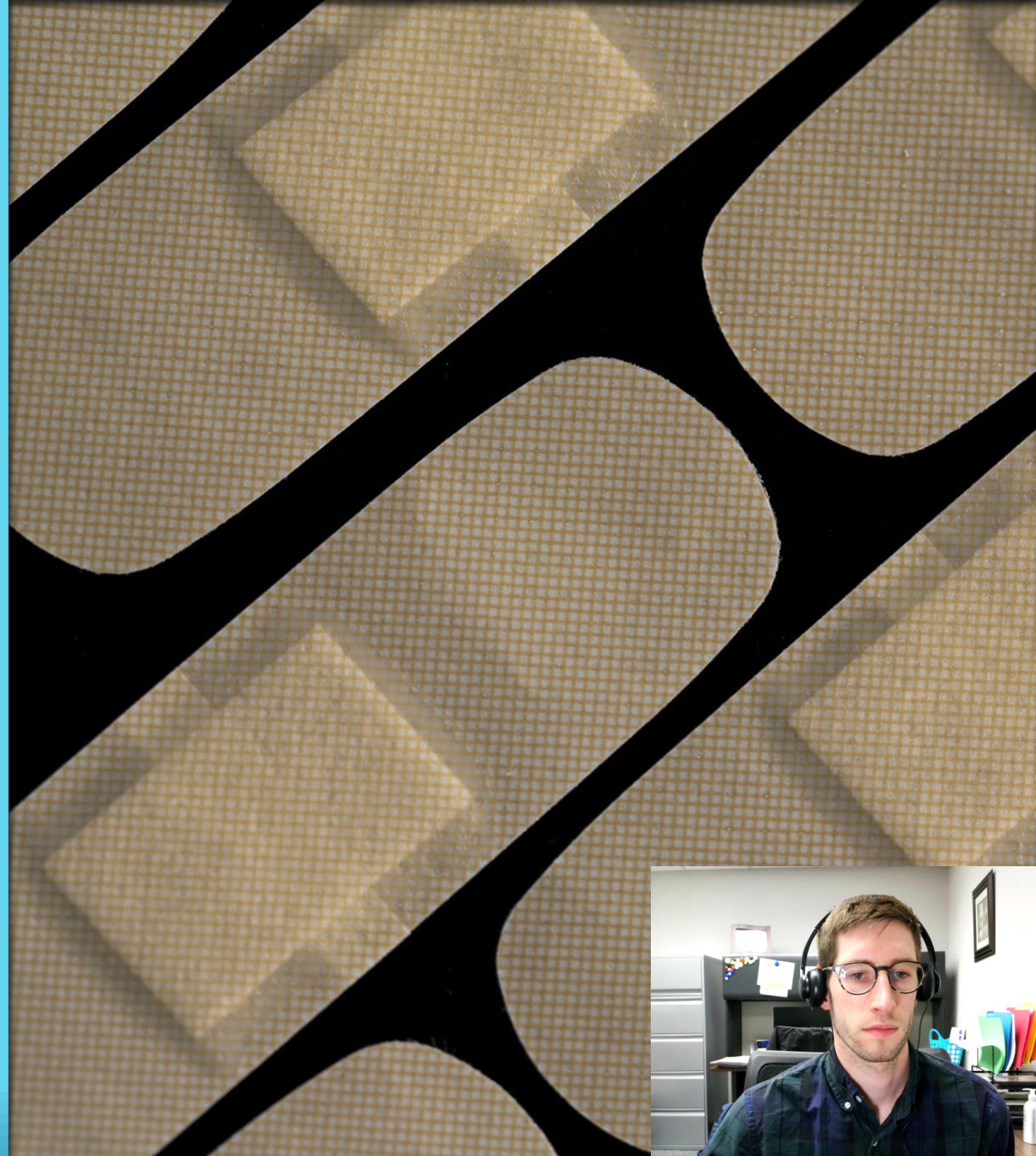
