# Colorado ALTO Project


## Pharmacy Training

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# Pharmacy Training Learning Objectives

- Describe the appropriate use of alternatives to opioids for treatment of different types of pain in the ED
- Review the implementation of an opioid-reduction process and policy
- Present the results of a pre- and post-implementation pilot study

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# All Patients Have a Right to Pain Control


The Medical Minute. The Opioid Crisis: Solutions for Colorado.
1999 Veterans Health Administration Memorandum: Pain as the Fifth Vital Sign. March 1, 1999.

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# ALTO Pilot – Colorado ACEP Guidelines

- Non-opioid medications first
- Opioids as rescue therapy
- Multimodal and holistic pain management
- Pathways:
  - Kidney stones
  - Low back pain
  - Fractures
  - Headache
  - Chronic abdominal pain


www.coacep.org

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# ALTO Approach

- Multi-modal non-opioid approach to analgesia for specific conditions
- **Goals:** To utilize non-opioid approaches as first-line therapy and educate our patients:
  - Opioids will be second-line treatment
  - Opioids can be given as rescue medication
  - Discuss realistic pain management goals
  - Discuss addiction potential and side effects of opioids

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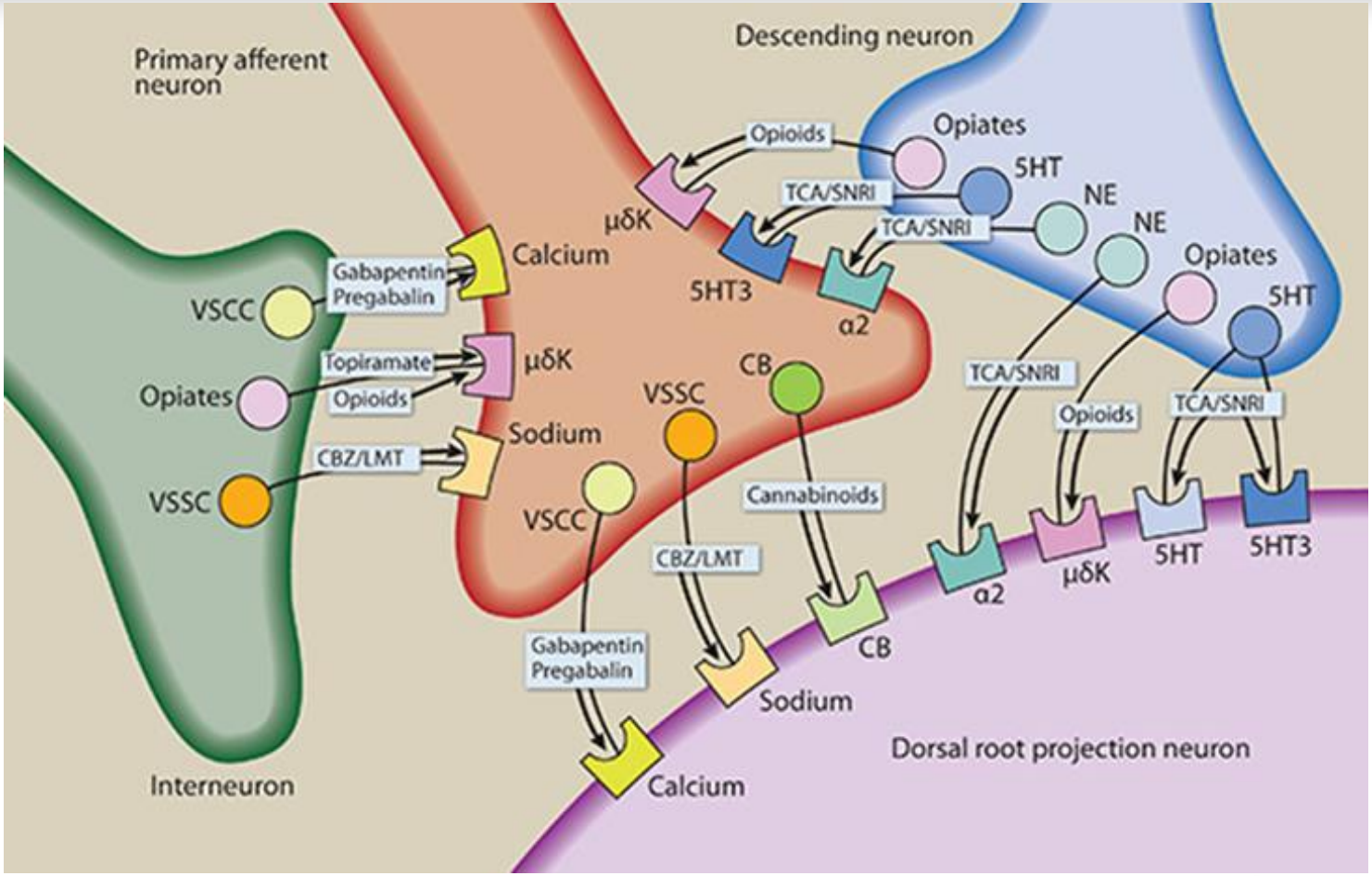
# CERTA Approach




