ALTO in the ED

Alternatives to Opioids

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Conflict of Interest Disclosure

Rachael Duncan has no financial relationships to disclose.

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Learning Outcomes

- Identify contributing factors to the national opioid epidemic
- Describe the current state of the opioid epidemic in West Virginia
- Introduce the concept of Alternatives to Opioids (ALTOs) to appropriately treat pain
- Discuss the novel use of ketamine, lidocaine, haloperidol, and ketorolac for the management of pain, along with cautions

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Opioid Epidemic

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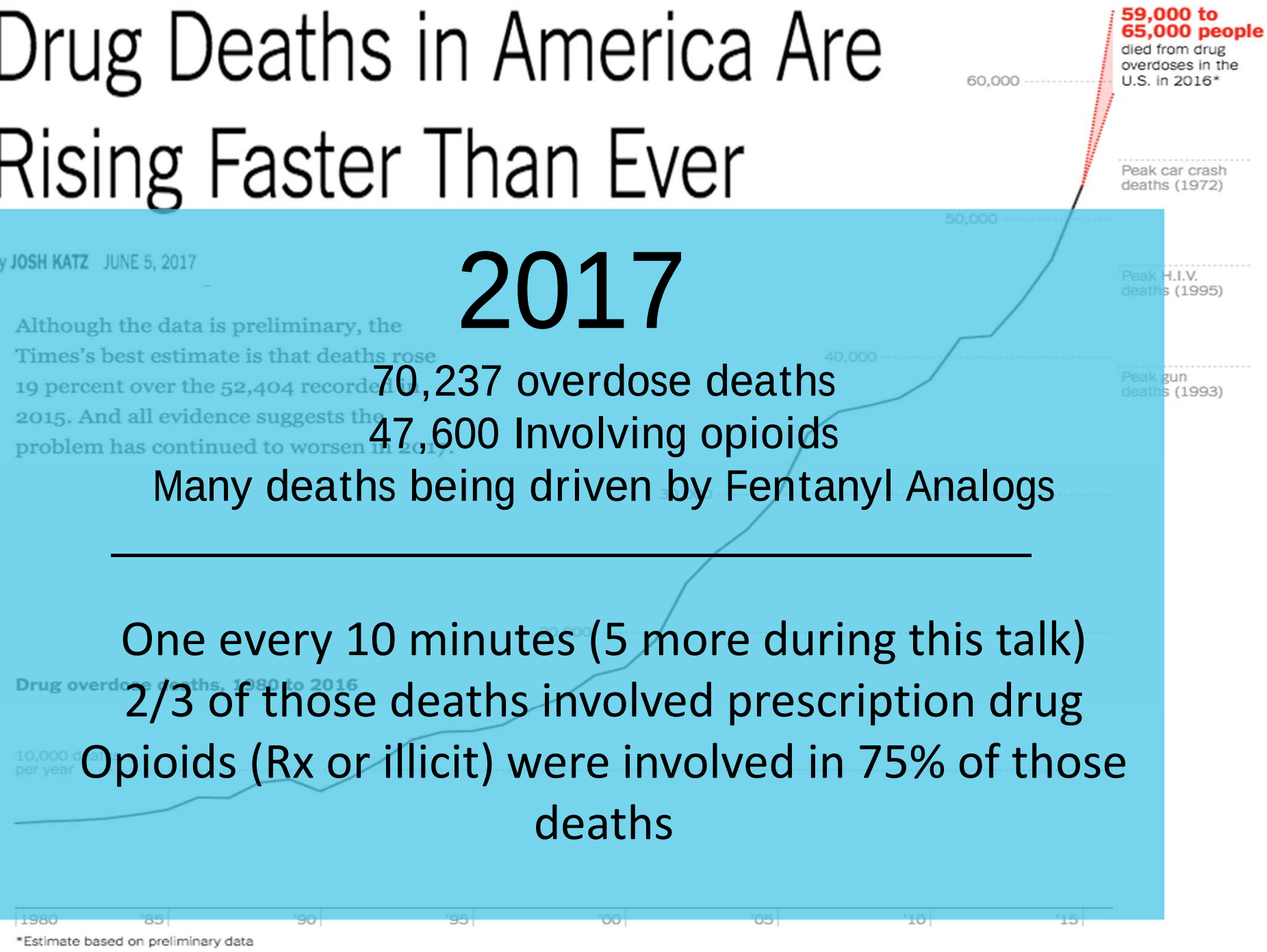
Drug Deaths in America Are Rising Faster Than Ever



By JOSH KATZ JUNE 5, 2017

Although the data is preliminary, the Times's best estimate is that deaths rose 19 percent over the 52,404 recorded in 2015. And all evidence suggests the problem has continued to worsen in 2017.

Drug overdose deaths, 1980 to 2016

10,000 deaths per year

2017

70,237 overdose deaths

47,600 Involving opioids

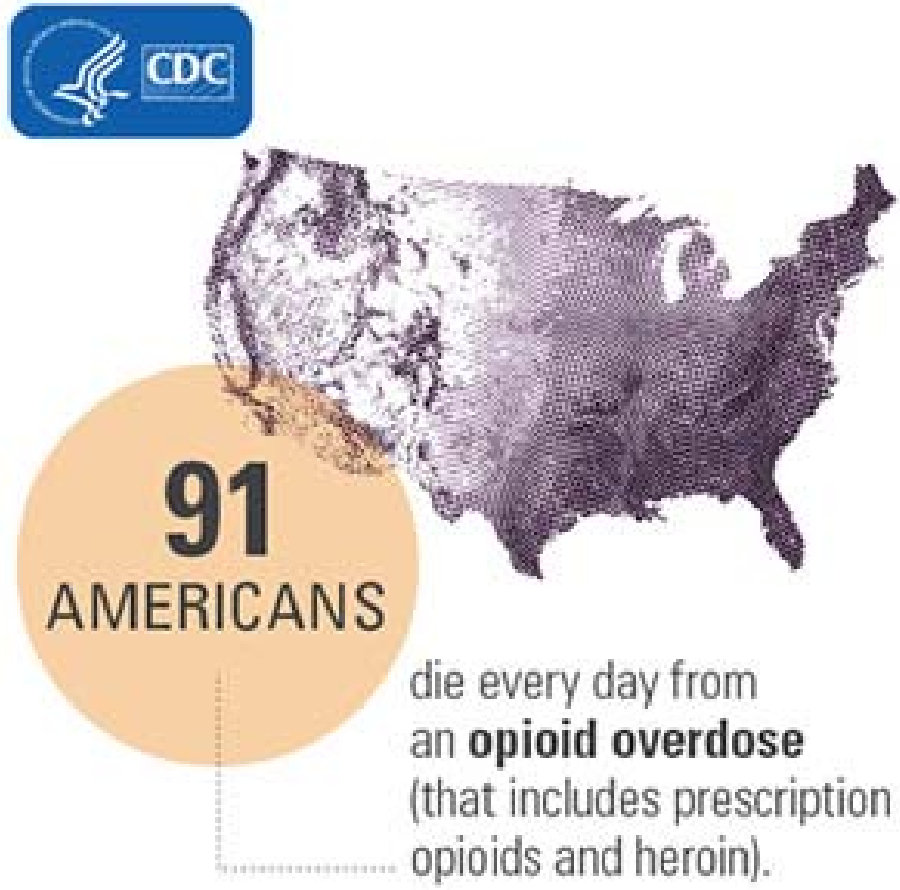
Many deaths being driven by Fentanyl Analogs

