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### Implementation of non-opioid order panels in Parkview Health emergency departments

Brandon James Euen

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# Implementation of Non-Opioid Order Panels in Parkview Health Emergency Departments

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The speaker has no actual or potential conflict of interest in relation to this presentation  
The following study was approved by the Parkview Health IRB



# Background

- In 2018, 130 people per day died in the United States from opioid overdoses<sup>1</sup>
- One analysis of opioid abusers reported that 75% of participants stated their first abused opioid was a prescription drug<sup>2</sup>
- Acute pain is often encountered in the emergency department (ED), requiring rapid action to achieve pain control<sup>3</sup>

1. CDC/NCHS, National Vital Statistics System. Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2018

2. Cicero TJ, Ellis MS, Surratt HL, Kurtz SP. The changing face of heroin use in the United States: a retrospective analysis of the past 50 years. *JAMA Psychiatry*

3. Axeen S., Seabury S.A., Menchine M Emergency Department Contribution to the Prescription Opioid Epidemic. (2018) *Annals of Emergency Medicine*.

# Panel Benefits

- Non-opioid order panels support the 2017 American College of Emergency Physicians (ACEP) statement on treatment of acute pain in the ED setting<sup>4</sup>
  - “Pharmacologic treatment of many acutely painful conditions should optimally begin with a non-opioid agent.”
- Order panels can:
  - Reduce time placing orders
  - Facilitate combination orders
  - Standardize orders
  - Help meet EQUAL improvement requirements<sup>5</sup>



4. Optimizing the Treatment of Acute Pain in the Emergency Department. *Annals of Emergency Medicine*

5. 2017 Opioid Prescribing and Treatment Guidelines: Confronting the Opioid Epidemic in Colorado's Emergency Departments. *Colorado ACEP*

# E-QUAL Involvement

- E-QUAL: Emergency Quality Network<sup>6</sup>
  - ACEP lead initiative geared towards quality improvement
  - Tied to MIPS (merit-based incentive payment system)
- Methods to improve MIPS score include implementation of improvement activities
  - “Implementation of formal practice improvement processes”
  - “Use of evidence-based aids for shared decision making”



Reducing Opioid-Associated Harm  
through safer prescribing and the implementation  
of evidence-based interventions



# Self-Assessment Question #1

Which of the following recommendations is found in the American College of Emergency Physicians 2017 policy statement on treatment of acute pain in the ED setting?

- A.** The use of opioid medications in the emergency department is rarely appropriate
- B.** Pharmacologic treatment of many acutely painful conditions should optimally begin with a non-opioid agent
- C.** Non-pharmacologic treatments for pain are generally ineffective and should be avoided in the emergent setting
- D.** When initiating treatment with opioids, extended-release or long-acting agents are preferred

# Self-Assessment Question #1

Which of the following recommendations is found in the American College of Emergency Physicians 2017 policy statement on treatment of acute pain in the ED setting?

- A. The use of opioid medications in the emergency department is rarely appropriate
- B. Pharmacologic treatment of many acutely painful conditions should optimally begin with a non-opioid agent**
- C. Non-pharmacologic treatments for pain are generally ineffective and should be avoided in the emergent setting
- D. When initiating treatment with opioids, extended-release or long-acting agents are preferred

# Self-Assessment Question #2

Which of the following is a potential benefit of non-opioid order panel implementation?

- A. Total elimination of severe, acute pain is often achieved through panel use
- B. Pharmacy involvement in the emergency department setting is minimized
- C. The need for non-pharmacologic pain control interventions is removed
- D. Order panels can facilitate the ordering of non-opioid pain medication combinations



# Self-Assessment Question #2

Which of the following is a potential benefit of non-opioid order panel implementation?

