

Making Reducing Opioid Related Harms the Easy Thing to Do

M. Kit Delgado, MD, MS

Assist. Prof. of Emergency Medicine & Epidemiology

Director, Penn Medicine Nudge Unit

Co-Chair, Penn Medicine Opioid Task Force

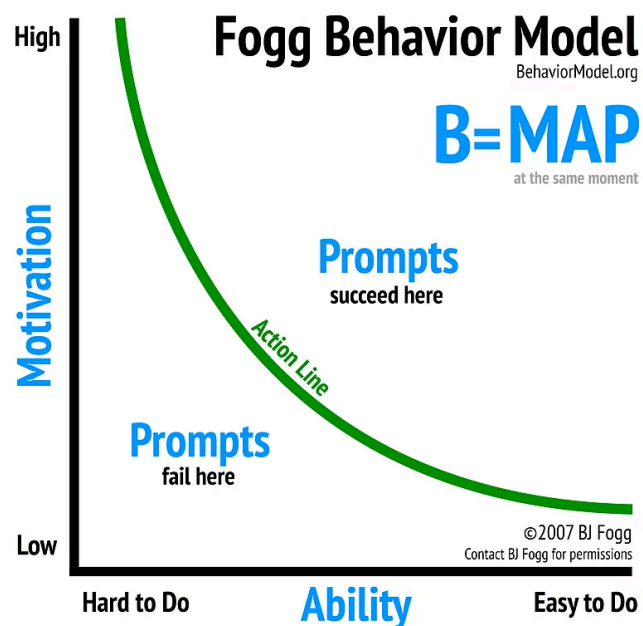
Presenter



Dr. M. Kit Delgado, MD, MS

- I have received research funding from PCORI, FDA, CDC, and NIH
- I do not have any disclosures

Simple model for designing behavioral interventions



B=MAP

To change behavior, need:

1. Motivation
2. + Ability
3. + Prompt

EAST

Make intervention:

1. Easy
2. Attractive/Social
3. Timely

Nudges for opioid prescribing stewardship

ED Discharge Quantity Defaulted to 10 pills

ED Visit: Zzz, Aaa
Female, 66 y.o., 02/10/1950
MRN: 4461... CC: STEMI Alert, Cardi... Temp: 1... Resp: 0 Height: 5' 4" (162.6 cm) / E...
CSN: 13503... Allergies: Amoxicillin... Pulse: 225 SpO2: 86 Weight: 130 lb (59 kg) / Ad...
HAR: 2241... Status: Observation BP: 82/45 CrCl: None BMI: 30.90 kg/m²
UID: 84461... Room: OTF BSA: 1.63 m²

Medications:

Name	Dose	Frequency	End	Route	Rx	Qty	Unit	R	Formulan	Coverag	Pref Lis
oxycodone-acetaminophen (PERCOCET) tablet 5-325 mg				oral	Ger	10	tablet	0			UPHS E
oxycodone-acetaminophen (PERCOCET) tablet 5-325 mg				oral	Ger	20	tablet	0			UPHS E

Procedures:

