Breaking Free in the ED: Using Alternative Pain Management Options to Confront the Opioid Crisis

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Learning Objectives

- Describe the current opioid epidemic and the need for decreasing opioid use
- Discuss how to treat different pain indications using the ALTO approach
- Identify non-pharmacologic and opioid-sparing options to pain control
- Explain the safe us of novel alternative agents in pain management
- Determine if an opioid reduction protocol is appropriate for your emergency department

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Notes

- CE Code: Process & claim within 60 days. CE code will be shared later during the presentation.
- Handout: PDF link in your control panel.
- Polling questions: click directly on your screen to select response.
- Participants are placed on mute.
- To ask a question use the chat box in your control panel.
- Feedback survey upon exiting webinar.

Speakers & Disclosure

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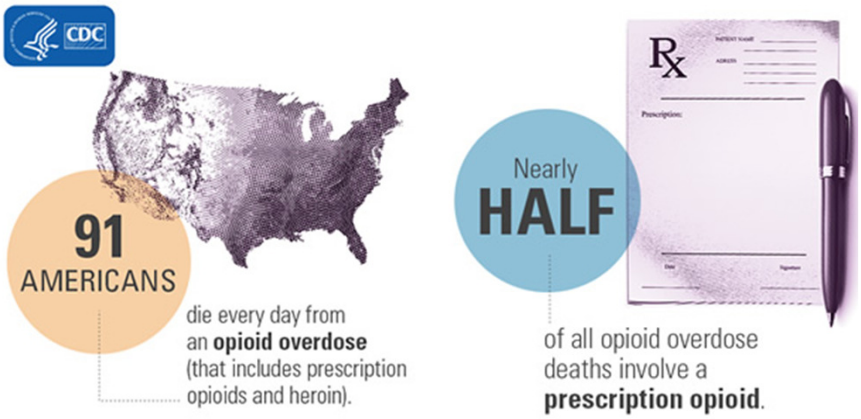
Faculty, speakers, and ASHP staff report no relevant financial relationships pertinent to this activity

Background



www.CDC.gov/drugoverodse/epidemic/

Background

- The United States has 10% of the world's population, yet consumes more than 80% of the world's opioids
- In 2010, opioid consumption was 710 MME per person in the US on a yearly basis

The Medical Minute. The Opioid Crisis: Solutions for Colorado.

Opioids DO NOT Cause Addiction

Study published in 1986

- Small (38 patients)
- Unknown selection criteria
- Not randomized, not blinded
- 2/3 of patients received 20 MME (morphine milligram equivalence)/day or less

Conclusion:
Risk of addiction when treating chronic pain was less than one percent

Pain. 1986 May;25(2):171-86

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.

Pharmaceutical Industry

$$ spent in marketing and advertising of products

- **Ex: 2007—Purdue Pharma pled guilty to federal criminal charges for misleading advertisement regarding the safety of OxyContin time release**
  - **Fined:** $600,000,000
  - **Sales:** $22,000,000,000 over the past decade
  - **2010**—Reformulated OxyContin to make it more difficult to inject or snort

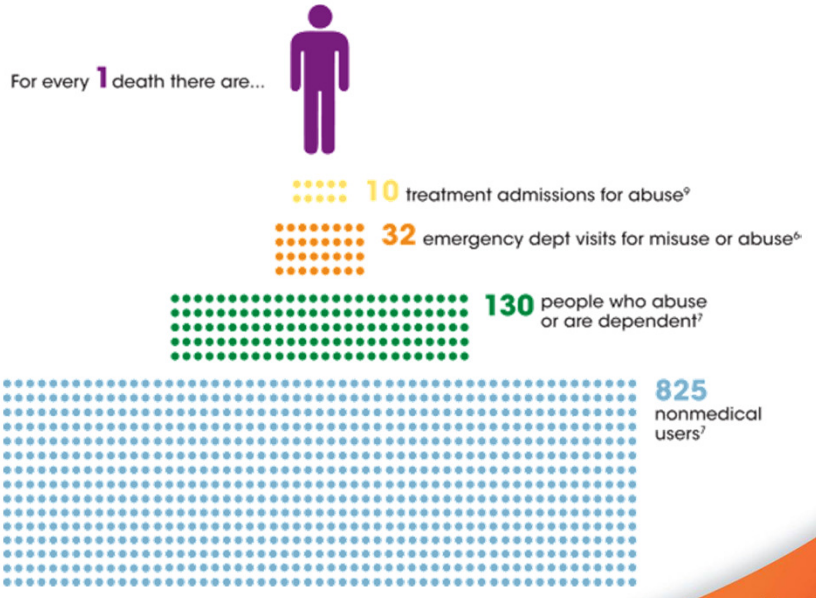
The New York Times. In Guilty Plea, OxyContin Maker to Pay $600 Million