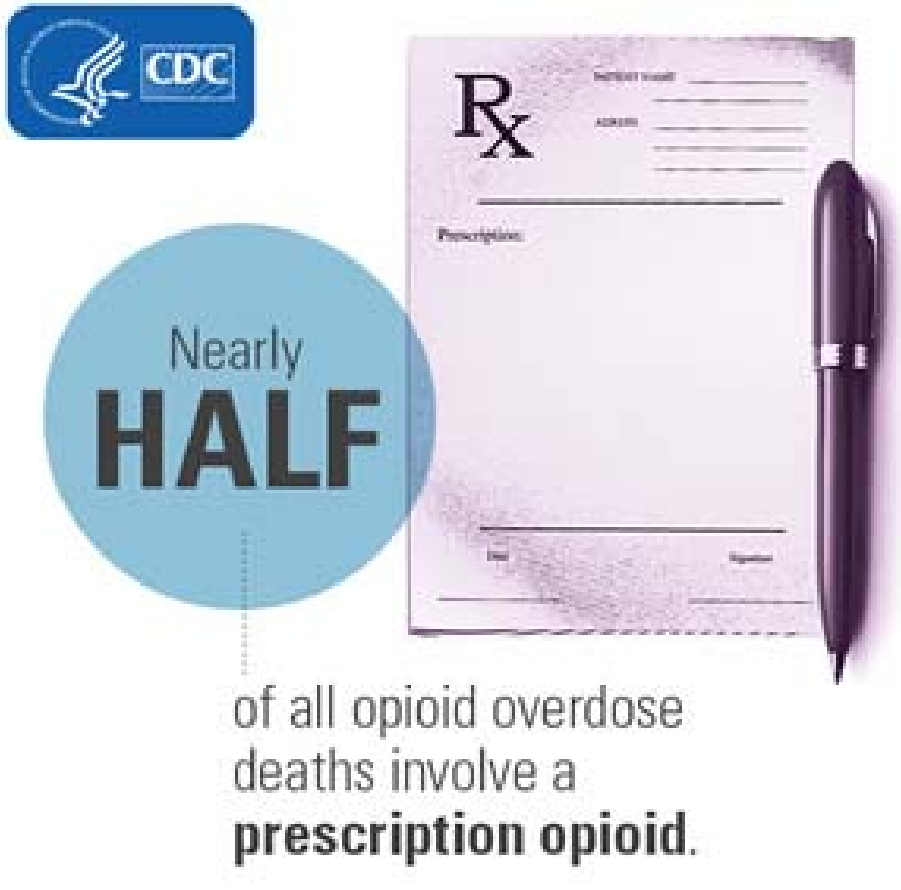
One every 10 minutes (5 more during this talk)

2/3 of those deaths involved prescription drug

Opioids (Rx or illicit) were involved in 75% of those deaths

Background


CDC
91
AMERICANS
die every day from
an **opioid overdose**
(that includes prescription
opioids and heroin).


CDC
Rx
Nearly
HALF
of all opioid overdose
deaths involve a
prescription opioid.

Background

- The United States has 10% of the world's population, yet we consume more than 80% of the world's opioids

- Why??

How did this happen?

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

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/day or less

Conclusion:

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

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

All patients have a right to pain control

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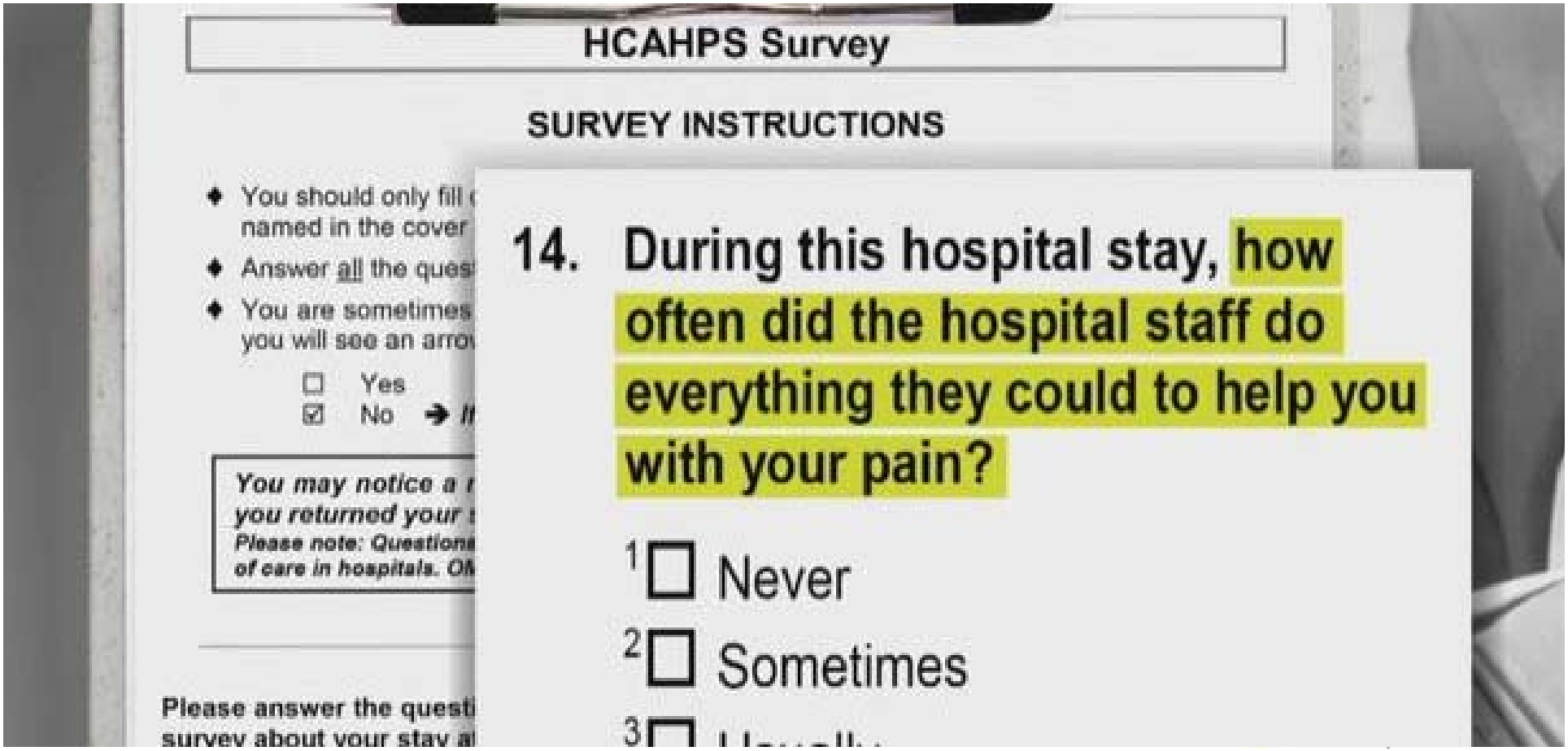
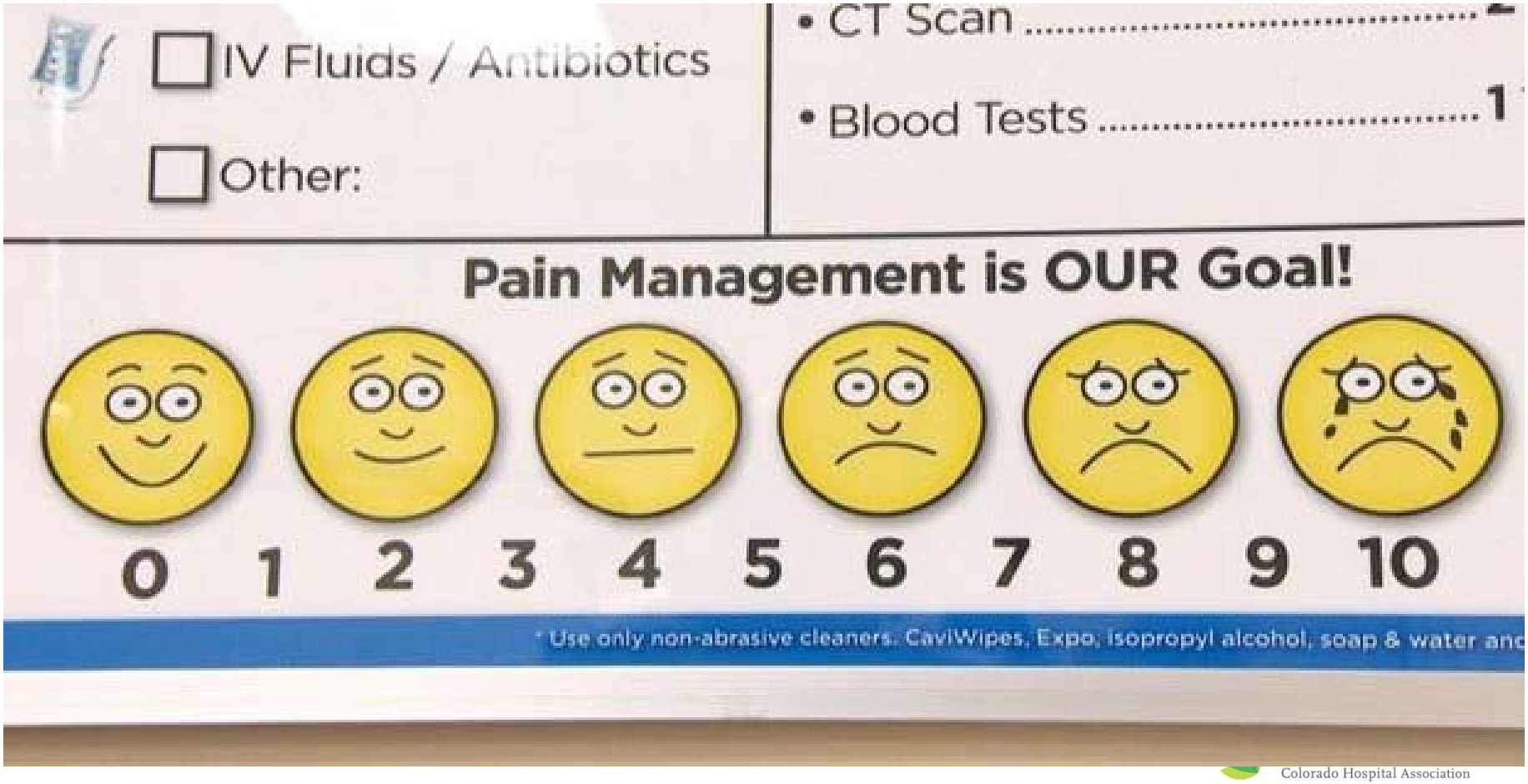
1999 Veterans Health Administration Memorandum: Pain as the Fifth Vital Sign. March 1, 1999..