- A. Total elimination of severe, acute pain is often achieved through panel use
- B. Pharmacy involvement in the emergency department setting is minimized
- C. The need for non-pharmacologic pain control interventions is removed
- D. Order panels can facilitate the ordering of non-opioid pain medication combinations**

# Parkview Health

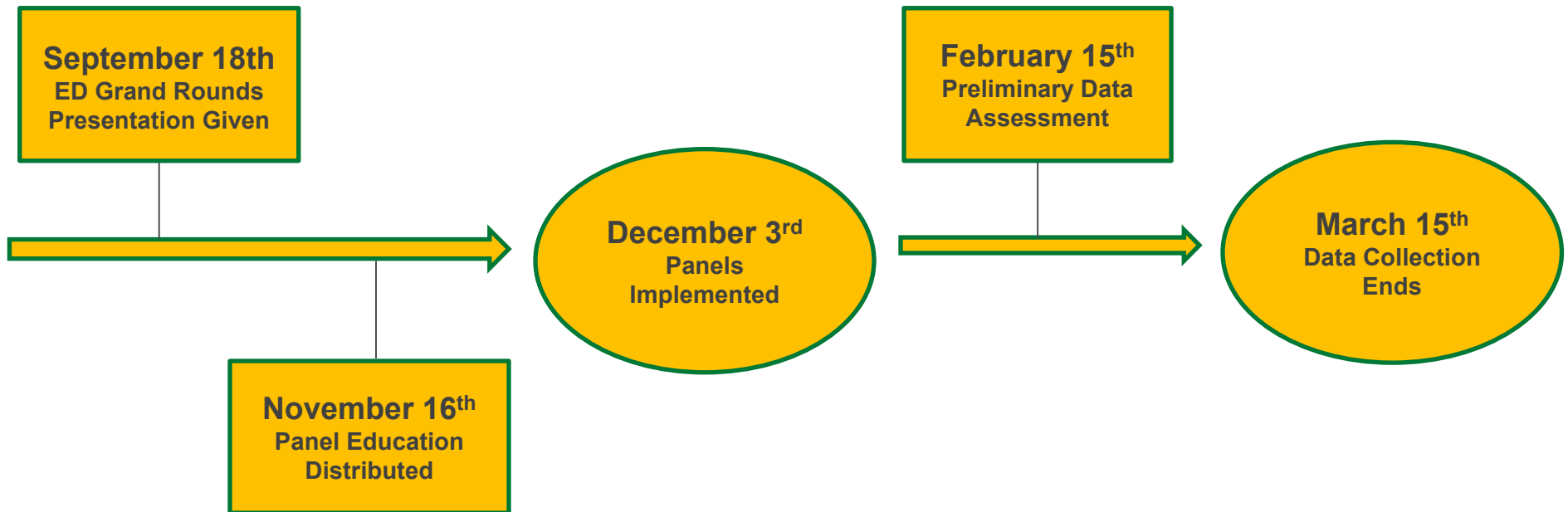
- Fort Wayne, Indiana
  - 8 hospital health system
  - Study takes place at Parkview Regional Medical Center (PRMC) and Parkview Hospital Randallia (PVR)
- PRMC: 400 beds
  - Level II Trauma Center
  - 5 ICUs
  - 65,332 ED patients in 2018
- PVR: 174 beds
  - Medical ICU
  - 57,800 ED patients in 2018



# Purpose

- To implement non-opioid order panels for use in Parkview Health emergency departments
- Overall, implementation of non-opioid order panels may help optimize opioid prescribing in Parkview Health EDs