Colorado

- **Colorado is #12 in the country for misuse and abuse of prescription opioids**
- **4/10 of Coloradan adults admit to misuse of prescription medication, primarily pain killers**
- **Colorado death rate from opioid overdose tops the national average**
- **Roughly two thirds of overdose deaths are from pharmaceuticals and one third are from heroin**

http://www.cpr.org/news/story/colorado-drug-overdoses-almost-every-county-and-ahead-national-average

Colorado Consortium for Prescription Drug Abuse Prevention.



What is the answer??

Colorado Consortium for Prescription Drug Abuse Prevention.

Polling Question

91 Americans die each day from an opioid overdose. Of these, which % is due to prescription opioids?

A. < 10%

B. 50% nationally

C. 66% in Colorado

D. B and C

ALTO Approach

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Alternatives To Opioids

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

LaPietra A. ALTO℠ Program.

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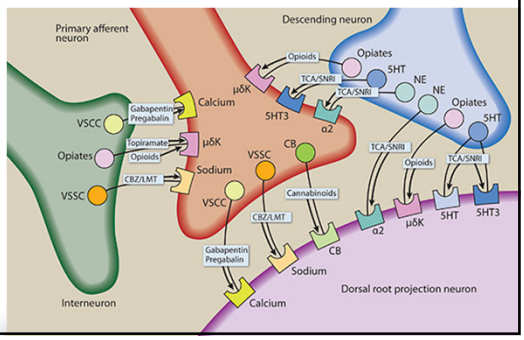
CERTA Approach

- **Channels/Enzymes/Receptors Targeted Analgesia**
- **Shift from a symptom based approach to a mechanistic approach**
- **Targeted, patient-focused analgesic approach utilizing combinations of non-opioid analgesics**
- **Results in**
  - Greater analgesia
  - Reduced doses of each medication
  - Fewer side effects
  - Shorter length of stay



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

Examples

- **Channels:**
  - Sodium (Lidocaine)
  - Calcium (Gabapentin)
- **Enzymes:**
  - COX 1,2,3 (NSAIDS)
- **Receptors:**
  - MOP/DOP/KOP (Opioids)
  - NMDA (Ketamine/Magnesium)
  - GABA(Gabapentin/Sodium Valproate)
  - 5HT1-4(Haloperidol/Ondansetron/Metoclopramide)
  - D1-2(Haloperidol/Chlorpromazine/Prochlorperazine)

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

Pain Management Approaches

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Non-Pharmacologic Therapies

- **Warm/Cold compresses**
- **Positioning**
- **Transcutaneous electrical nerve stimulation**
- **Cognitive counseling, training, and coaching**
- **Acupuncture**
  - Prospective RCT of morphine vs. acupuncture for acute pain
  - Primary endpoint: 50% decrease in pain severity score
  - Acupuncture 92% vs. morphine 78% ($p < 0.001$)

Grissa MH, et al. *Am J Emerg Med.* 2016;34:2112-16.

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Opioid Alternatives

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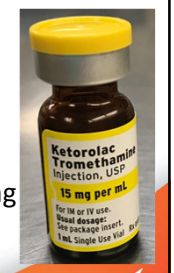
Opioid-Sparing Options

- **Acetaminophen (APAP)**
  - Multiple routes of administration
  - Always assess medications taken prior to arrival to the ED
- **NSAIDS**
  - Multiple routes (PO, IV, and topical routes available)
  - Ceiling dose
    - No difference in pain reduction with 30 vs. 15 vs. 10 mg



Motov S. *Ann Emerg Med* 2016.
https://pharmertoxguy.com/2016/12/16/the-ceiling-effect-of-iv-ketorolac/