http://www.propofology.com/infographs/certa-concept-of-analgesia

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# Examples

- **C**hannels:
  - Sodium (Lidocaine)
  - Calcium (Gabapentin)
- **E**nzymes:
  - COX 1,2,3 (NSAIDS)
- **R**eceptors:
  - MOP/DOP/KOP (Opioids)
  - NMDA (Ketamine/Magnesium)
  - GABA(Gabapentin/Sodium Valproate)
  - 5HT1-4(Haloperidol/Ondansetron/Metoclopramide)
  - D1-2(Haloperidol/Chlorpromazine/Prochlorperazine)

# Lidocaine

- Acts on central and peripheral voltage dependent sodium channels, G protein-coupled receptors and NMDA receptors
- Used **topically**, **intravenously** or as **trigger point injections**
  - When used at low doses, IV lidocaine is generally benign
  - **Caution** should be used when giving IV to patients with a severe cardiac history
- MSK, migraines, renal colic, abdominal, neuropathic
- Lidocaine patches are great for pain!
- Lidocaine IV doses ≤ 1.5 mg/kg over 10-60 min may be given in non-ICU areas (max 200 mg/dose)


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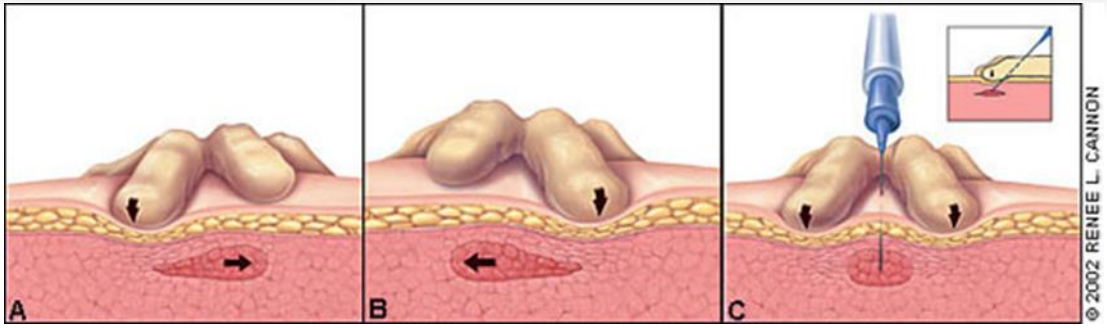
# Studies