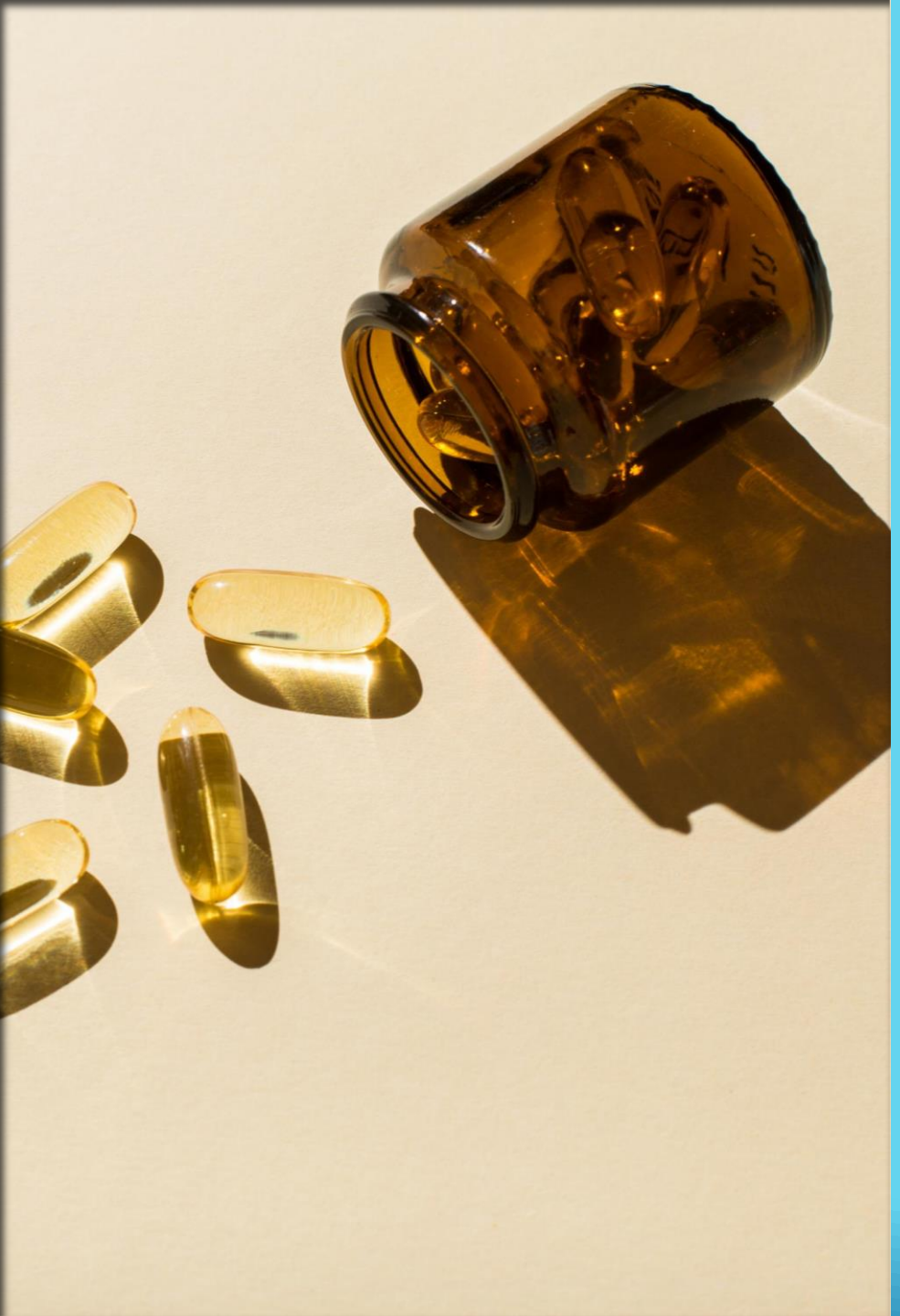
PAIN ADJUVANTS