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Lidocaine

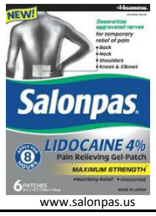
- **Acts on central and peripheral voltage dependent sodium channels, G protein-coupled receptors, and NMDA receptors**
- **Used topically, intravenously, nerve blocks, or in trigger point injections**
  - Used for musculoskeletal (MSK), migraines, renal colic, abdominal, and neuropathic pain
- **When used at low doses, IV lidocaine is generally benign**
  - Most common adverse effects: dizziness, tingling sensation,
  - Caution in patients with cardiac history

Lidocaine

- **IV Lidocaine**
  - Dose ≤ 1.5 mg/kg IV over 10 min
  - Recommend a max 200 mg/dose
  - Dilute in 50 or 100mL of NS

www.prnewswire.com

- **Topical lidocaine**
  - Prescription and over-the-counter options



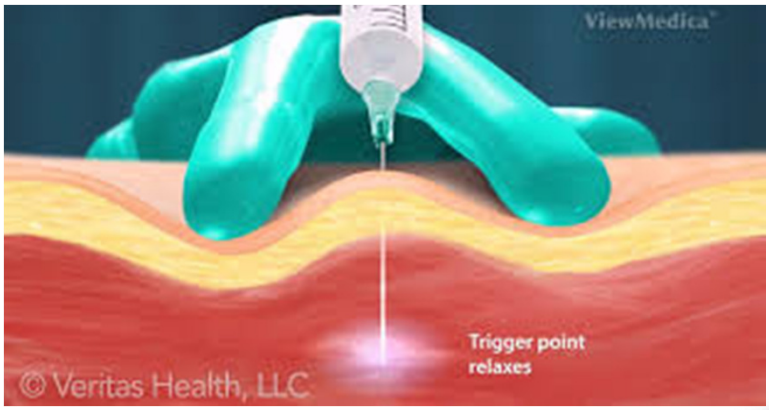
www.salonpas.us

Lidocaine

- **Soleimanpour et al, 2012**
  - Pain score at 5 min lidocaine vs. morphine 65% vs. 53% (p=0.0002)
  - Successful treatment 90% vs. 70% in lidocaine vs. morphine (p=0.0001)
- **Firouzian et al, 2015**
  - Morphine + lidocaine vs. morphine + placebo
  - Median time to pain free was 87 min vs. 100 min (p=0.071)
- **Vahidi et al, 2015**
  - Lidocaine vs. morphine
  - At 15 & 30 min, the mean VAS score in the lidocaine group was < morphine group (5.7 vs. 7, 95% CI: 0.1 -2.4) & (4.2 vs. 6.5, 95% CI: 1.2 to 3.2)

Soleimanpour H, et al. *BMC Urology.* 2012;12:13.
Firouzian A, et al. *Am J Emerg Med.* 2016;34:443-8.
Vahidi E, et al. *Emerg Med J.* 2015;32:516-9.

Trigger Point Injections



www.spineandpain.com

Polling Question

What is the mechanism of action of Lidocaine?

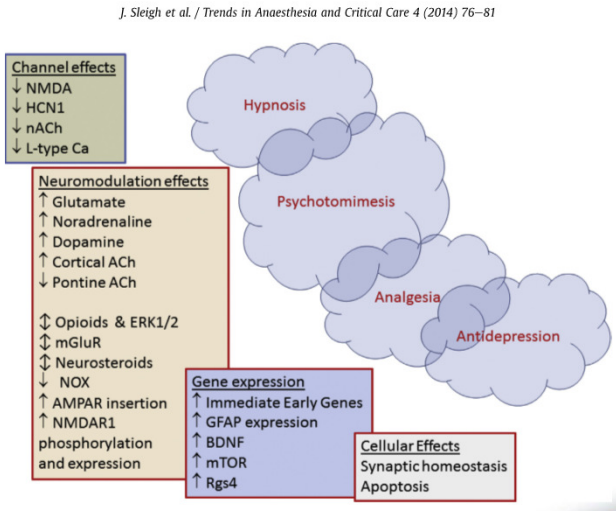
A. Acts on centrally located voltage dependent sodium channels

B. Acts on central and peripheral voltage dependent sodium channels, G protein-coupled receptors, and NMDA receptors

C. Agonizes dopamine and serotonin receptors

D. Antagonizes NMDA and dopamine receptors in the central nervous system

Ketamine



Ketamine

- **Ketamine use is dose-dependent**
  - Sub-dissociative vs. dissociative
- **Analgesic doses 0.1-0.5 mg/kg**
  - Administration slow IVP or diluted in 100mL NS over 10 mins
  - Also evidence for an infusion 0.1 mg/kg/hr infusion

Motov S. *Am J Emerg Med.* 2017 Mar 3. [epub ahead of print].