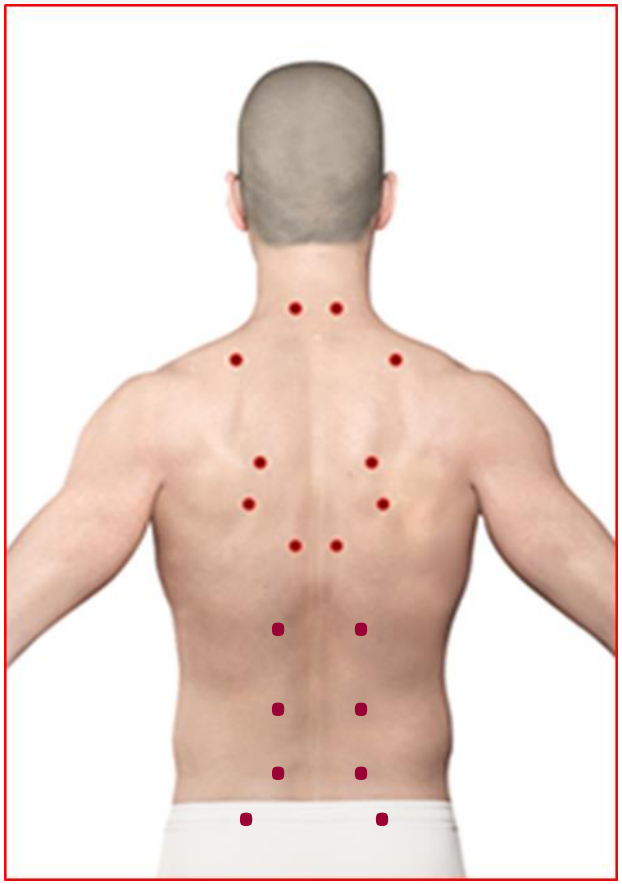
| Author, Year Type of Study | Research Question | n | Comparator | Results |
|---|---|---|---|---|
| **Soleimanpour, 2012 Randomized controlled trial** | IV lidocaine vs morphine for ED patients with renal colic | 240 | Morphine | Pain score at 5 min lido vs morphine 65% vs 53% (p=0.0002)<br>Successful treatment 90% vs 70% in lido vs morphine (p=0.0001) |
| **Vahidi, 2015 Randomized controlled trial** | IV lidocaine vs morphine in ED patients with critical limb ischemia | 63 | Morphine | At 15 and 30 min, the mean VAS score in the lido group was less than morphine group (5.7 vs 7, 95% CI 0.1 -2.4) and (4.2 vs 6.5, 95% CI 1.2 to 3.2) |
| **Firouzian, 2015 Randomized controlled trial** | Does lidocaine as an adjuvant to morphine improve pain relief in ED patients with acute renal colic? | 89 | Morphine+ NS | Median time to pain free in the lido vs NS group was 87 min vs 100 min (p=0.071)<br>The median nausea free times in the lido vs NS group were 26 min vs 58 min (p<0.0001) |

# Trigger Point Injections




Indications:
- Myofascial Pain Syndrome
- Headaches - tension and migraines
- Musculoskeletal back pain
- Torticollis
- Trapezius strain

Concerns:
- Infection
- Hematoma
- Arterial injection (Bupivacaine)
- PTX on chest



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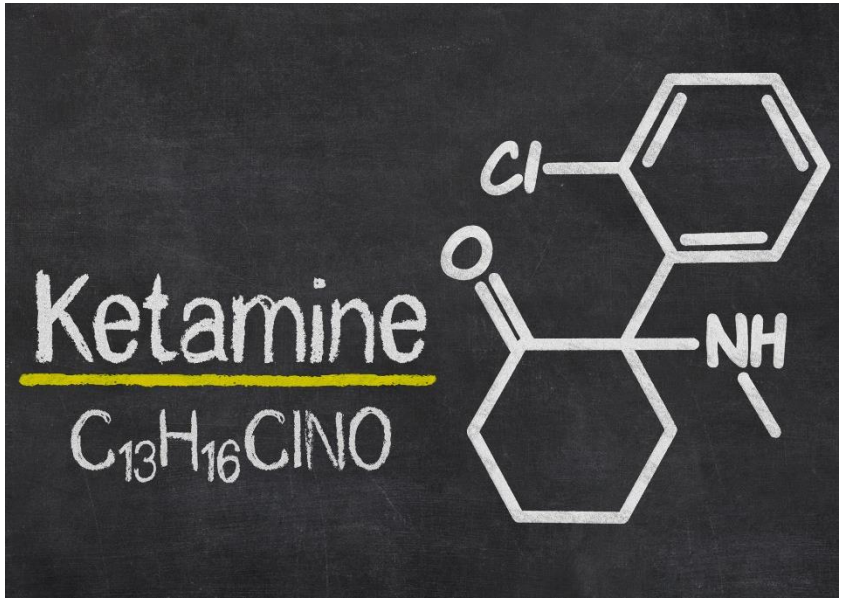
# Ketamine

- NMDA receptor antagonist
- When used at low doses, it is generally benign
- Used **intranasally** or **intravenously**
- Should not be used in patients with PTSD