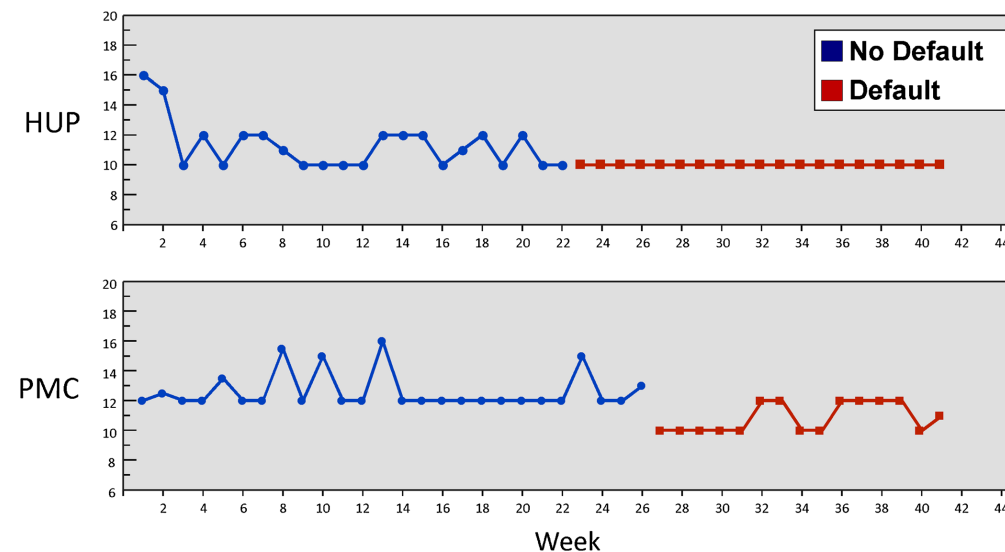
Name	Px Code	Type	Pref List	Available Resulting Agencies
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Order Panels:

Name	Dose	Frequency	Route	Rx	Px Code	Type	Q	U	F	Formulan	Cover	Pref L	Col	Available Res