Ketamine

- **Ketamine intranasal (IN)**
  - 0.5-1 mg/kg IN
  - Bioavailability ~40-50%
  - Onset ~10-20 minutes
  - Be careful of volume
- **Adverse effects**
  - Emergence phenomena
  - Local irritation

Farnia MR, et al. *Am J Emerg Med.* 2017;35:434-37.
Shimonovich S, et al. BMC Emerg Med. 2016;16:43.

Ketamine

- Can be used adjunctively with opioids to reduce opioid requirements
- Opioid-induced hyperalgesia
- Be cautious with different concentrations
  - 100mg/mL, 50mg/mL, 10mg/mL
- Avoid in patients with post-traumatic stress disorder

Polling Question

In what patient should you avoid ketamine?

A. 26 year old male with joint dislocation

B. 36 year old male with severe PTSD

C. 38 year old female with a history of drug abuse

D. 64 year old male with a history of orthostatic hypotension

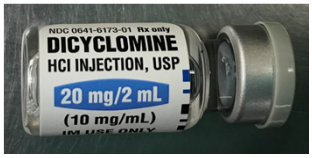
Other Options

- **Skeletal muscle relaxants**
  - Recent RCT showed no add-on benefit of cyclobenzaprine (or APAP/oxycodone) to naproxen for acute low-back pain
  - Lack of strong evidence to support for chronic pain exacerbations
  - Concerning adverse effects-CNS and anticholinergic
- **Haloperidol**
  - Nausea
    - Cannabinoid induced hyperemesis
  - Low dose (2.5 mg IV)

Freidman BW, et al. *JAMA*.2015;314:1572-1580.

Other Options

- **Dicyclomine**
  - MOA: 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 (think cramps)
  - Caution in elderly



ED Pain Pathways

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Headache/Migraine

1st Line/Immediate
1 L 0.9% NS + high-flow oxygen
Ketorolac 15 mg IV
Dexamethasone 10 mg IV
Metoclopramide 10 mg IV
Trigger point injection with lidocaine 1%

2nd Line/Alternative
APAP 1000 mg PO + IBU 600 mg PO
Promethazine 12.5 mg IV OR prochlorperazine 10 mg IV
Haloperidol 2.5 mg IV
DHE 1 mg IV OR Sumatriptan 6 mg SC
Magnesium 1 g IV
Valproic acid 500 mg IV
Lidocaine 1.5 mg/kg IV

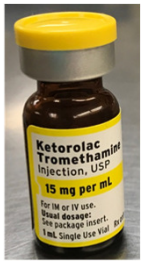
Musculoskeletal Pain

Non-IV Options
APAP 1000 mg PO + IBU 600 mg PO
Cyclobenzaprine 5 mg PO OR diazepam 5 mg PO
Gabapentin 300-600 mg PO
Lidocaine 5% Patch TD
Ketamine 50 mg IN
Trigger point injections 1-2 mL lidocaine 1%

IV Options
Ketamine 0.2 mg/kg IV + 0.1 mg/kg/hr gtt
Ketorolac 15 mg IV
Dexamethasone 8 mg IV
Diazepam 5 mg IV

Renal Colic

1st Line/Immediate
Ketorolac 15 mg IV
Acetaminophen 1000 mg PO
1 L 0.9% NS bolus



- **2nd Line**
- Lidocaine 1.5 mg/kg IV

Alternative
DDAVP 40 mcg IN
Ketamine 50 mg IN

Polling Question

A patient presents with renal colic. What are some opioid-free alternative treatment options?

A. Lidocaine 1.5 mg/kg IV over 10 min
B. Ketamine 50 mg IN
C. DDAVP 40 mcg IN
D. All of the above

Implementation: Is This Possible?