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# Ketamine

- Ketamine effect is dose-dependent
- May be used for analgesia at doses ≤ 0.2 mg/kg via slow IVP or 0.1 mg/kg/hr infusion
  - May be given in non-ICU areas
  - Slow administration rate (≥ 10 min) = less adverse effects
- Ketamine 50 mg IN can also be given
  - No IV access
- Can be used adjunctively with opioids to reduce opioid requirements

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# Studies

| Author, Year Type of Study | Research Question | n | Comparator | Results |
|---|---|---|---|---|
| **Motov, 2015 Randomized controlled trial** | IV sub dissociative dose ketamine vs morphine for analgesia in the ED | 45 | Morphine | Change in mean pain scores not different in the ketamine vs. morphine (P=0.97)<br>No difference in rescue fentanyl at 30 and 60 min |
| **Shrestha, 2016 Cross sectional observational study** | IN ketamine in the treatment of acute pain in the ED | 39 | None | IN ketamine 0.7 mg/kg = significant pain relief (>20 mm in VAS) at 15 min, which ↑ to 100% at 30 and 60 min |
| **Lee, 2016 Systematic Review and Meta-Analysis** | Effects of low dose ketamine on acute pain in the ED | 6 trials n=438 | None | Favorable effects of ketamine ≥ opioids<br>Low dose ketamine = ↑ risk of neuro and psych events |
| **Farina, 2017 Randomized controlled trial** | IN ketamine vs IV morphine in pain reduction in ED patients w/ renal colic | 53 | Morphine | Difference in mean VAS score at 5 min, morphine > ketamine<br>At 15 and 30 min, no difference between groups |

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# Other Options

- Ketorolac
  - 15 mg for everyone (IV or IM)
    - No difference in pain reduction with 30 vs. 15 mg
  - Great for many pain indications including musculoskeletal pain and renal colic


- Haloperidol
  - Low dose (2.5-5 mg IV)
  - Great for nausea
    - Cannabinoid induced hyperemesis


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# Other Options

- Dicyclomine
  - Antispasmodic and anticholinergic agent that acts to alleviate smooth muscle spasms in the GI tract
  - 20 mg PO/IM (NOT IV!)
  - Great for abdominal pain
  - Caution in elderly