HCAHPS Survey



Pain Scales


IV Fluids / Antibiotics
Other:
• CT Scan .....
• Blood Tests 1
Pain Management is OUR Goal!
0 1 2 3 4 5 6 7 8 9 10
* Use only non-abrasive cleaners. CaviWipes, Expo, isopropyl alcohol, soap & water and

Big Pharma

- **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

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

Pain = Opioid

- Pain is unacceptable
- Pain should be a 0/10
- All pain is the same
- All pain should be treated the same
- Pain = opioid
- Increasing pain = increasing opioid doses

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West Virginia

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Overdose Deaths

- WV has the highest age-adjusted rate of drug OD deaths involving opioids
- 2017 – 833 drug OD deaths
- Rate = 49.6 deaths per 100,000 persons
  - Double the rate in 2010
  - 3x > than the national rate of 14.6 deaths per 100,000 persons

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Overdose Deaths

- Sharpest increase in opioid-involved OD deaths was seen in cases involving synthetic opioids (mainly fentanyl)
  - 122 deaths in 2014 → 618 deaths in 2017
- Deaths involving heroin also increased
  - 163 → 244
- Prescription opioid-involved deaths decreased by 20%
  - 383 in 2014 → 304 in 2017

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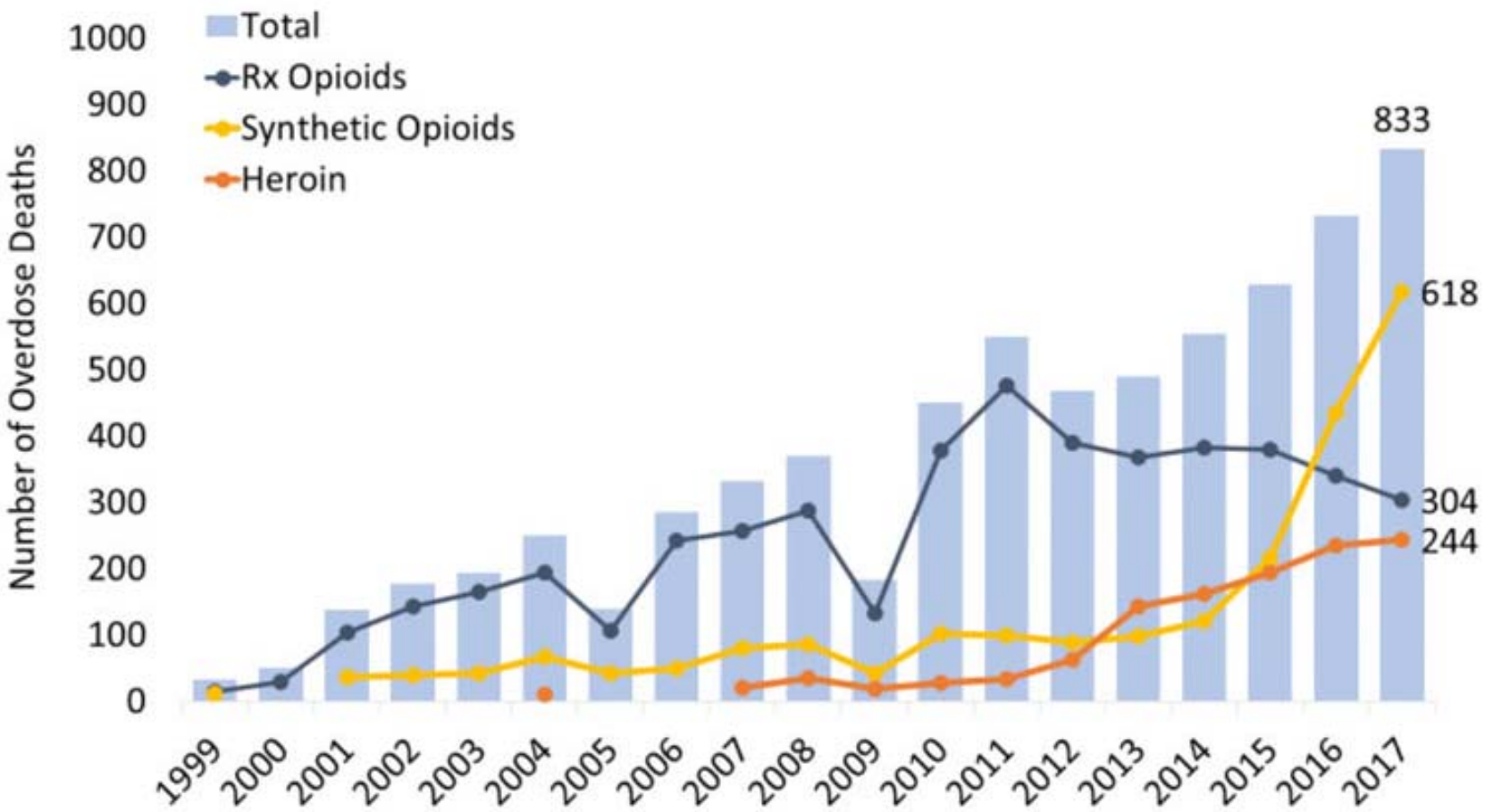
Overdose Deaths



CDC Wonder.

Opioid Prescribing

- In 2017, WV providers wrote 81.3 opioid prescriptions for every 100 persons
  - Compared to the average US rate of 58.7 prescriptions
  - Among top ten rates in US that year
  - Lowest rate in the state since data became available in 2006
- Age-adjusted rate of OD deaths involving opioid prescriptions has also followed a decreasing trend
  - Peak of 27.3 deaths per 100,000 in 2011 → 17.2 deaths per 100,000 in 2017