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Project Champions

- **ED Nursing**
  - Director, charge RNs, staff
- **ED Physicians**
  - Director, staff
- **Hospital Leadership**
  - CNO, CMO, CEO
- **Other Support**
  - IT
  - Pharmacy

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”

Policy Changes

- **High-risk Medication Administration**
  - Lidocaine administration
    - 1.5 mg/kg bolus + 1-2 mg/kg/hr drip x 24 hrs max = non-ICU areas
    - Cardiac lidocaine = ICU
  - Ketamine administration
    - < 0.25 mg/kg slow IVP + 0.1 mg/kg/hr x 48 hrs max = non-ICU areas
    - 1-2 mg/kg IV + 5-30 mg/hr = CCU

Pharmacy/IT Support

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

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
      - Gtt = 2 g/250 mL D5W premix bag max 2 mg/kg/hr
    - Ketamine
      - Bolus = 50 mg/5 mL prefilled syringe entry to infuse over 5-10 min
      - Gtt = 100 mg/50 mL NS max 0.1 mg/kg/hr

Timeline For Success

6 months prior	• Work with IT to create ED ALTO order set • Begin educating nurses and physicians on new medications and scripting
3 months prior	• Update high risk medication administration policy • Update conscious sedation policy to ensure ketamine can be administered in non-ICU areas
1 month prior	• Stock medications in ED • Program smart pumps for new medications

Success In Action: Swedish ED Pilot Results

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Swedish Timeline

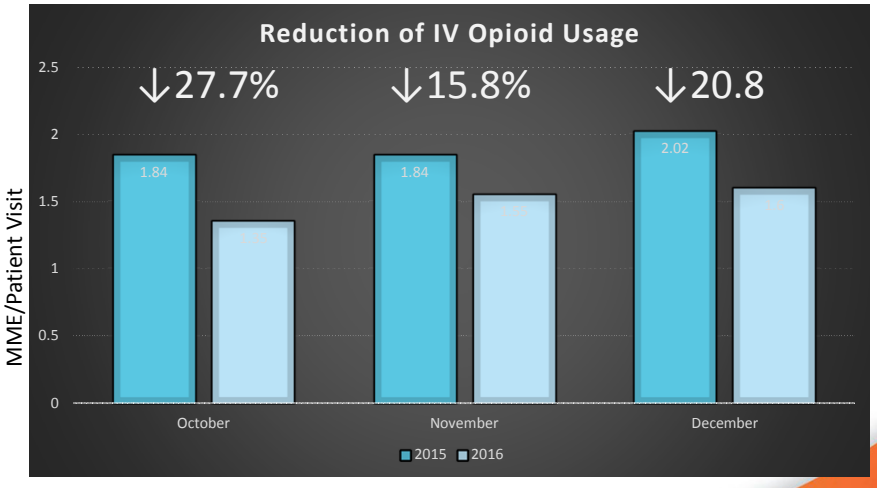
Pre-Implementation	• October-December 2015
Go Live	• September 2016
Post-Implementation	• October-December 2016

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**

Swedish Results*



n=14,559
*Mean MME/visit in 2015 vs 2016 = 1.9 MME/visit vs 1.5 MME/visit (p=0.0146)

Press Ganey Patient Satisfaction Scores

How well was your pain controlled?	**2015**: 56.3% **2016**: 59.2%	↑2.9% p=0.83
How likely are you to recommend this ED?	**2015**: 71.0% **2016**: 71.3%	↑0.3% p=0.98

*No significant difference between 2015 and 2016 responses when Adjusted for age, sex, and race

What's Next?
Statewide Go-Live

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Opioid Taskforce

- **Colorado ACEP**
  - Formed an Opioid Taskforce in summer 2016
  - Goal = write Opioid Guidelines for ED providers
  - Released 1st draft in February 2017
    - Published in June 2017
  - Encompasses
    - Limiting opioids in the ED
      - Promoting the use of alternatives (**ALTO**)
    - Treatment and referral
      - Suboxone use
    - Harm reduction
      - Naloxone kits
      - Clean syringes
    - Education
      - Risks of opioids
      - Safety

Opioid Taskforce

- **Opioid reduction collaborative**
  - CO ACEP Opioid Taskforce
  - Colorado Hospital Association
  - Swedish Medical Center ED Opioid Reduction Pilot
  - Colorado Consortium
  - Colorado Emergency Nurses Association
- **Expand Swedish pilot to other ED sites in CO**
  - 11 pilots sites
    - Go-live in June 2017
    - Data collection – 6 months
  - Goal = all EDs implement CO ACEP Opioid Guidelines by end of 2018

QUESTIONS

Thank you for attending!

- Remember to process and claim your CE credit no later than 60 days from today at elearning.ashp.org

Classroom Attendance Code: L02071

- Please send any remaining questions to sections@ashp.org