OBJECTIVES

- Understand doses for adjuvant pain medications as well as when to use them

TYPES OF PAIN

- **Neuropathic Pain**: Burning, throbbing. Resolving the injury does not necessarily eliminate neuropathic pain
- **Nociceptive Pain**: The type of pain signaled by damage to body tissue (for example, a laceration)
- **Visceral Pain**: Pain related to internal organs inside the body

OBTAIN A GOOD PAIN HISTORY!

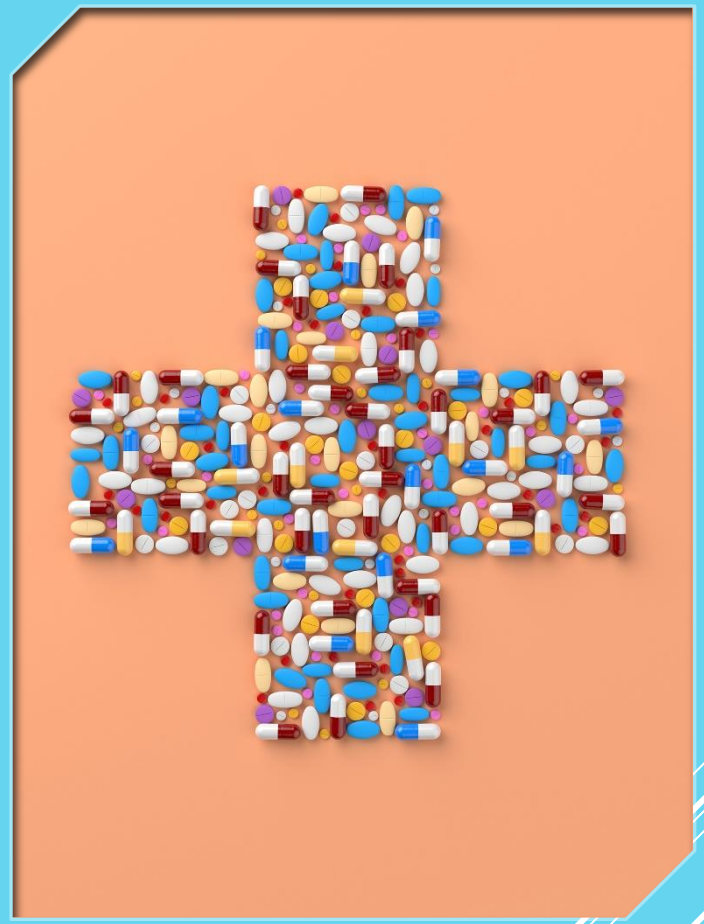
OPQRST

ACETAMINOPHEN

- 650 mg ER three-four times daily
- No more than 2000 mg daily in older adults, patients at risk for hepatotoxicity, regular alcohol use
- Simple home regimen

NSAIDS

- Modest opioid-dose sparing effect
- Bone metastases, edema, visceral inflammation
- Ibuprofen 400-800 mg PO q6-8h
- Celecoxib 200 mg BID – **least GI side effects**
- Naproxen 200-500 mg PO q12h
- Ketorolac 15-30 mg IV/IM



NSAID PRECAUTIONS

- Avoid in CrCl <60, GI bleeding, platelet dysfunction, cirrhosis, hypertension, reduced cardiac output, aspirin sensitive asthma
- Caution in those taking anticoagulants, systemic glucocorticoids, loop diuretics

STEROIDS

- Metastatic bone pain, elevated ICP, nerve impingement, spinal cord compression, malignant bowel obstruction
- Dexamethasone 4-16 mg daily PO/SQ/IV

MUSCLE RELAXANTS

- Good for **ACUTE SPASM!**
- Not good for chronic back pain
- **Not indicated** for long term use
- Side effects include dizziness, drowsiness, increased risk of injury
- **Methocarbamol** is least sedating, and cheapest
- Baclofen most effective for spasticity or involuntary jerks associated with MS or CP

MUSCLE RELAXANT DOSAGES

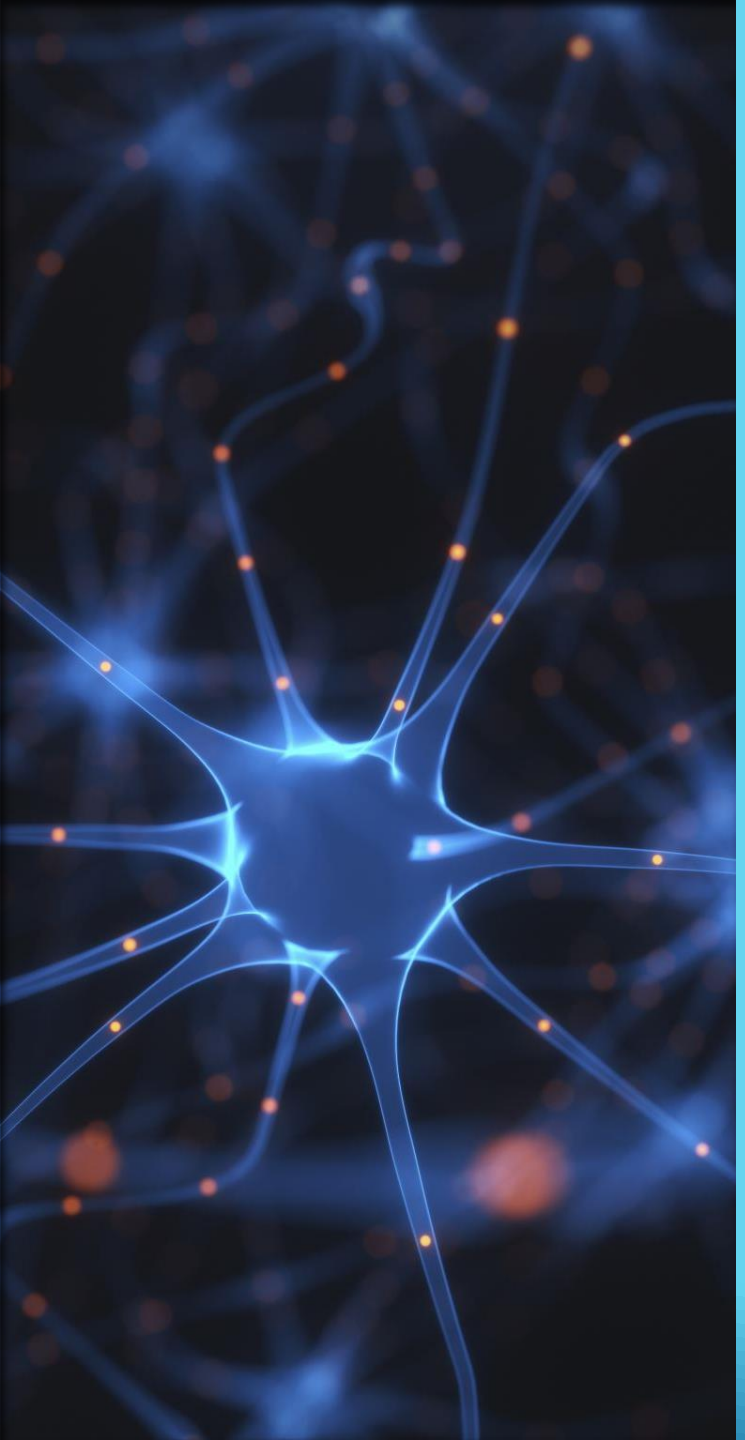
- **Methocarbamol**: 1.5g three to four times daily
- **Tizanidine**: 2-4mg every 8-12 hours
- **Cyclobenzaprine**: 5-10mg three times daily