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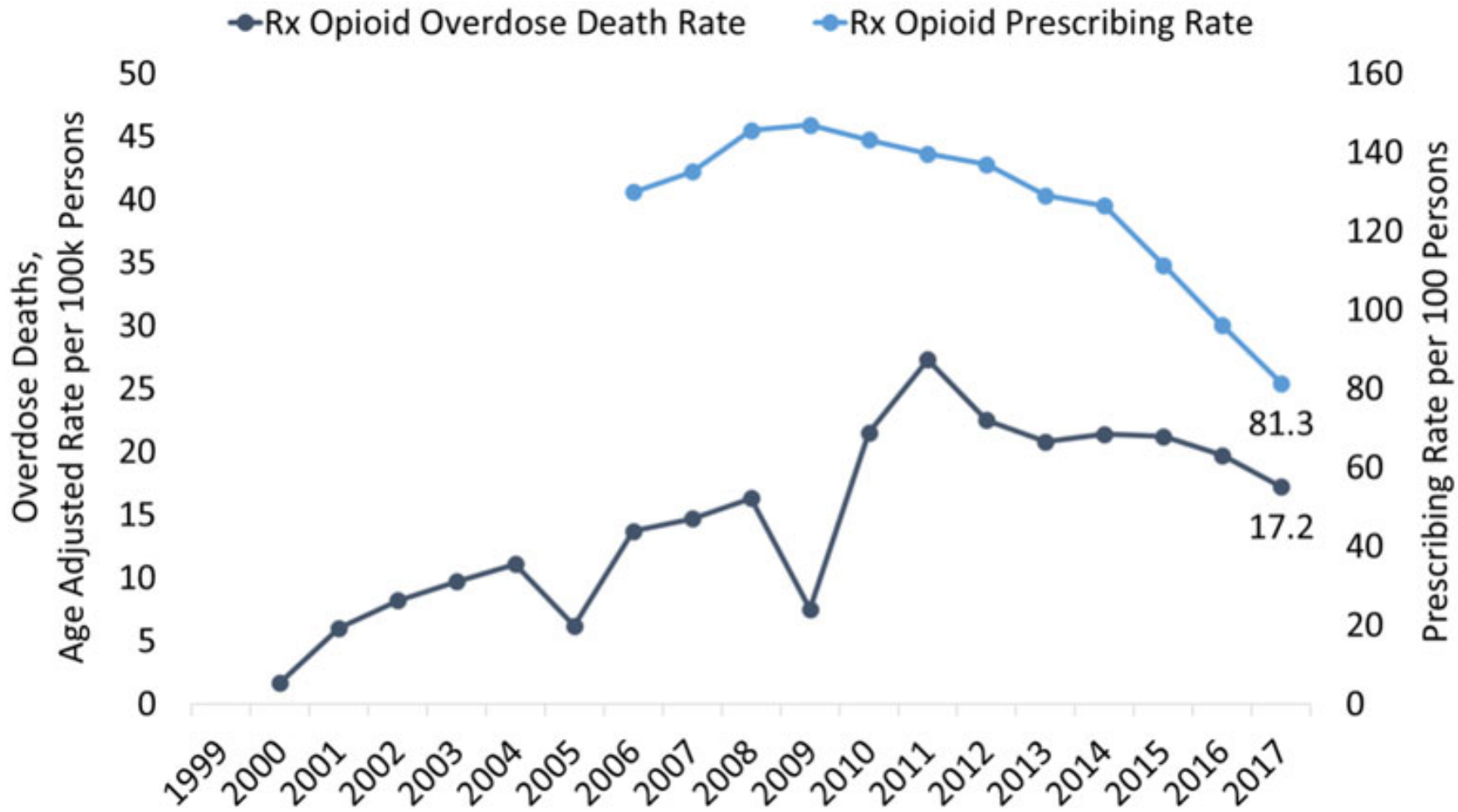
Opioid Prescribing



CDC Wonder.

NAS/NOWS

- In WV, the rate of neonatal abstinence syndrome (neonatal opioid withdrawal syndrome) NAS/NOWS cases doubled in a 3-yr period between 2011 and 2014
  - 25.2 cases → 51.2 cases per 100,000 hospital births
  - Highest rates in Marshall and Lincoln counties

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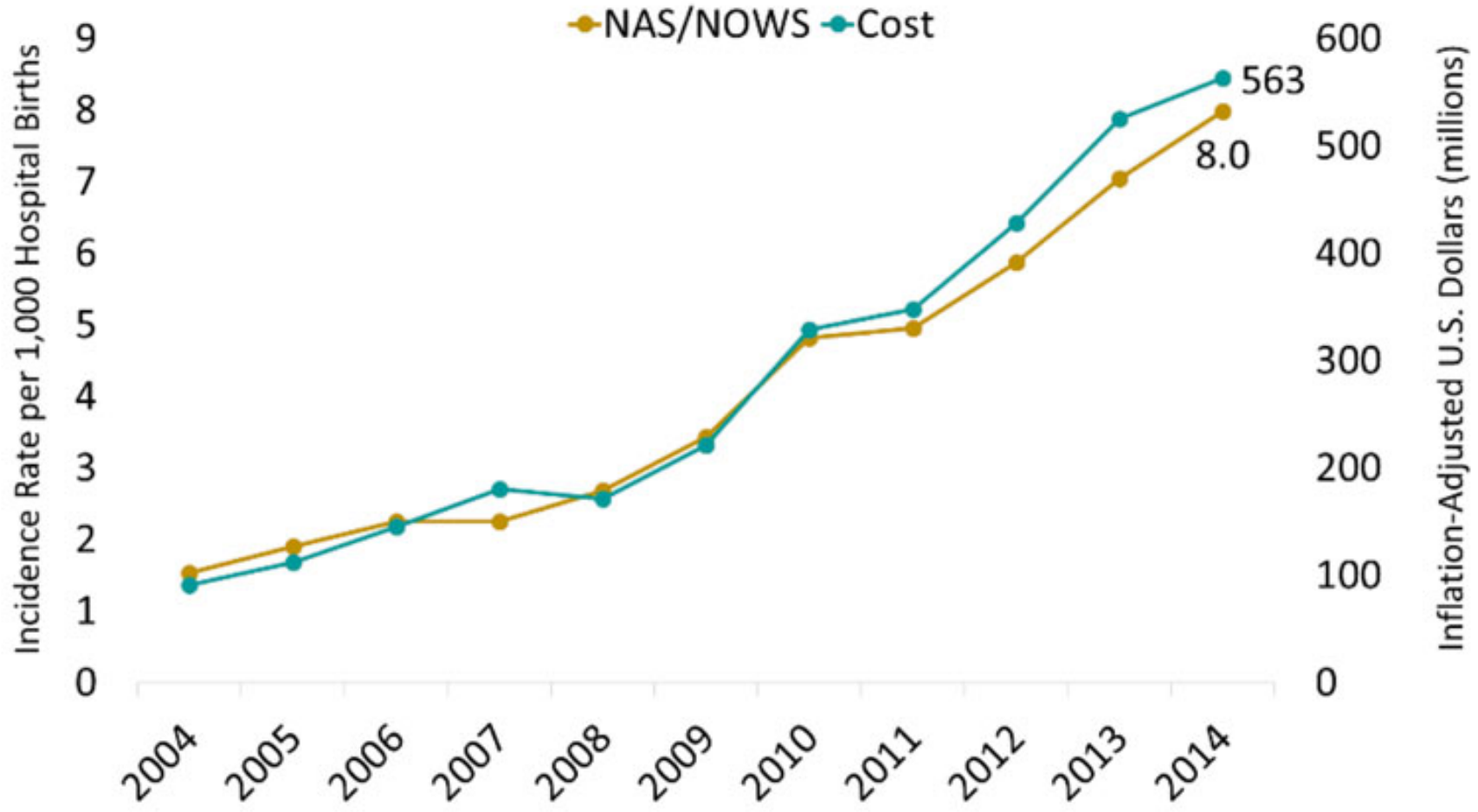
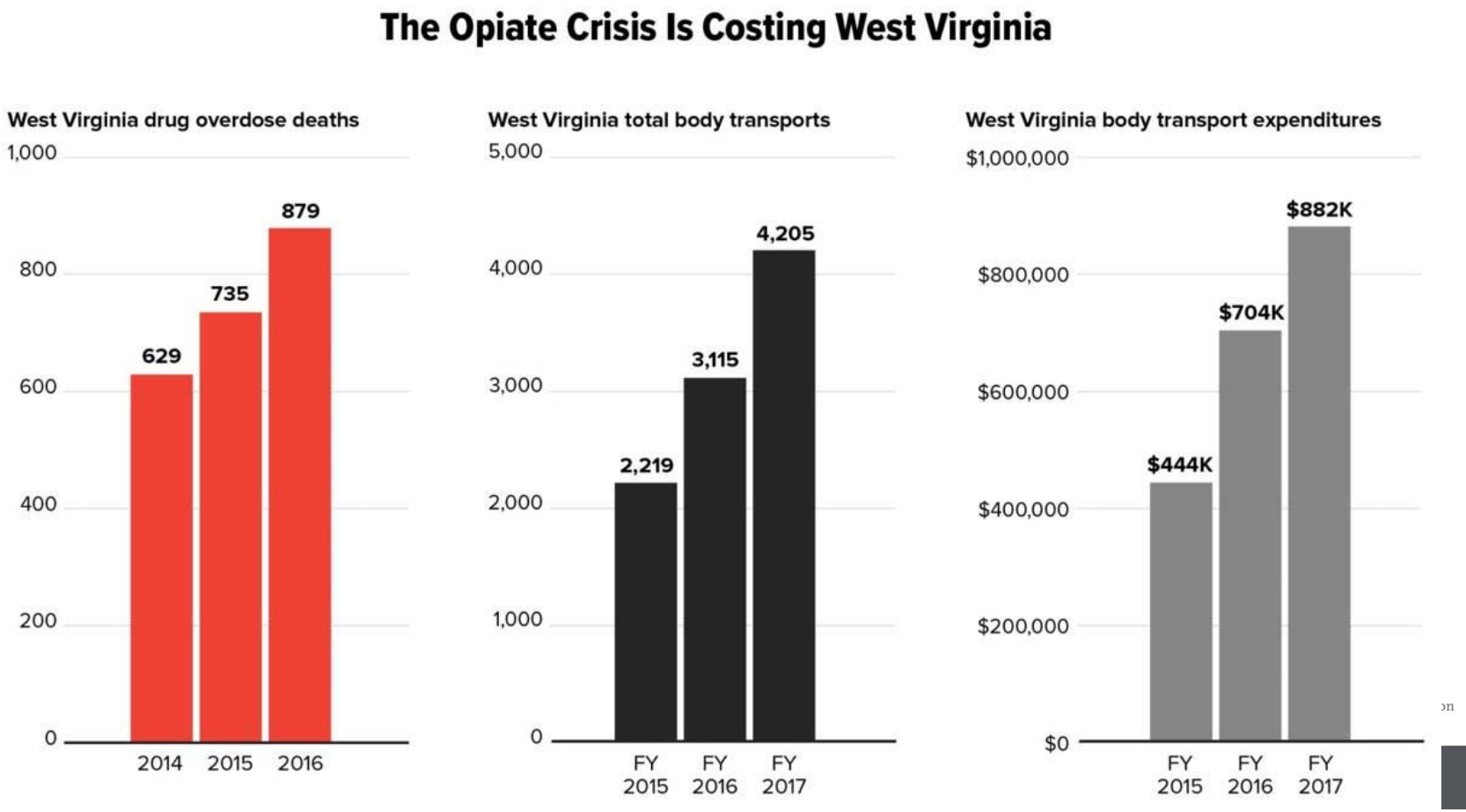
NAS/NOWS