# Timeline



# Panel Education

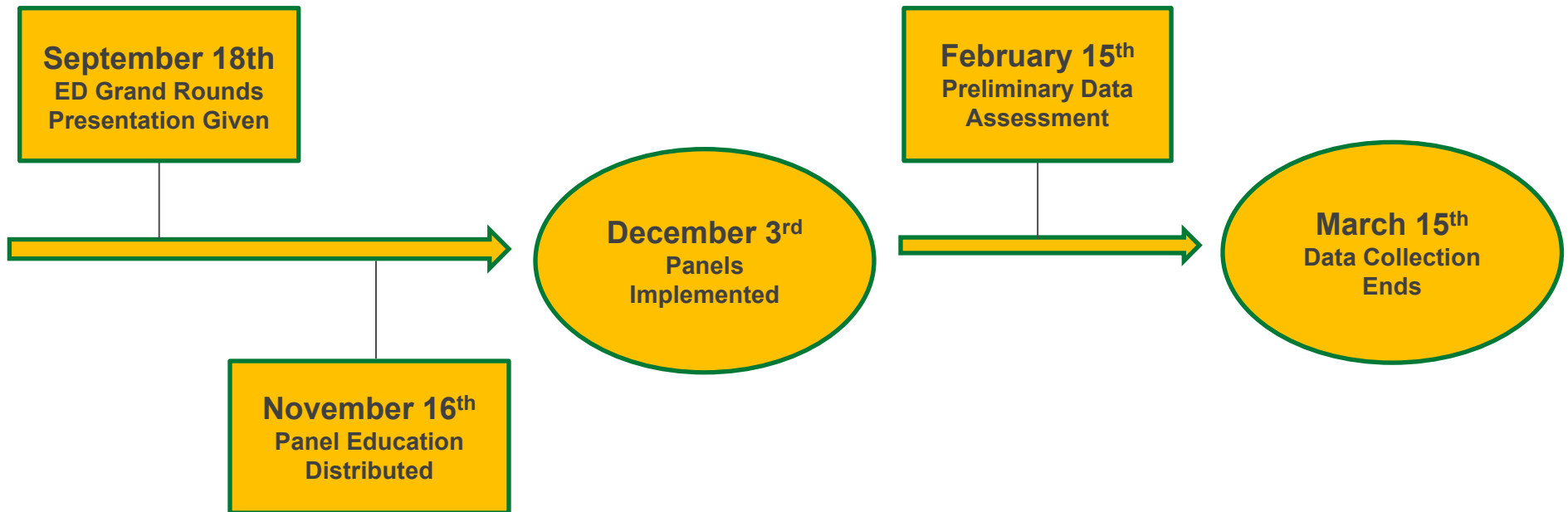
- Handout-format document including dosing and safety information on panel medications
  - Highlighted therapy combinations
  - Included panel release dates and locations

## IV Lidocaine<sup>4,5</sup>

Default dose: 1.5 mg/kg IV once infused over 15 minutes

- Preliminary evidence shows lidocaine may be used to control renal colic, abdominal pain, and some neuropathic pains.
- All patients receiving IV lidocaine will be required to have cardiac monitoring.
- IV lidocaine should be avoided in patients presenting with or with a history of cardiac arrhythmias, heart failure, heart block, MI, or seizures
- Adverse effects include numbness and tingling, lightheadedness, dizziness
  - Tinnitus, confusion, seizure, and cardiac arrhythmias have also been reported and signal possible toxicity.
- Maximum dose is 200 mg IV once.

# Timeline



# ED Quicklist

**Manage Orders**

[Quick List](#) [Active](#) [Signed & Held](#) [Home Meds](#) [Cosign](#) [Order History](#) [Recurring Treatment](#)

**Order Sets**

Suggested (2) [ED Courtesy Admission](#) [GEN Adult Primary Care Daily Rounding](#)

[01-Quick Orders](#) [02-Imaging](#) [03-Labs](#) [04-Medications](#) [05-Abd Pain](#) [06-Allergic Reaction](#) [07-Behavioral Health/Restraints](#) [08-Blood Admin](#) [09-Chest Pain/AC](#)  
[11-Sepsis](#) [12-Stroke](#) [13-Pediatric](#)

**ED Med Panels**

- ED Atraumatic Headache Pain Panel
- ED Non-Opioid Pain Panel
- ED ENT box
- ED Eye Tray