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Medications: 2 loaded. No more to load. Procedures: No items found. Panels: No items found.

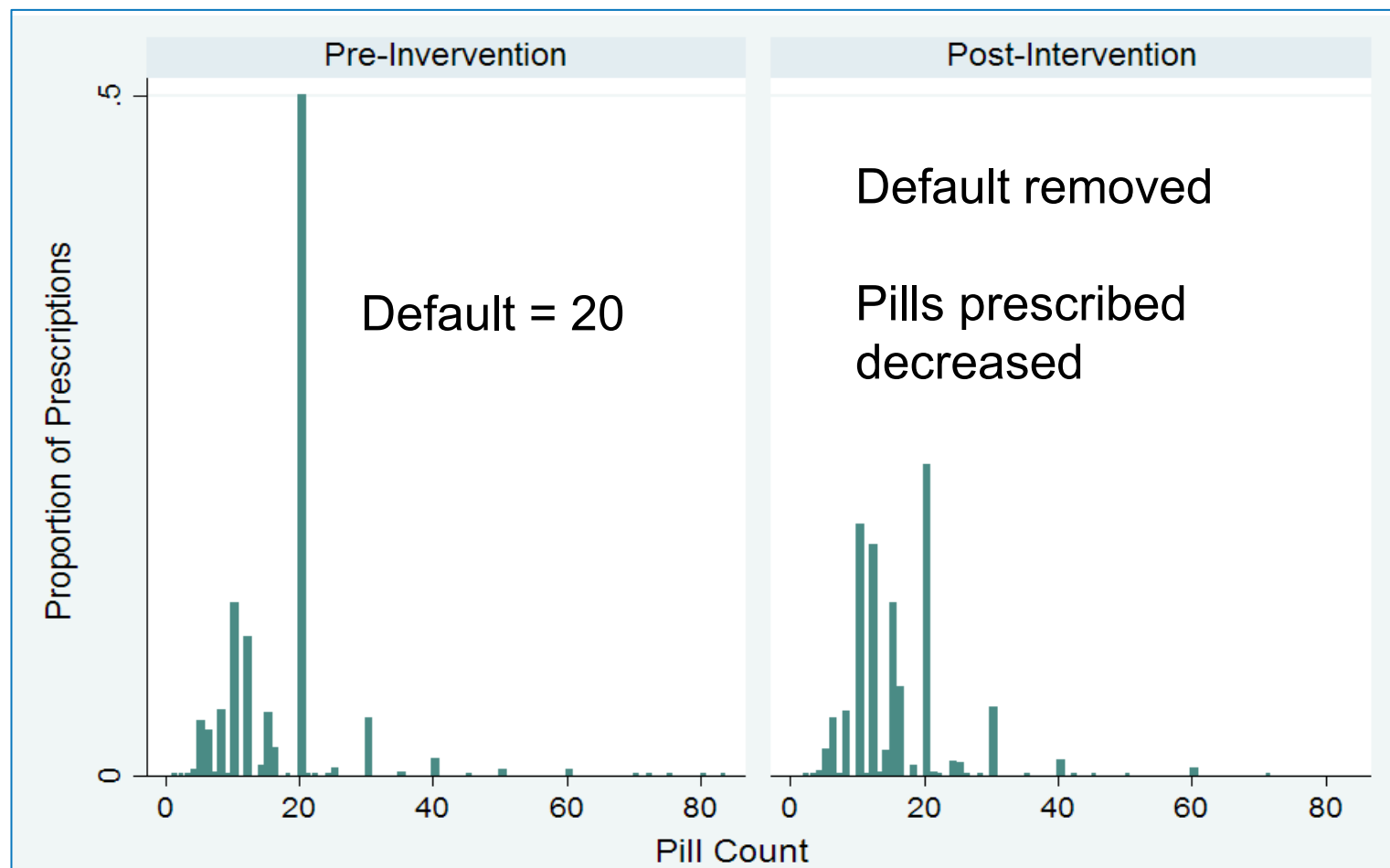
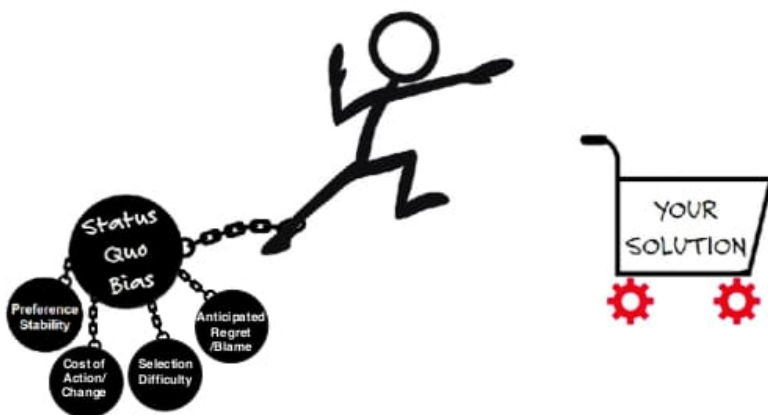
QTY #10