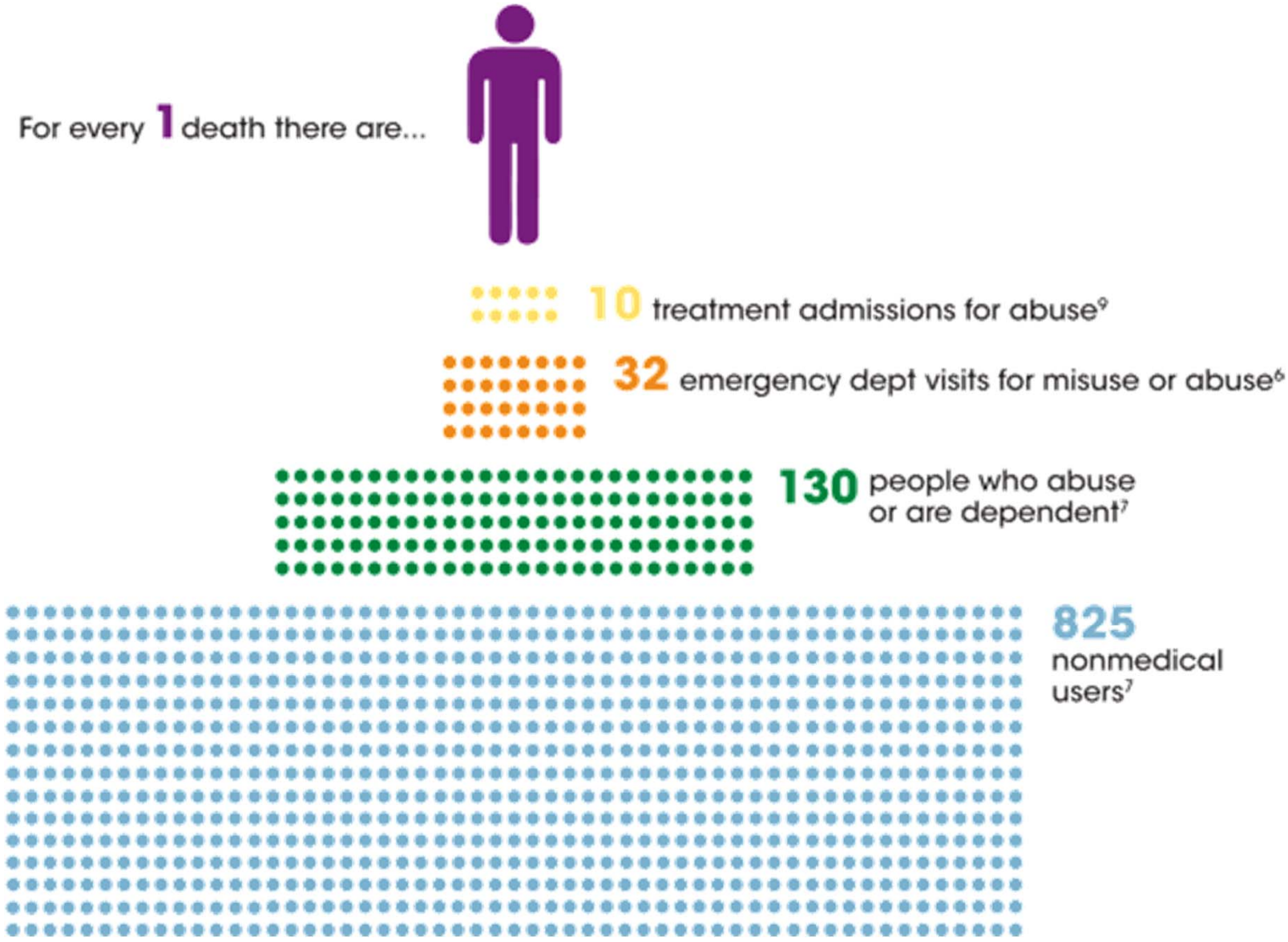


CDC Wonder.

Costs

- Opioid epidemic costs WV > $8 billion yearly
- WV has the highest economic burden = $4,793/person





What is the answer??

Colorado Consortium for Prescription Drug Abuse Prevention.

Alternatives to Opioids (ALTOs)

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ALTO Approach

- Multi-modal non-opiate approach to analgesia for specific conditions
- **Goals:** To utilize non-opiate approaches as first-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

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ALTO Pathways in the ED

- Pathways:
  - Kidney stones
  - Musculoskeletal pain
  - Open fractures/joint dislocation
  - Headache/migraine
  - Chronic abdominal pain

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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=combinations of non-opioid analgesics=less opioids
- Results in
  - Greater analgesia
  - Reduced doses of each medication
  - Fewer side effects
  - Shorter length of stay

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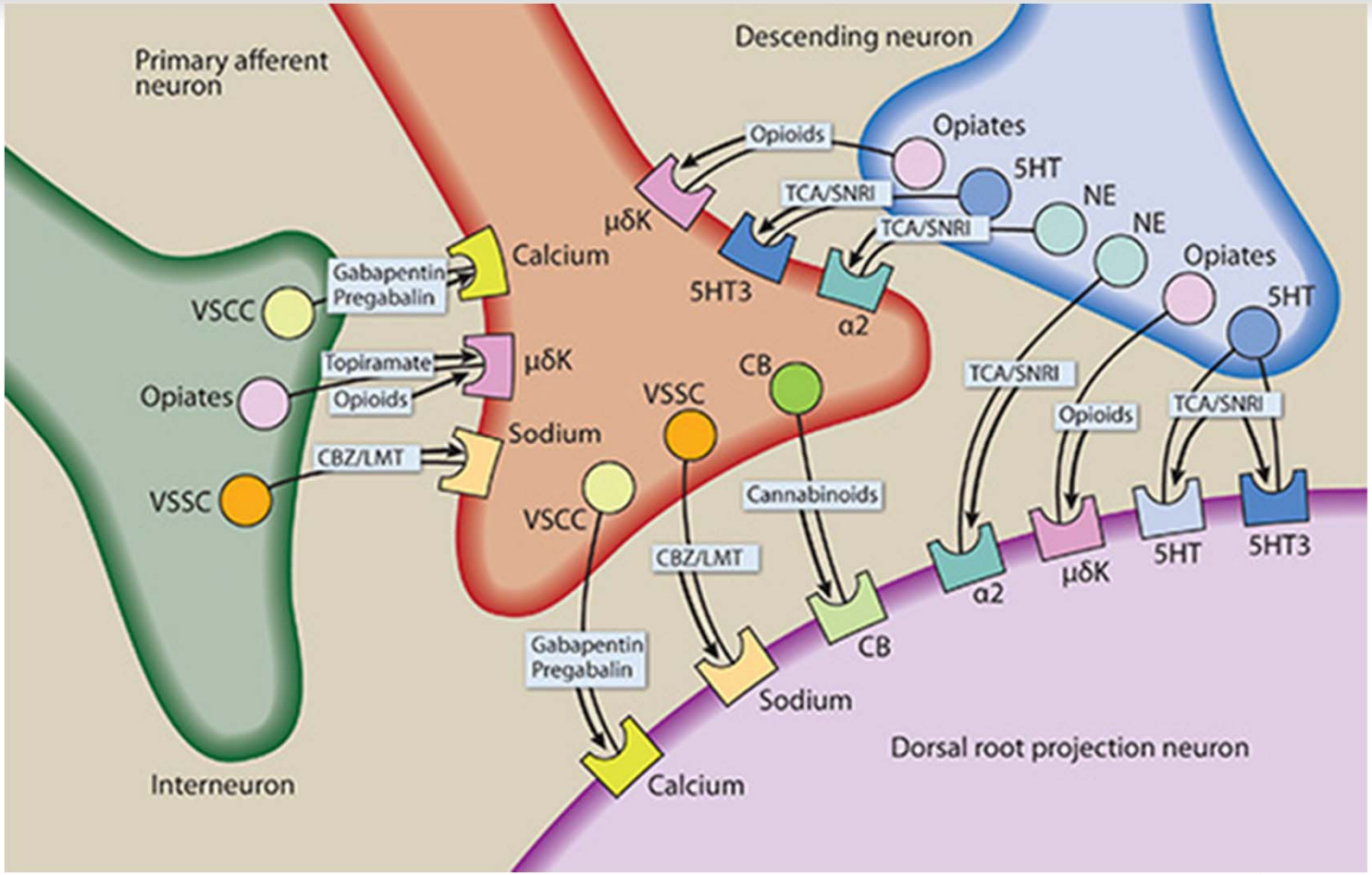
http://www.propofology.com/infographs/certa-concept-of-analgesia