Photo source: MedicaLook

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# ED Pain Pathways

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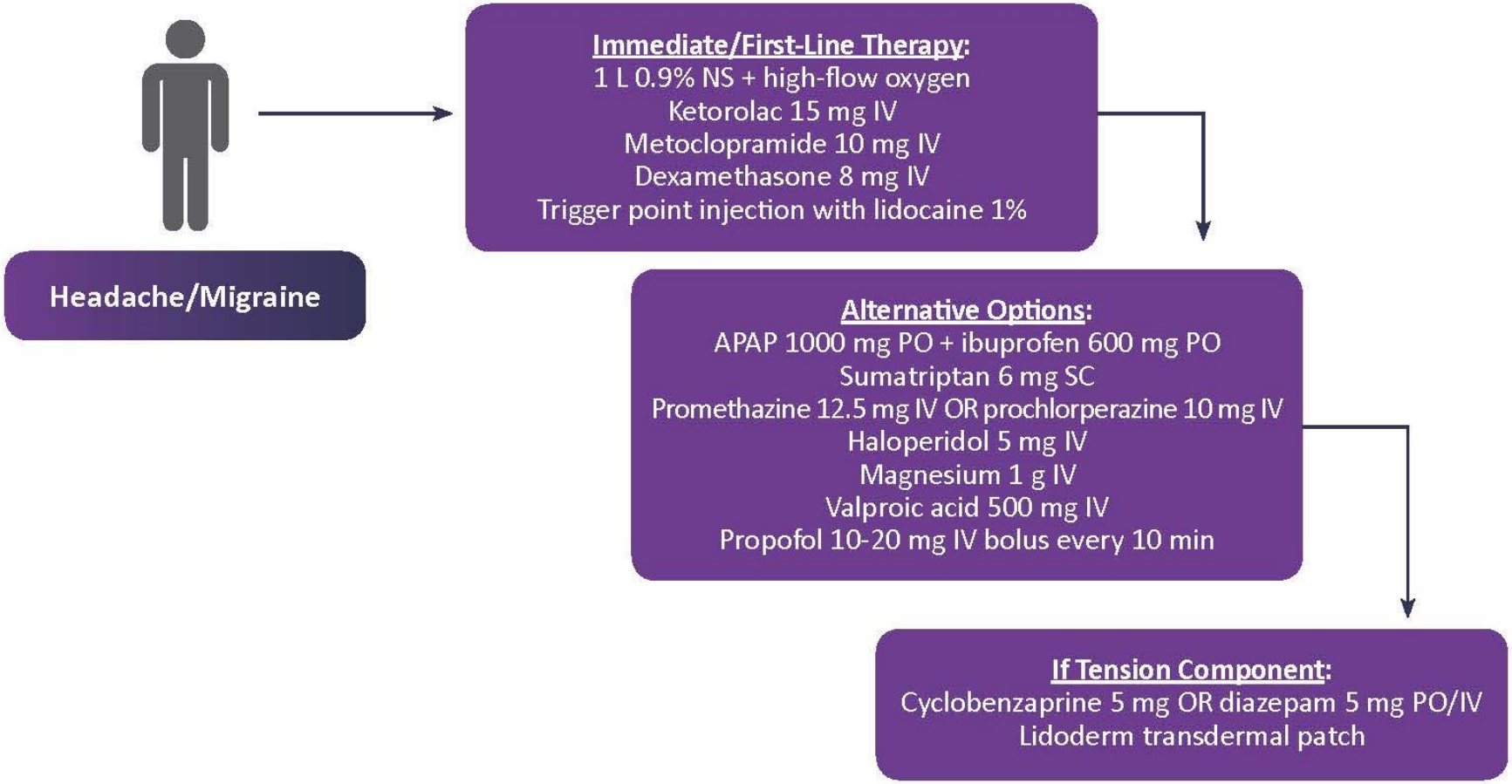
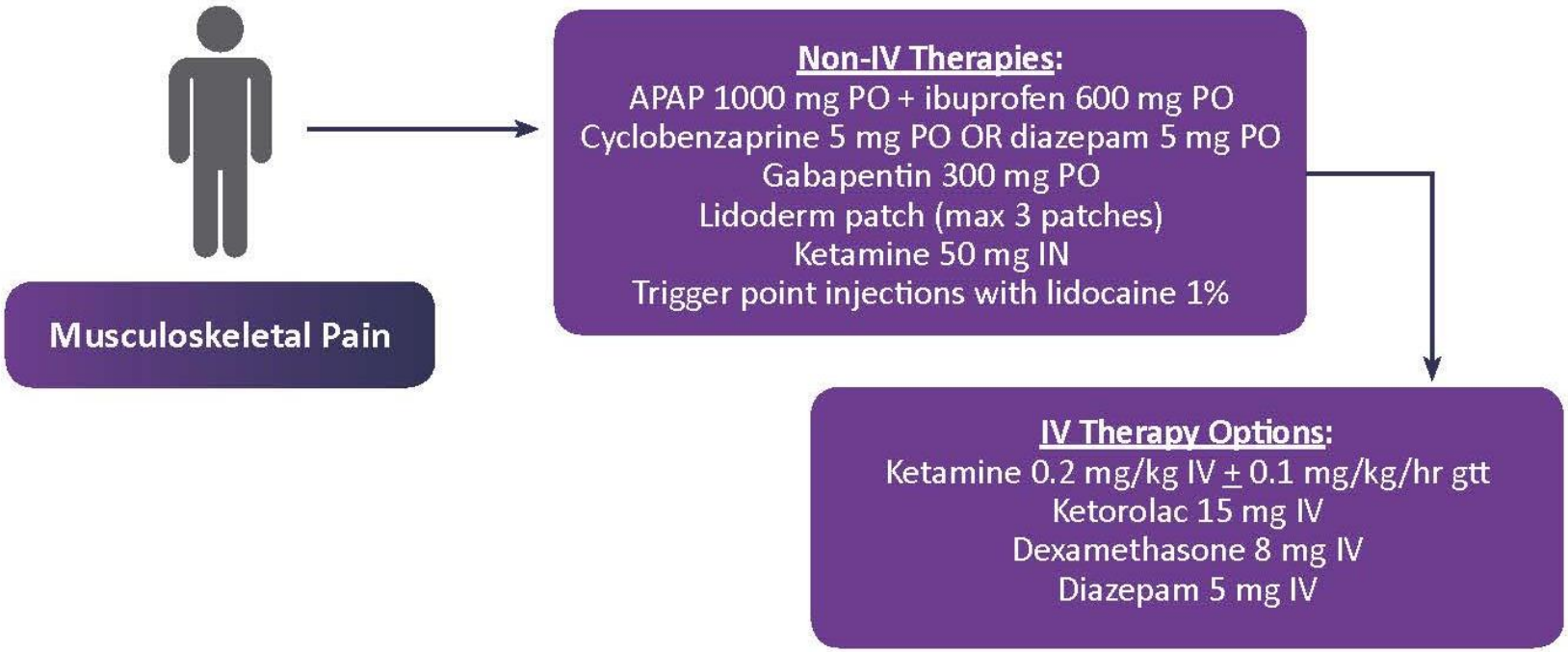
# Headache/Migraine