TOPICALS

- **Lidocaine**: 4-5% patches, data suggest may be beneficial for post herpetic neuralgia pain and possibly diabetic neuropathy
- **Capsaicin**: 0.025-0.1% TID
- **1% Diclofenac Gel (Voltaren)**: good evidence for pain relief in acute MSK pain

ANTI-DEPRESSANTS

- SNRIs
  - Duloxetine 30-60 mg daily
  - Venlafaxine 37.5 mg daily, can increase as tolerated
- TCAs
  - Nortriptyline 10 mg qd
  - Amitriptyline 10 mg qhs



GABAPENTIN AND PREGABALIN

- Neuropathic pain
- Gabapentin 100-300 mg TID to start
- Pregabalin (controlled) 25 mg QD to TID to start

KETAMINE

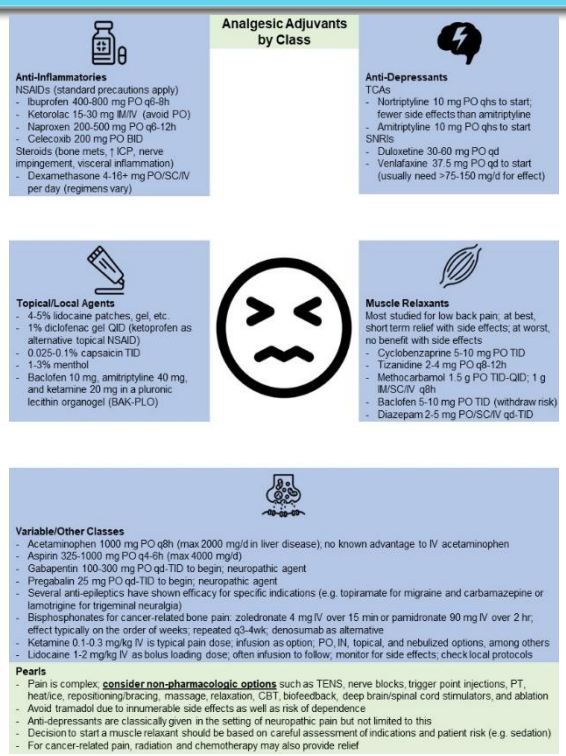
- Pain dose 0.1-0.3 mg/kg IV
- IV infusion for complex regional pain syndrome, neuropathic pain, and other intractable chronic pain states refractory to traditional agents
- Data suggests that infusions given for several hours over several days may provide weeks to months of pain relief
- Consider referral to our anesthesia/pain specialists

LIDOCAINE

Patient Weight	Recommended Dose
< 70 kg	0.5 mg/min
70-100 kg	0.75 mg/min
> 100 kg	1 mg/min (max 2 mg/min)

- Typically, high dose infusion limited to specialty pain services
- Need close cardiac monitoring, and be cautious in patients with cardiac disease, hypertension >160, co-administration with anti-arrhythmics, beta blockers