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)

"Novel" ALTO Agents

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Lidocaine

- Acts on sodium channels and NMDA receptors
- Used **topically**, **intravenously** or as **trigger point injections**
- MSK, migraines, renal colic, abdominal, neuropathic

Lidocaine IV

- Lidocaine IV doses = 1.5 mg/kg over 10 min
  - Max 200 mg/dose
- Caution in patients with:
  - Arrhythmia
    - On anti-arrhythmic medications
  - Severe cardiac history
    - Hx of heart block
  - Severe hepatic disease

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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) 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) The median nausea free times in the lido vs NS group were 26 min vs 58 min (p<0.0001)

Lidocaine Topical

- Lidocaine topical patches
- Many different types of pain:
  - MSK pain
  - Ankle sprains
  - Lower back pain
  - Rib fractures
- Available in both 5% (prescription) vs 4% (OTC)
- Okay to leave on for 24 hrs if intact skin with no irritation

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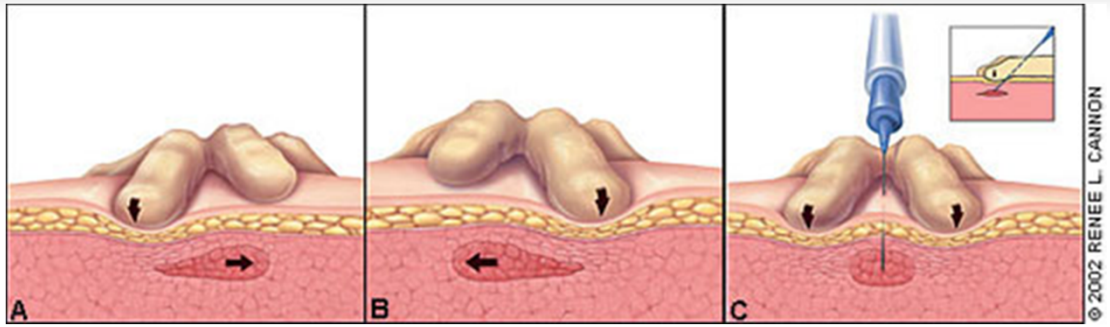
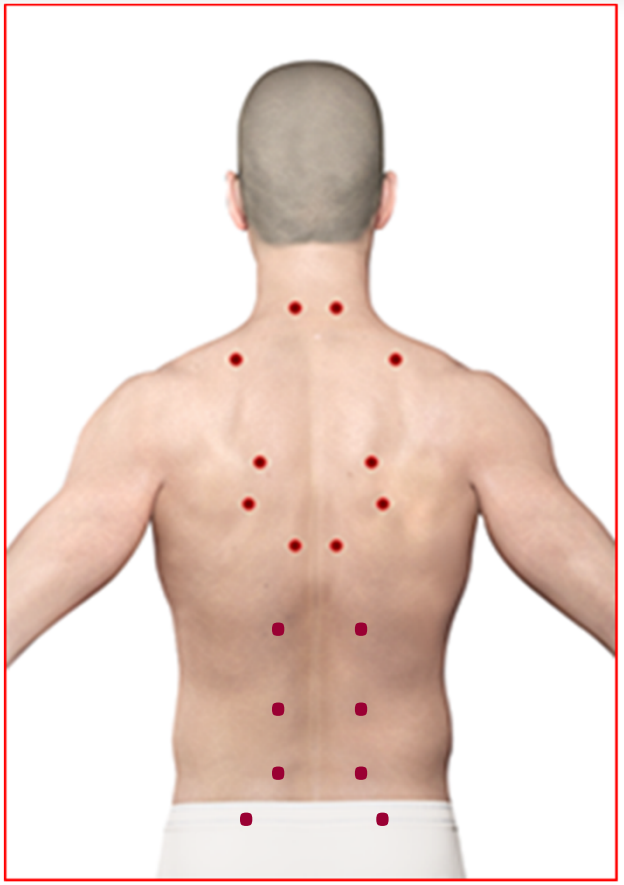
Trigger Point Injections



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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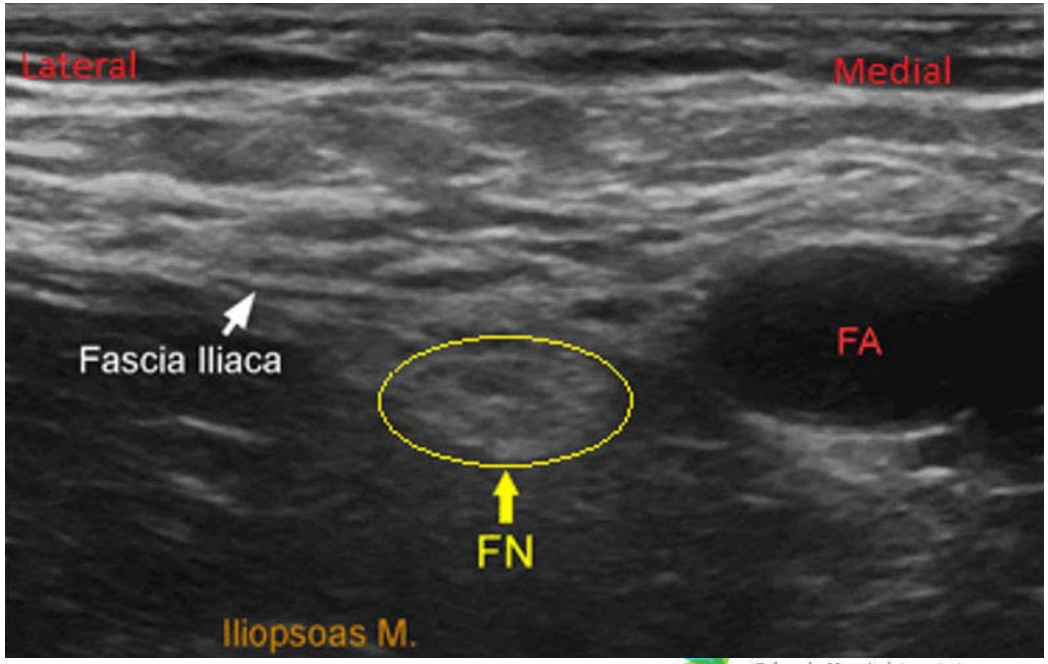
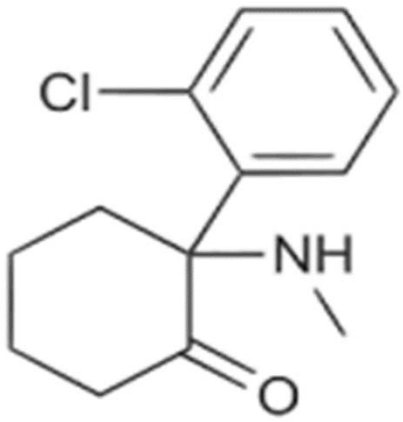
Nerve Blocks

- Ultrasound-guided regional anesthesia
  - Fascia iliaca - hip fractures
  - Femoral nerve
- Local anesthetics
  - Lidocaine
  - Bupivacaine
  - Ropivacaine
- Lipid-rescue



Ketamine

- Antagonizes NMDA receptors, among others
- Great in pediatrics
- Good in opioid tolerant patients
- Should not be used in patients with PTSD; caution in patients with head injury



Ketamine

- Can be used IV or IN, use is dose-dependent:
  - Analgesia = 0.2 mg/kg via slow IVP + 0.1 mg/kg/hr infusion
    - Compared to sedation dose = 1-2 mg/kg IV
  - 50 mg IN if no IV access
  - If patient experiences psychomimetic effects
    - Low-dose BZD

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) 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 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 At 15 and 30 min, no difference between groups

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Haloperidol

- Low dose (1-2.5 mg IV or PO)
- Great for nausea and abdominal pain
  - Cannabinoid hyperemesis syndrome
- Caution in patients with QT prolongation or on other QT prolonging medications – consider EKG if concerned
- Watch for EPS symptoms – diphenhydramine
- Olanzapine?