% of Rx for 10 pills doubled: 21% to 43%

Delgado MK...Perrone, JM, JGIM, 2018

However, defaults can lead to *over* prescribing if set too high



Lots of opportunity reduce defaults opioid tablet orders in U.S. EDs

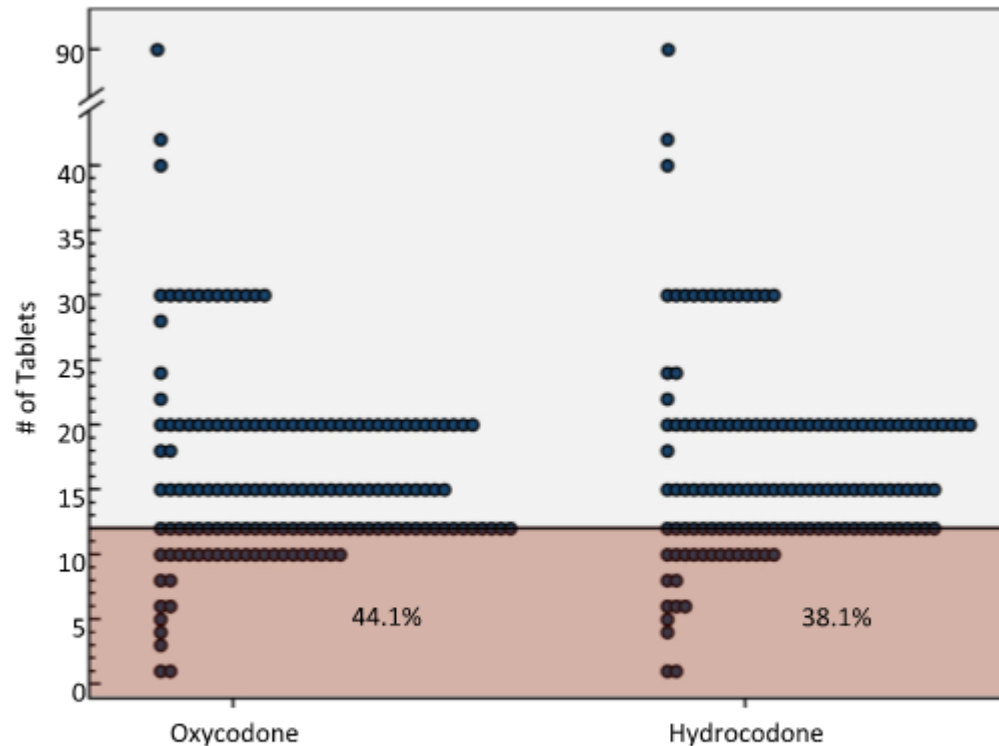
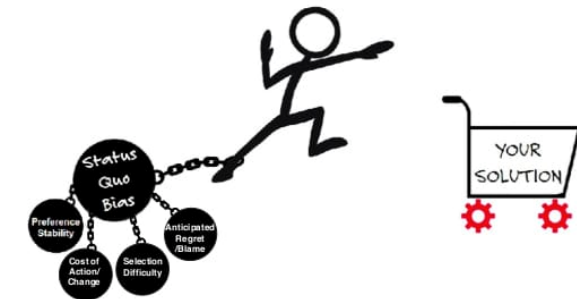


Fig. 1. Distribution of emergency department default opioid tablet order quantities among survey respondents and proportion for a standard 3-day supply (12 tablets) or less.



Lidocaine patch added to menu of routine ED orders

Orders

Quick List | Active | All Orders | LOA Orders | Results | Signed & Held | Home Meds | Recurring

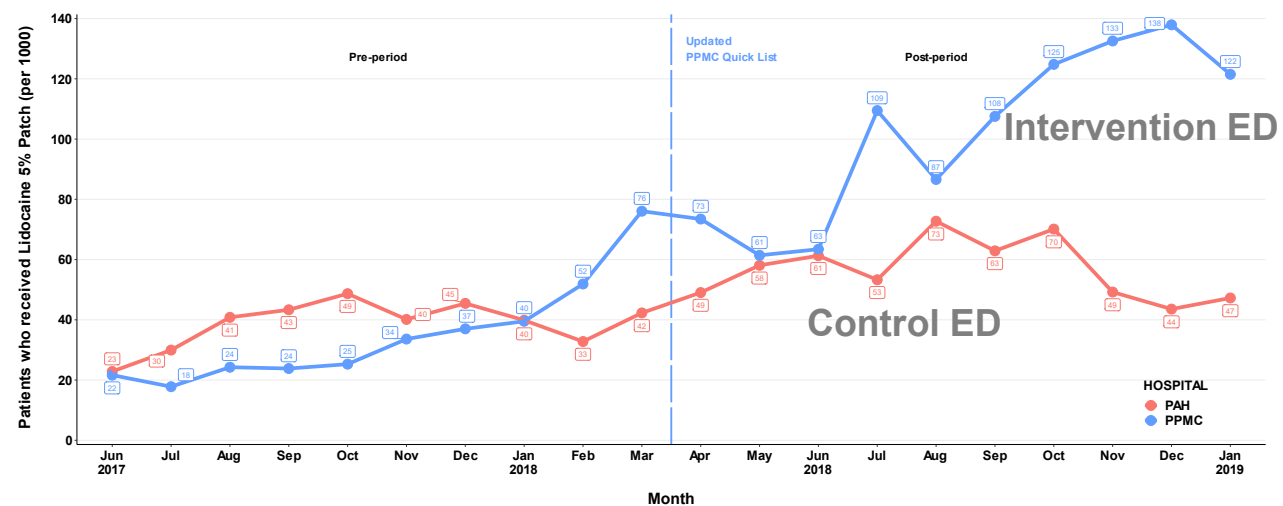
Quick List | Imaging | Nursing | Antibiotics | Protocols | Trauma Initial | Trauma Medications