**Common Meds**

- acetaminophen (TYLENOL) suspension
- acetaminophen (TYLENOL) tablet
- aspirin chewable tablet
- bacitracin zinc ointment
- calcium chloride 100 mg/mL (10 %) syringe
- cloZAPine (CLOZARIL) tablet
- diazepam (VALIUM) 5 mg/mL syringe
- dextrose 50% in water (D50W) syringe
- diphenhydrAMINE (BENADRYL) capsule
- diphenhydrAMINE (BENADRYL) injection
- diphenoxylate-atropine (LOMOTIL) 2.5-0.025 mg tablet

**Common Meds**

- lidocaine \*PF\* (XYLOCAINE) 10 mg/mL (1 %) injection (2ml Vial)
- lidocaine (XYLOCAINE) 10 mg/mL (1 %) injection (20ml vial)
- LORazepam (ATIVAN) injection
- meperidine (DEMEROL) injection
- methylPREDNISolone (Solu-MEDROL) IV
- methylPREDNISolone (Solu-MEDROL) IV
- morphine injection
- nalBUPHine (NUBAIN) injection
- nitroglycerin (NITROSTAT) SL tablet
- nitroglycerin (NITROSTAT) 2 % ointment
- norgestrel-ethinyl estradiol (LO/OVRAL) tablet
- ondansetron \*PF\* (ZOFRAN) 4 mg/2 mL injection
- ondansetron (ZOFRAN-ODT) disintegrating tablet 4 mg
- ondansetron (ZOFRAN-ODT) disintegrating tablet 8 mg

**IV Fluids**

- ED IV Fluids
- ED Bolus with NS Maintenance Fluids (250ml bolus)
- ED Bolus with NS Maintenance Fluids (500ml bolus)
- ED Bolus with NS Maintenance Fluids (1000ml bolus)
- IV NS Bolus
- Intoxication Treatment (Banana Bag)

**Critical Care**

- amiodarone (CORDARONE) bolus and infusion
- atropine 0.1 mg/mL syringe
- diltiazem (CARDIZEM) bolus and infusion
- DOBUTamine (DOBUTREX) infusion
- DOPamine (INTROPIN) infusion
- enoxaparin (LOVENOX) injection
- EPINEPHrine (ADRENALIN) injection (1:1000)
- EPINEPHrine (ADRENALIN) 0.1 mg/mL

# ED Quicklist

**Manage Orders**

Quick List Active Signed & Held Home Meds Cosign Order History Recurring Treatment

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- EPINEPHrine (ADRENALIN) injection (1:1000)
- EPINEPHrine (ADRENALIN) 0.1 mg/mL





# ED Non-Opioid Pain Panel

ED Non-Opioid Pain Panel		✓ Accept
<input type="checkbox"/>	acetaminophen (TYLENOL) tablet 1,000 mg, Oral, Every 6 hours, Starting 3/1/19	
<input type="checkbox"/>	ibuprofen (ADVIL,MOTRIN) tablet 400 mg, Oral, Every 6 hours, Starting 3/1/19	
<input type="checkbox"/>	ketorolac (TORADOL) injection 15 mg, Intravenous Push, Every 6 hours, Starting 3/1/19	
<input type="checkbox"/>	dicyclomine (BENTYL) capsule 20 mg, Every 6 hours, Starting 3/1/19	
<input type="checkbox"/>	dicyclomine (BENTYL) injection 20 mg, Intramuscular, Every 6 hours, Starting 3/1/19	
<input type="checkbox"/>	orphenadrine (NORFLEX) 12 hr tablet 100 mg, Oral, Every 12 hours, Starting 3/1/19	
<input type="checkbox"/>	orphenadrine (NORFLEX) injection 60 mg, Intravenous Push, Once, Starting 3/1/19	
<input type="checkbox"/>	cyclobenzaprine (FLEXERIL) tablet 10 mg, Oral, Every 8 hours, Starting 3/1/19	
<input type="checkbox"/>	lidocaine *PF* (XYLOCAINE) pain infusion 1.5 mg/kg 1.5 mg/kg, Intravenous, Once, Starting 3/1/19, Cardiac monitoring required.	
<input type="checkbox"/>	lidocaine (ASPERCREME) 4 % 1 patch, Transdermal, Every 24 hours, Starting 3/1/19	
<input type="checkbox"/>	haloperidol lactate (HALDOL) injection 2 mg, Intravenous Push, Once, Starting 3/1/19	