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Ketorolac

- 7.5-15 mg for everyone!
  - No difference in pain reduction with 7.5 mg vs 15 or 30 mg
- Great for many pain indications including MSK pain, renal colic, migraine
- Caution: Pregnancy, CV hx, renal dysfunction, AC/AP therapy, fracture healing, future OR

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Dicyclomine

- MOA: antispasmodic and anticholinergic agent that acts to alleviate smooth muscle spasms in the GI tract
- 20 mg/kg PO/IM (NOT IV!)
- Great for abdominal pain (think cramp
- Caution in elderly

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Other Options

- **Haloperidol/Ondansetron/Metoclopramide/Sumatriptan**
- **Gabapentin/Valproate**
  - 5HT1-4 and GABA receptors modulate pain in the spinal cord
- **DDAVP**
  - Synthetic vasopressin
- **Nitrous Oxide**
  - Effect is that of opioid and benzodiazepines
  - Safe, short acting
  - High potential for abuse

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APAP + Ibuprofen

- Multiple studies show that APAP + NSAID show superior pain relief than either agent alone
- APAP + NSAID has been found to more effective than oxycodone for post-op pain
  - NNT for 50% pain relief in patients vs oxy 1.6 vs 4.6
- NSAIDs found to be equally as efficacious as opioids at reducing pain associated with renal colic
  - Have less side effects

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ED Pain Treatment Pathways

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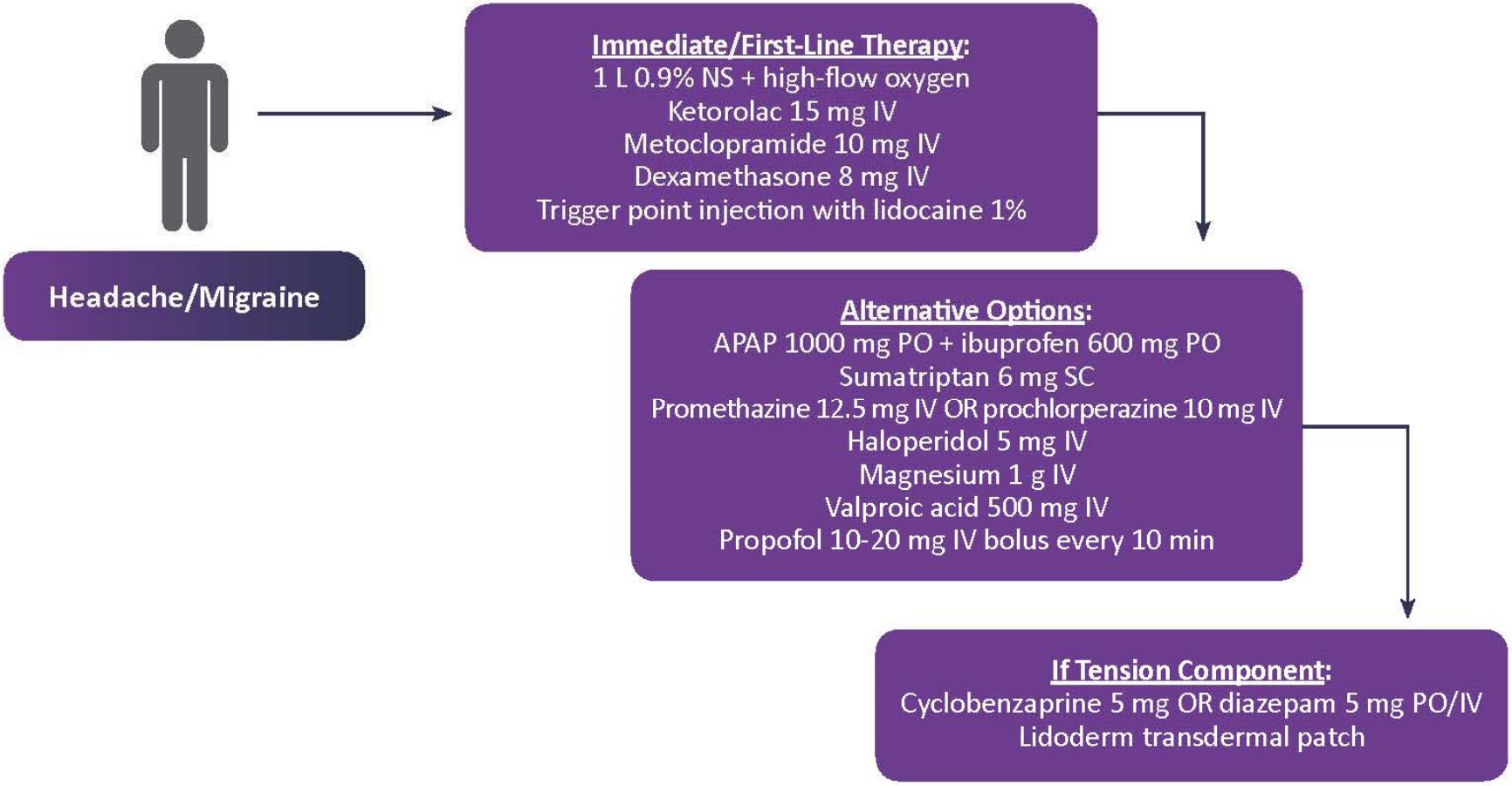
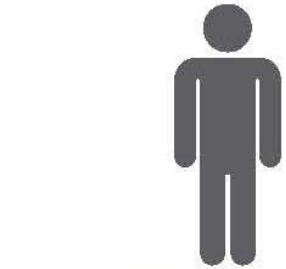
Headache/Migraine



Musculoskeletal Pain



Musculoskeletal Pain

Non-IV Therapies:
APAP 1000 mg PO + ibuprofen 600 mg PO
Cyclobenzaprine 5 mg PO OR diazepam 5 mg PO
Gabapentin 300 mg PO
Lidoderm patch (max 3 patches)
Ketamine 50 mg IN
Trigger point injections with lidocaine 1%

IV Therapy 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

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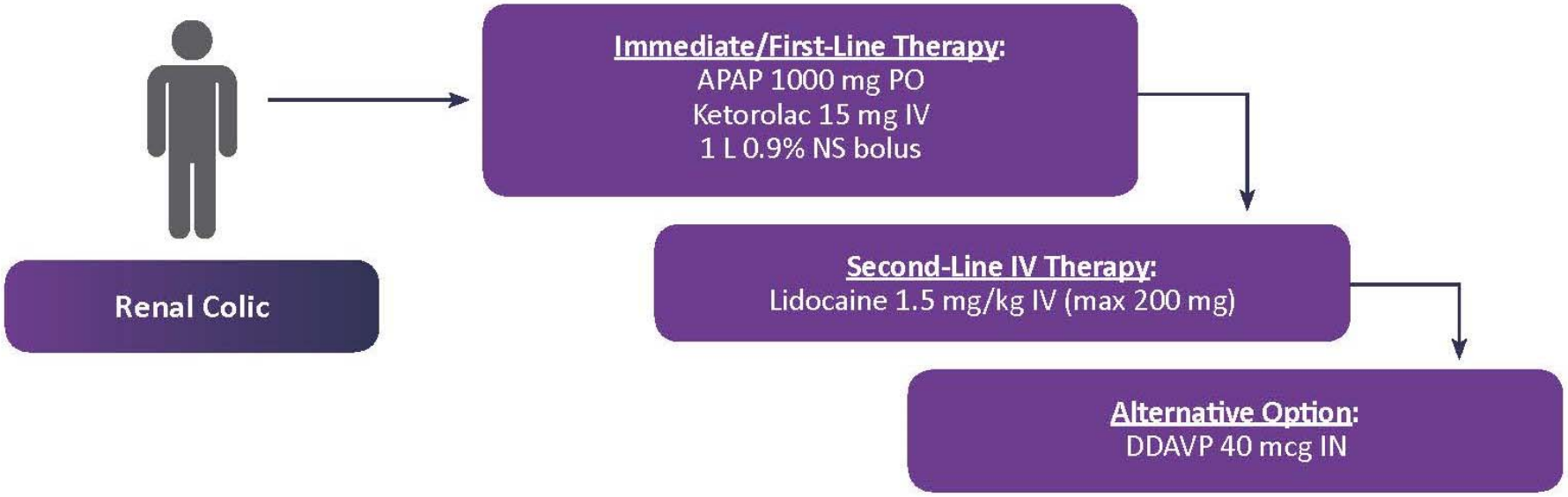
Renal Colic