Medications

- ☐ Fluid Challenge LR - 500 mL
- ☐ Fluid Challenge LR - 1000 mL
- ☐ Fluid Challenge LR Sepsis - 30 mL/kg
- ☐ Fluid Maintenance
- ☒ acetaminophen (TYLENOL) tablet - 975 mg
- ☐ albuterol / atrovent nebulizer solution 5 mg / 2.5 mL
- ☐ aspirin chewable tablet - 324 mg
- ☐ diphenhydramine (BENADRYL) injection - 25 mg IV
- ☐ gi cocktail (Maalox and Lidocaine visc) oral susp - 45 mL
- ☐ HYDROMORPHONE (DILAUDID) injection - 1 mg IV
- ☐ ibuprofen (ADVIL;MOTRIN) tablet - 600 mg
- ☐ ketorolac (TORADOL) injection - 15 mg IV
- ☒ lidocaine 5% patch
- ☐ lidocaine 1% - 10 mL SQ
- ☐ lidocaine 1% with EPINEPHRINE - 30 mL SQ
- ☐ LORAZEPAM (ATIVAN) injection - 2 mg IV

Labs

- ☐ Aspirin (Salicylate) and Tylenol (Acetaminophen) Levels
- ☐ Basic Metabolic Panel
- ☐ Beta Hydroxybutyric Acid (Ketones)
- ☐ BNP Level
- ☐ CBC with Diff
- ☐ Creatine Kinase (CPK)
- ☐ Creatinine Only - STAT lab syringe
- ☐ CRP (Non Cardiac - Ortho Only) / ESR (Sedimentation Rate)
- ☐ D-Dimer
- ☐ Drug Screen, Urine
- ☐ ETOH (Ethanol) Level
- ☐ HCG Quantitative
- ☐ HCG Urine (ED)
- ☐ HIV Screening and Consent
- ☐ Lipase
- ☐ LFTs (Liver Injury Panel)



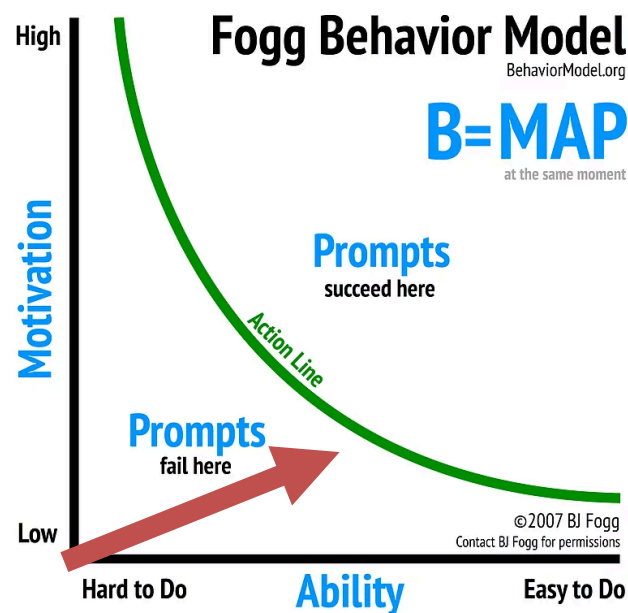
Rate of Lidocaine patch orders doubled

Yadav, K, Moon, J, Delgado, MK (in process)