Next Required

✓ Accept

# ED Atraumatic Headache Panel

ED Atraumatic Headache Panel		✓ Accept
<input type="checkbox"/>	acetaminophen (TYLENOL) tablet 1,000 mg, Oral, Every 6 hours, Starting 3/4/19	
<input type="checkbox"/>	ibuprofen (ADVIL,MOTRIN) tablet 400 mg, Oral, Every 6 hours, Starting 3/4/19	
<input type="checkbox"/>	ketorolac (TORADOL) injection 15 mg, Intravenous Push, Once, Starting 3/4/19	
<input type="checkbox"/>	diphenhydramine (BENADRYL) injection 25 mg, Intravenous Push, Once, Starting 3/4/19	
<input type="checkbox"/>	metoclopramide (REGLAN) injection 10 mg, Intravenous Push, Once, Starting 3/4/19	
<input type="checkbox"/>	prochlorperazine (COMPAZINE) injection 10 mg, Intramuscular, Once, Starting 3/4/19	
<input type="checkbox"/>	dexamethasone (DECADRON) injection 8 mg, Intravenous Push, Once, Starting 3/4/19	
<input type="checkbox"/>	magnesium sulfate IVPB 1 g, Intravenous, Administer over 1 Hours, Once, Starting 3/4/19	
<input type="checkbox"/>	rizatriptan (MAXALT) tablet 10 mg, Oral, Once, Starting 3/4/19, Avoid use within 24 hours of dihydroergotamine administration. Repeat after 2 hours if significant relief is not attained.	
<input type="checkbox"/>	SUMATriptan (IMITREX) injection 6 mg, Subcutaneous, Once, Starting 3/4/19, Avoid use within 24 hours of dihydroergotamine administration.	
<input type="checkbox"/>	dihydroergotamine (DHE) injection 1 mg, Intravenous Push, Once, Starting 3/4/19, Dose may be repeated hourly up to a maximum of 2 mg daily. Avoid use within 24 hours of triptan administration.	
<input type="checkbox"/>	ondansetron (ZOFTRAN-ODT) disintegrating tablet 4 mg, Oral, Once	
<input type="checkbox"/>	ondansetron *PF* (ZOFTRAN) injection 4 mg, Intravenous Push, Once	
Next Required		✓ Accept

# Methods

- Two-arm study of patients at PRMC and PVR
  - Order panel and non-order panel patients were compared via retrospective chart review

Inclusion Criteria
Visit to PRMC or PVR ED without hospital admission
Age $\geq$ 18
Receipt of an opioid and/or a medication on the non-opioid panels for pain management

Exclusion Criteria
Additional visit to ED within 72 hours
No documented pain scores using 1-10 pain scale
Patients administered methadone, buprenorphine, or extended-release opioids

# Outcomes

- Primary:
  - Oral Morphine Equivalents (OMEs) received during ED visit
- Secondary:
  - ED length of stay
  - Prescription for opioid issued on discharge
  - Non-opioid pain mediation used prior to opioid administration
  - Pain scores