PalliEM.org



Analgesic Adjuvants by Class

Anti-Inflammatories
NSAIDs (standard precautions apply)
- Ibuprofen 400-800 mg PO q6-8h
- Ketorolac 15-30 mg IM/IV (avoid PO)
- Naproxen 200-500 mg PO q8-12h
- Celecoxib 200 mg PO BID

Steroids (bone mets, ↑ ICP, nerve impingement, visceral inflammation)
- Dexamethasone 4-16+ mg PO/SC/IV per day (regimens vary)

Anti-Depressants
TCAs
- Nortriptyline 10 mg PO qhs to start; fewer side effects than amitriptyline
- Amitriptyline 10 mg PO qhs to start

SNRIs
- Duloxetine 30-60 mg PO qd
- Venlafaxine 37.5 mg PO qd to start (usually need >75-150 mg/d for effect)

Topical/Local Agents
- 4-5% lidocaine patches, gel, etc.
- 1% diclofenac gel QID (ketoprofen as alternative topical NSAID)
- 0.025-0.1% capsaicin TID
- 1-3% menthol
- Baclofen 10 mg, amitriptyline 40 mg, and ketamine 20 mg in a pluronic lecithin organogel (BAK-PLO)

Muscle Relaxants
Most studied for low back pain; at best, short term relief with side effects; at worst, no benefit with side effects
- Cyclobenzaprine 5-10 mg PO TID
- Tizanidine 2-4 mg PO q8-12h
- Methocarbamol 1.5 g PO TID-QID; 1 g IM/SC/IV q8h
- Baclofen 5-10 mg PO TID (withdraw risk)
- Diazepam 2-5 mg PO/SC/IV qd-TID

Variable/Other Classes
- Acetaminophen 1000 mg PO q8h (max 2000 mg/d in liver disease); no known advantage to IV acetaminophen
- Aspirin 325-1000 mg PO q4-6h (max 4000 mg/d)
- Gabapentin 100-300 mg PO qd-TID to begin; neuropathic agent
- Pregabalin 25 mg PO qd-TID to begin; neuropathic agent
- Several anti-epileptics have shown efficacy for specific indications (e.g. topiramate for migraine and carbamazepine or lamotrigine for trigeminal neuralgia)
- Bisphosphonates for cancer-related bone pain: zoledronate 4 mg IV over 15 min or pamidronate 90 mg IV over 2 hr; effect typically on the order of weeks; repeated q3-4wk; denosumab as alternative
- Ketamine 0.1-0.3 mg/kg IV is typical pain dose; infusion as option; PO, IN, topical, and nebulized options, among others
- Lidocaine 1-2 mg/kg IV as bolus loading dose; often infusion to follow; monitor for side effects; check local protocols

Pearls
- Pain is complex; **consider non-pharmacologic options** such as TENS, nerve blocks, trigger point injections, PT, heat/ice, repositioning/bracing, massage, relaxation, CBT, biofeedback, deep brain/spinal cord stimulators, and ablation
- Avoid tramadol due to innumerable side effects as well as risk of dependence
- Anti-depressants are classically given in the setting of neuropathic pain but not limited to this
- Decision to start a muscle relaxant should be based on careful assessment of indications and patient risk (e.g. sedation)
- For cancer-related pain, radiation and chemotherapy may also provide relief

ADDITIONAL RESOURCE

REFERENCES

- Markwalter, D. Brooten, J. "Pain Adjuvants." Palliem.org
- Chou R, Peterson K, Helfand M. Comparative efficacy and safety of skeletal muscle relaxants for spasticity and musculoskeletal conditions: a systematic review. J Pain Symptom Manage. 2004;28(2):140–175.
- Hardek, B., et. al. Fast Fact 340: Skeletal Muscle Relaxants. Palliative Care Network of Wisconsin.
- Derry S, Moore RA, Gaskell H, et al. Topical NSAIDs for acute musculoskeletal pain in adults. Cochrane Database Syst Rev 2015; :CD007402.
- See, S. Choosing a Skeletal Muscle Relaxant. American Family Physician. 2008 Aug 1;78(3):365-70.

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4689236/
- Challapalli V, Tremont-Lukats IW, McNicol ED, et al. Systemic administration of local anesthetic agents to relieve neuropathic pain. Cochrane Database Syst Rev 2005; :CD003345. Iacob E, Hagn EE, Sindt J, et al. Tertiary Care Clinical Experience with Intravenous Lidocaine Infusions for the Treatment of Chronic Pain. Pain Med 2018; 19:1245.