Nudges for increasing evidence-based treatment for OUD

Clinicians



- Motivation
 - ▶ Stigma
- Ability
 - ▶ Effort to identify patients
 - ▶ Effort to engage patients
 - ▶ Money/effort to get X-waiver
 - ▶ Competing interests
- No prompts to activate treatment pathways



Patients

- Motivation
 - ▶ Withdrawal, stigma
 - ▶ Addictive nature of drugs/present bias
- Ability
 - ▶ Environments encourage drug use/isolation
 - ▶ Treatment difficult to access
 - ▶ Lack of \$, ID, transportation, housing
 - ▶ Many treatment options don't offer life-saving medications for OUD
- Lack of prompts to engage in treatment once leave ED. Many prompts to use drugs again

Making it Easy: ED Buprenorphine Induction Orderset with Clinical Decision Support

Buprenorphine Induction Pathway  Personalize 

Ensure the patient does not have activated opioid receptors.
This can precipitate withdrawal with buprenorphine administration.

Confirm time since last opioid use:
IV heroin/fentanyl: >6 hours
Short-acting oral opioids (morphine IR, oxycodone IR): > 12 hours
Extended release opioids (morphine ER, oxycodone ER): > 24 hours
Methadone: > 72 hours

Call the Center of Excellence at 267-809-5080 to reach a Care Coordinator

Click below for Dorsata pathway:
[- Buprenorphine Induction Pathway](#)

Laboratory

▼ Laboratory

Confirm negative HCG in females of child bearing age prior to initiating buprenorphine/naloxone therapy.

Urine drug screen results are not required to initiate buprenorphine/naloxone therapy, but is needed for later outpatient planning.

No results found for: HCGURINE

☐ Drug Screen, Urine
Once, Routine, URINE

☐ HCG Urine (ED)
STAT, Once for 1 occurrence

COWS Score

▼ COWS Score

Maximum daily dose for this indication is buprenorphine 16 mg/naloxone 4 mg.

Patient's last COWS score:

☐ COWS < 8
☐ COWS 8 - 12
☐ COWS > 12

Making it Easy: Discharge Smartset

ED Visit

Refresh

Doc to Doc

Print AVS

Tx Team

Quick Vitals

Validate Data by Device

Review Visit

Consult Update

Chart Review

MedView

Orders

Snapshot

ED Visit

Dispo

Care Everywh...

ACP

Carealign

DISCHARGE

Departure Condition

SmartSets

Disposition

Clinical Impression

Orders and Rx

Discharge Inst

Follow-Up

Preview/Print AVS

LETTERS

Work/School Exc...

Incidental Findings

DMV

Letters

Results

ADMIT AND OBS

Doc to Doc

EXTRAS

BestPractice

Discharge Docum...

Document

Disposition

Clinical Scores

Clinical Impression

☐ Opioid abuse [F11.10]
☐ Mild opioid use disorder [F11.10]
☐ Moderate opioid use disorder [F11.20]
☐ Severe opioid use disorder [F11.20]
☐ Opioid overdose [T40.2X1A]
☐ Opioid withdrawal [F11.23]

Prescriptions

☐ buprenorphine-naloxone 8-2 MG SL tablet
Print, Disp-6 tablet, R-0

☒ naloxone (NARCAN) 4 MG/0.1ML LIQD
0.1 mL by intraNASAL route as needed (unresponsiveness). May repeat every 2-3 minutes until patient responsive or EMS arrives
Print, Disp-1 each, R-0

Discharge Instructions

☐ ACCESSING TREATMENT-MAT

☒ OPIOID USE DISORDER: GENERAL INFO (ENGLISH)

☒ OPIOID OVERDOSE: NALOXONE: GENERAL INFO (ENGLISH)

☐ OPIOID WITHDRAWAL (ENGLISH)