# Statistics

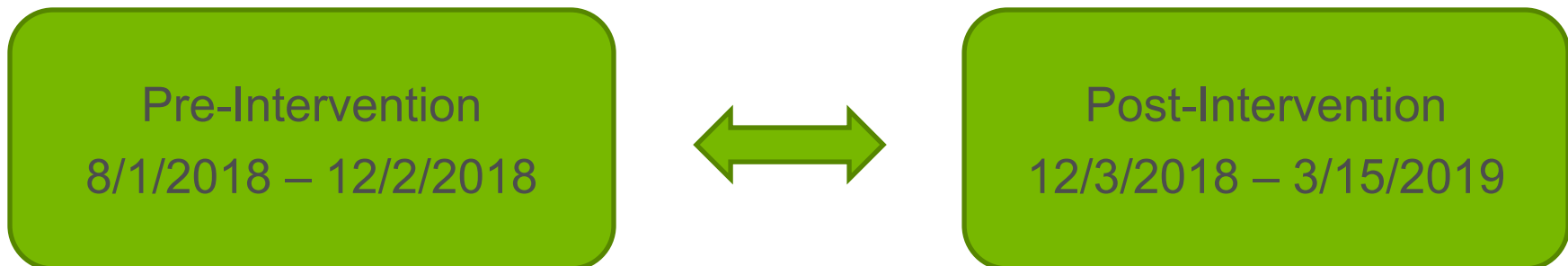
- Microsoft Excel, SPSS
- Descriptive Statistics
  - Median, Interquartile range (IQR)
  - Non-normally distributed data
- Inferential Statistics
  - Chi-Squared Tests
  - Mann-Whitney U Tests
  - $\alpha = 0.05$ , significant values bolded

# Study Enrollment

- 14,741 patients included from 8/1/2018 – 3/15/2019
  - 17,512 patients before exclusion criteria
- Major exclusions:
  - Missing pain scores (1,592 - 9%)
  - Additional visit to ED within 72 hours (931 - 5%)

# Time Control Groups

- Outcomes were compared between patients in the pre-intervention and post-intervention periods
  - Served as a control to assess difference in outcomes resulting from concomitant, non-order panel efforts to promote safe opioid prescribing
- Order panel patients were excluded to reduce bias when assessing if date of visit affected outcomes



# Time Control Groups (Continued)

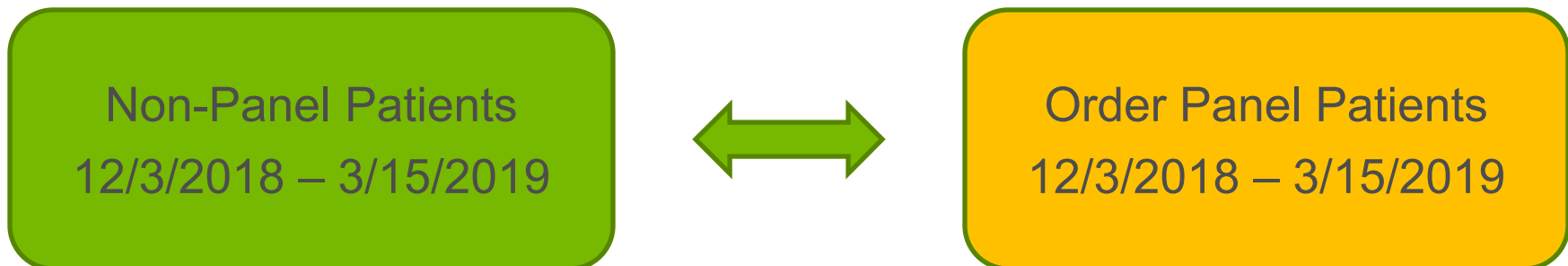
- Date of visit was associated with significant differences in primary and secondary outcomes
  - Likely attributable to other concomitant efforts nationwide and at Parkview Health to promote safe opioid prescribing

	<b>Pre-Intervention (n = 7860)</b>	<b>Post-Intervention (n = 6524)</b>	<b>p Value</b>
Received Opioids % (n)	50.9% (4001)	47.2% (3082)	<0.001
Discharge Prescription for Opioid % (n)	27.5% (2158)	22.0% (1435)	<0.001



