptake Inhibitors (SNRI's) = "Anti-Depressants"

- Effective analgesia for chronic pain due to nociceptive, neuropathic, &/or visceral causes
- May have some immediate benefit but patient must take for 6-8 weeks for maximum benefit
- Added benefits for Mood, Anxiety & Sleep Disorder symptoms for most patients
- Adverse Effects may include sedation, restless agitation, depressed mood, suicidal thoughts,
    - "Tricyclic" agents (i.e., Amitriptyline, Nortriptyline) may cause cardiac conduction delay → contraindicated with QTC>500, or conduction delay on EKG
    - "Tricyclic" agents (i.e., Amitriptyline, Nortriptyline) have Anti-Ach, Anti-H1, Anti-H2, alpha-1 blocker & alpha-2 agonist properties→ dry mouth, constipation, orthostatic hypotension
- SNRI Medications
    - Duloxetine (Cymbalta) FDA Approved – start 30mg daily, increase to 60mg daily
    - Milnacipran (Savella) FDA Approved – start 12.5mg BID for 4 days, then 25mg BID for 4 days, then 50mg BID
    - Amitriptyline (Elavil) 10mg, 25mg, 50mg, 75mg, 100mg, 150mg daily given @ hs
    - Nortriptyline (Pamelor) 10mg, 25mg, 50mg, 75mg daily given @hs
        - Much less severity of adverse effects than Amitriptyline (Elavil)

Ketamine Infusion

- Might require IMC/PACU/ICU monitoring if done outside of the OR
- Consider 10-15mg IV dose followed by an infusion 5mg/hr or 2-5mcg/kg/hr.
- Consider PRN benzodiazepine if adverse effects encountered.
- Adverse effects: hallucinations, HTN, tachycardia, depression.

Lidocaine infusion

- Requires IMC/PACU/ICU monitoring if done outside of the OR
- Consider infusion at 0.5mg/min, not to exceed 1mg/min
- Adverse effects: seizures, cardiac conduction delay, CHF, cardiac instability, tachycardia & hypertension.
- Antidote for toxicity: intralipid

Standardize opioid intake:

- Convert to morphine equivalents; can use online calculators such as Global RPH www.globalrph.com/narcotic.cgi
    - Example: ME = (30mg + 10mg) = 40mg oral morphine per day
- Be aware that cross tolerance can be present, ie dynamic process between pain tolerance and susceptibility to respiratory depression upon exposure to another medication
- Consider consulting chronic pain if patient has pre-existing fentanyl patch or methadone use