# Musculoskeletal Pain

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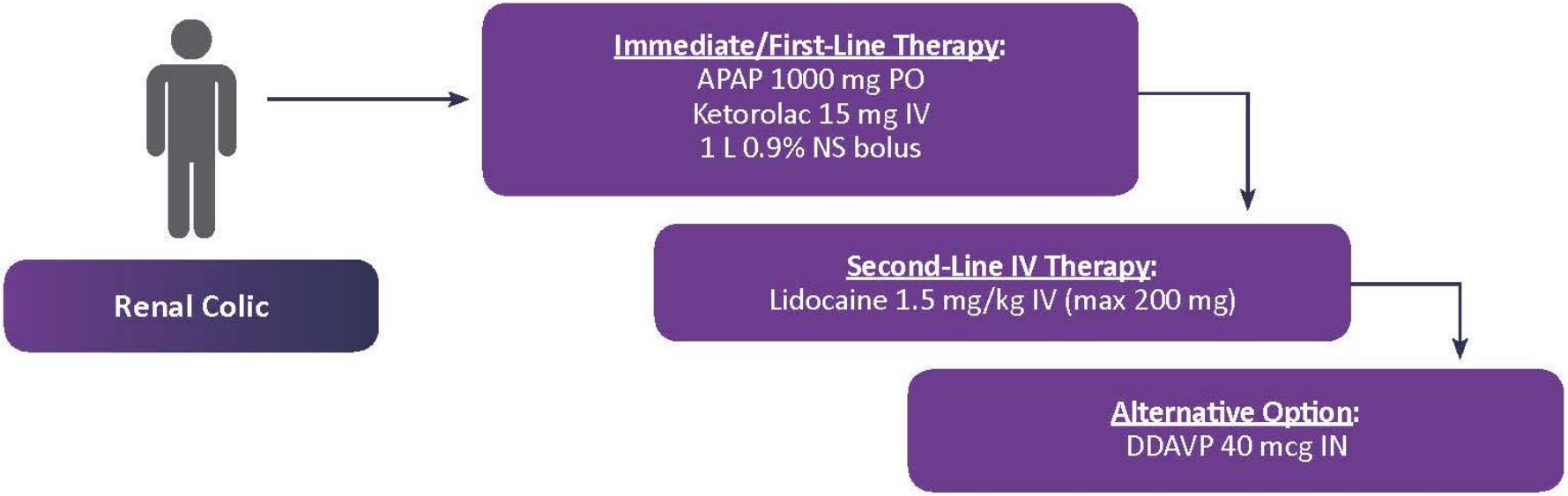
# Renal Colic