# Study Groups

- Outcomes were compared between order panel patients and non-order panel patients from the same post-intervention time period
- Assessed to see if order panels impacted outcomes without bias of visit date



# Baseline Characteristics

- Median age of order panel patients was lower than non-panel patients
- Male-to-female ratio was similar between groups

	<b>Non-Panel Patients (n = 6524)</b>	<b>Order Panel Patients (n = 357)</b>
Age (years) Median (IQR)	40 (29 - 55)	36 (27 - 45)
Male Sex % (n)	35.1% (2418)	36.1% (129)

# Results – Primary Outcome

	Non-Panel Patients (n = 6524)	Order Panel Patients (n = 357)	p Value
Received Opioids % (n)	47.2% (3082)	21.3% (76)	<0.001
OME Average Median (IQR)	12.0 (7.5 - 20)	10 (7.5 - 15)	0.044
Received Non-Opioids % (n)	67.8% (4425)	100.0% (357)	<0.001

# Results – Secondary Outcomes

	Non-Panel Patients (n = 6524)	Order Panel Patients (n = 357)	p Value
Discharge Prescription for Opioid % (n)	22.0% (1435)	10.6% (38)	<0.001
Non-Opioid Administered First % (n)	26.3% (259/983)	43.4% (33/76)	0.001
Length of Stay (min) Median (IQR)	152 (108 - 210)	159 (123 - 199)	0.114

# Pain Score Evaluation

	Non-Panel Patients (n = 6524)	Order Panel Patients (n = 357)	p Value
Initial Pain Score Median (IQR)	8 (7 – 10)	8 (7 – 10)	0.114
Minimum Pain Score Median (IQR)	6 (4 – 8)	6 (4 – 8)	0.066
Maximum Pain Score Median (IQR)	8 (7 – 10)	8 (7 – 10)	0.410
Average Pain Score Median (IQR)	7 (5 – 9)	7 (5 – 9)	0.088

# Conclusions

- Order panel patients used less OMEs
  - Less likely to have received opioids
  - Less likely to receive opioid prescription on discharge
- Order panel patients were more likely to receive a non-opioid prior to opioid administration
- Pain scores and ED length of stay were similar across groups

# Limitations

- Retrospective Study Design
  - Inability to account for missing data
- Patients on opioids prior to arrival not excluded
- Small sample size of patients receiving panel orders in the study population

# Next Steps

- Further order panel promotion
  - To date, around 1400 unique orders for over 1000 patients have been entered across the health system
- Incorporate ketamine ordering into panel
- Further expand upon current order panels with guidance by pain indication



# Acknowledgements

- Mentors
  - Jared Netley, PharmD, BCPS, MPA
  - Will Armstrong, PharmD, BCPS
- Data Collection
  - Sarah Ferrell, PharmD
- Panel Feedback
  - Dr. Thomas Gutwein
  - Parkview Emergency Physicians Group

# References

1. CDC/NCHS, National Vital Statistics System. Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2018. <https://wonder.cdc.gov>. Accessed 2/27/2019.
2. Cicero TJ, Ellis MS, Surratt HL, Kurtz SP. The changing face of heroin use in the United States: a retrospective analysis of the past 50 years. *JAMA Psychiatry*. 2014;71(7):821-826
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4. Optimizing the Treatment of Acute Pain in the Emergency Department. *Annals of Emergency Medicine*. 2017;70(3):446-448. doi:10.1016/j.annemergmed.2017.06.043.
5. 2017 Opioid Prescribing and Treatment Guidelines: Confronting the Opioid Epidemic in Colorado's Emergency Departments. *Colorado ACEP*. <https://www.coacep.org/>. Published 2017, accessed 2/27/2019.
6. American College of Emergency Physicians. EQUAL Network Opioid Initiative. ACEP. <https://www.acep.org/administration/quality/equal/e-equal-opioid-initiative/#sm.0009g5pc01be8ewlqpx1vslf74sik>. Updated 2018. Accessed September 2, 2018.

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