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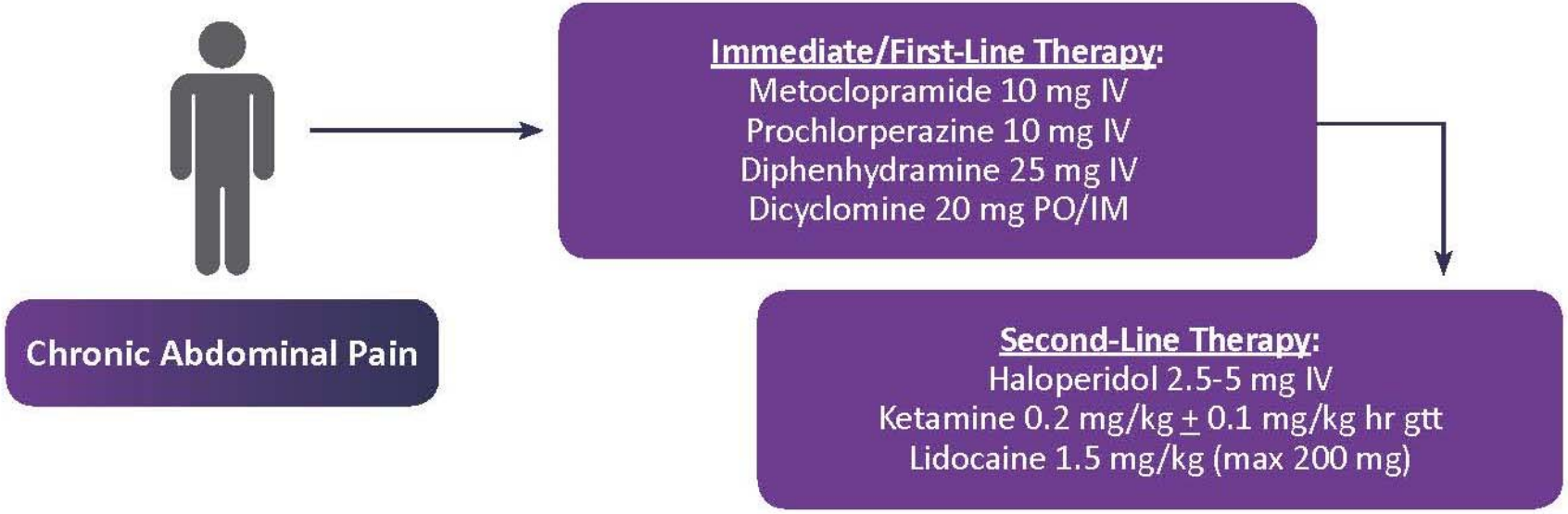
Chronic Abdominal Pain



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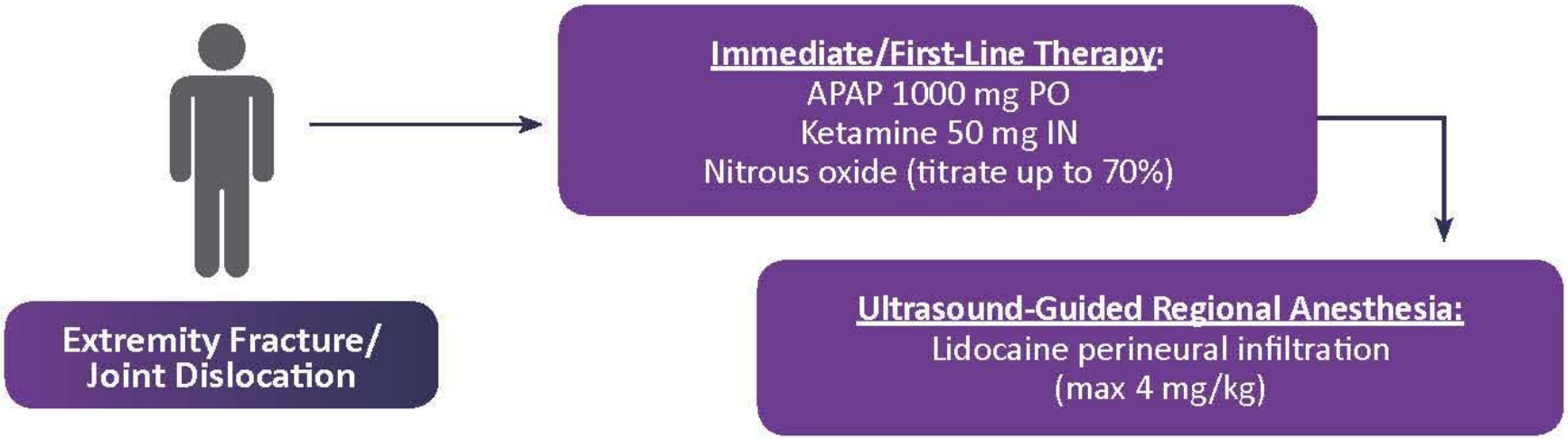
Extremity Fracture/Joint Dislocation



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Cases

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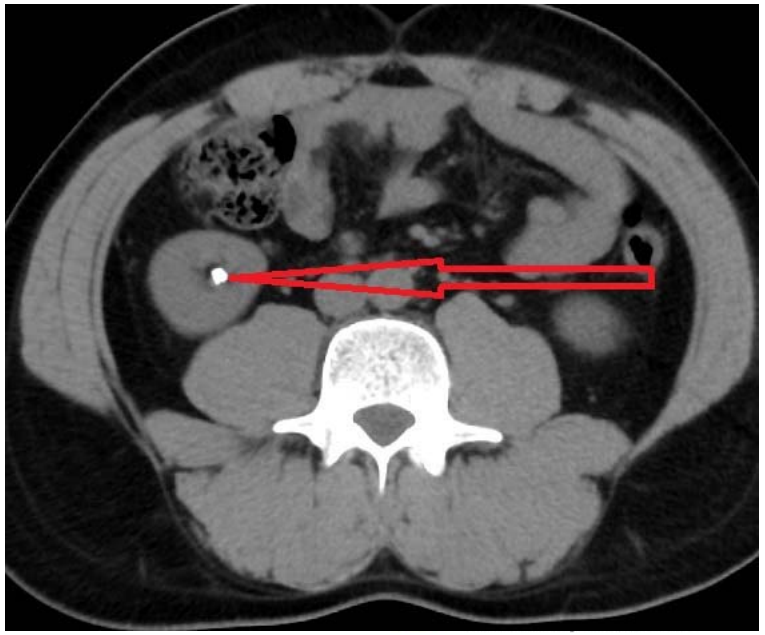
Case #1

- 32 yom presents to the ED with cc of flank pain
- Only PMH significant for recurrent kidney stones
- Patient describes stabbing pain coming in waves, originating in lower R flank, radiating to groin
- Initial Management:
  - 1 L IVF
  - 1 g APAP
  - Ketorolac 10 mg IV

Case #1 continued

- CT scan shows 7 mm stone moving into the ureter
- Patient states overall pain improved but still uncomfortable
- Treatment:
  - Lidocaine 1.5 mg/kg over 10 min
  - 1 L IVF



Case #1 continued

- While overall pain is much improved, patient still having extreme pain thought to be related to ureter spasms around the stone
- Treatment:
  - DDAVP 40 mcg IN
- Patient admitted for pain control and scheduled for ureteroscopy

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Case #2

- 47 yof presents with cc of abdominal pain
- PMH chronic functional abdominal pain, anxiety
- Patient on a care plan – “no narcotics”
- Describes as constant, shooting pain originating in lower abdomen, crampy in nature, not improved with repositioning
- Already tried ondansetron 4 mg SL + diphenhydramine 25 mg PO prior to arrival

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Case #2 continued

- Treatment:
  - Dicyclomine 20 mg IM
- Patient describes mild improvement, but still in significant discomfort
- Treatment:
  - Haloperidol 2.5 mg IV
- Patient describes significant improvement
- Discharged: Olanzapine 2.5 mg PO Q 12 h PRN N/V

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Questions?

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