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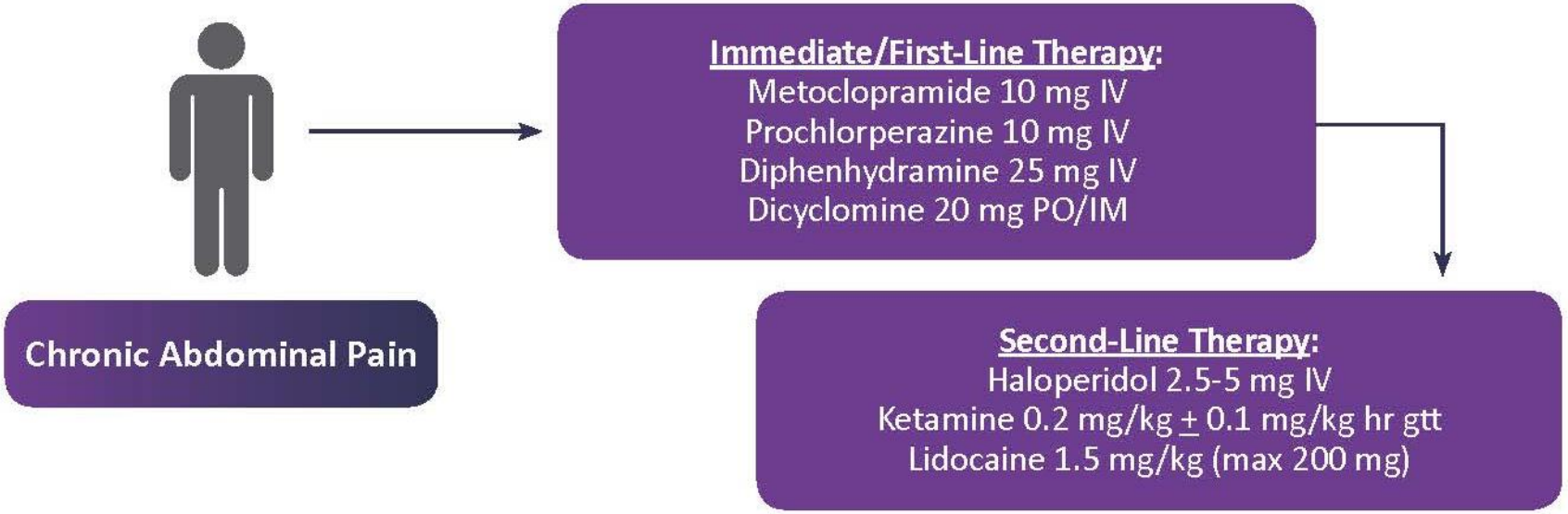
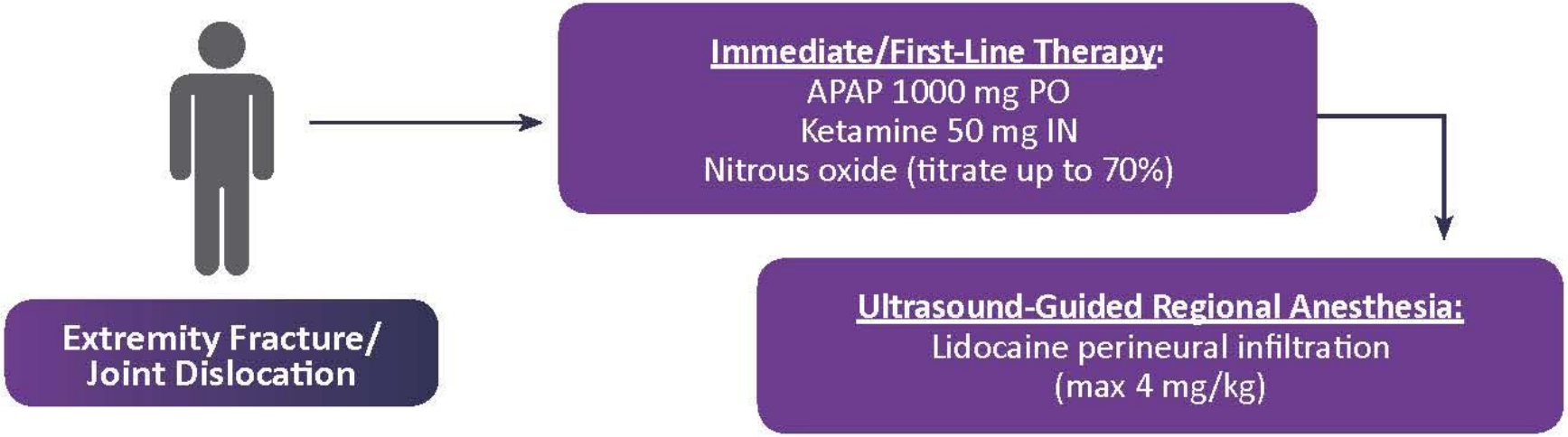
# Chronic Abdominal Pain



# Extremity Fracture/Joint Dislocation

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# Implementation: Is this possible?

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# Project Champions

- ED Nursing
  - Director, charge RNs, staff
- ED Physicians
  - Director, staff
- Hospital Leadership
  - CEO, CNO, CMO
- Other Support
  - Quality improvement
  - IT/data support
  - Pharmacy
  - Communications/marketing

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# Policy Changes

- Procedural Sedation
  - Ketamine dosing – clearly define analgesia vs sedation doses
    - < 0.25 mg/kg slow IVP = analgesia
    - ≥ 1 mg/kg slow IVP = sedation = “timeout”
- High-Risk Medication Administration
  - Lidocaine administration
    - 1.5 mg/kg bolus over 10-60 min = non-ICU areas
    - Cardiac lidocaine = ICU
  - Ketamine administration
    - < 0.25 mg/kg slow IVP $\pm$ 0.1 mg/kg/hr x 48 hrs max = non-ICU areas
    - 1-2 mg/kg IV + 5-30 mg/hr = ICU

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# Pharmacy/IT Support

- Education
  - Nurses, physicians, pharmacists
- CPOE
  - Creation of pain treatment order set
  - Create order strings for unique entries – clearly label “for pain”

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# Pharmacy/IT Support

- Smart Pumps
  - Addition of new medications – clearly label “for pain”
    - Lidocaine
      - Bolus = 1.5 mg/kg in 100 mL NS over 10 min
    - Ketamine
      - Bolus = 50 mg/5 mL prefilled syringe entry to infuse over 10 min
      - Gtt = 100 mg/50 mL NS max 0.1 mg/kg/hr

# Timeline for Success

## 4 months

- Read CO-ACEP 2017 *Opioid Prescribing & Treatment Guidelines*
  - Individualize to your facility
- Medication Supply
  - Formulary additions/changes
  - Automated dispensing machines in ED
    - Stock all ALTO medications that you can
    - Individualized medications STAT from IP pharmacy
- Collaborate for optimization of administration policies for ALTO medications
  - ALTO ketamine/lidocaine - medical unit
  - Procedural sedation cutoffs for ketamine

## 3 months

- Data
  - Organization/system IT champion and data champion create order entries
    - Clearly labeled individual entries
    - Order set(s)

## 2 months

- Secure medication approval and stock medications in ED
  - Ketamine
  - Lidocaine Patches
  - Haloperidol
  - Ketorolac
  - Capsaicin Topical
  - Gabapentin
- Update smart pump medication libraries
  - Standard concentration
  - Dosage/indication
  - Max dose limits
- Educate pharmacy staff on ALTO therapies

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# Timeline for Success

## 1 month

- TEST RUN!!!
- All needed supplies/equipment ready
- Data Report
  - Run beta test report
  - IT/data champion look it over
  - Clinical Audit
    - Provider, pharmacist or nurse with great understanding of the ALTO medications and what should be appearing on the data report
    - Reporting only in mcg/mg/g?
    - No prepacks/discharge medications on report?
    - Note revisions/adjustments and work closely with IT/data champion to resolve

## 2 weeks

- Ensure smart pumps are updated and working
- Nurse education complete
- Provider education complete/questions answered
- Beta test data reports and audit again/issues resolved?
- Ensure stocking of medications is complete

## 1 week

- Final planning/quality meetings
- Check for and remove any remaining barriers
- Continue to refine data report if all issues not resolved

# Data Collection

- **Primary outcome:** Change in ED opioid use pre- and post-implementation
  - Measured in morphine dosing equivalents
  - Per ED patient visit
- **Secondary outcome: Patient satisfaction (Press Ganey Scores)**
  - How likely are you to recommend this facility?
  - How well was your pain controlled?

**All data organized by month*

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# Partners




COLORADO CHAPTER
**American College of Emergency Physicians**
ADVANCING EMERGENCY CARE

# Questions?

## Resources

www.cha.com/ALTO

## Pharmacy Contact Information

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# *You save lives every day … Thank you.*

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