Follow Up

☒ Center of Excellence Opioid Treatment Program

☐ NET Access Point

☐ Primary Care Provider

☐ Your Doctor

Ad-hoc Orders

Buprenorphine

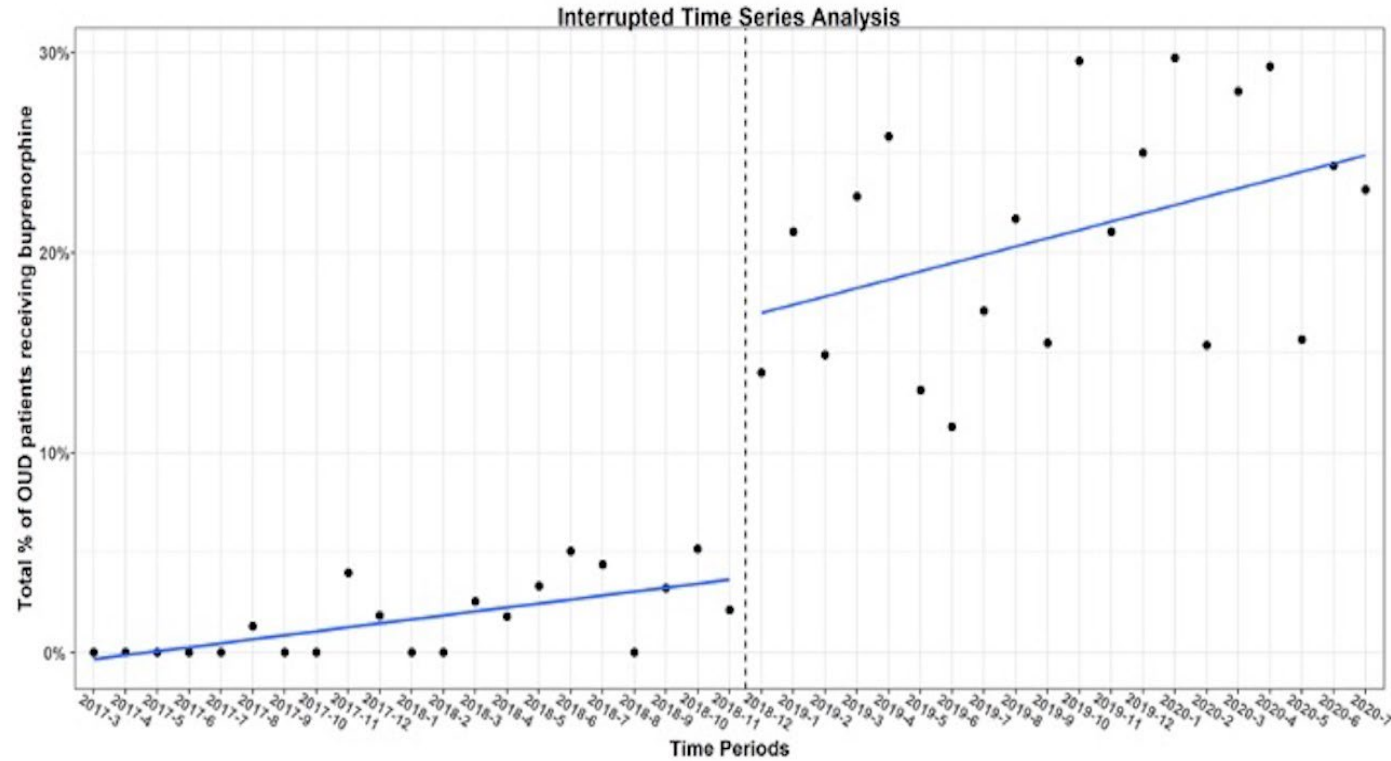
Naloxone

Treatment Connection

@kit_delgadoMD

Sustained Implementation of a Multicomponent Strategy to Increase Emergency Department-Initiated Interventions for Opioid Use Disorder

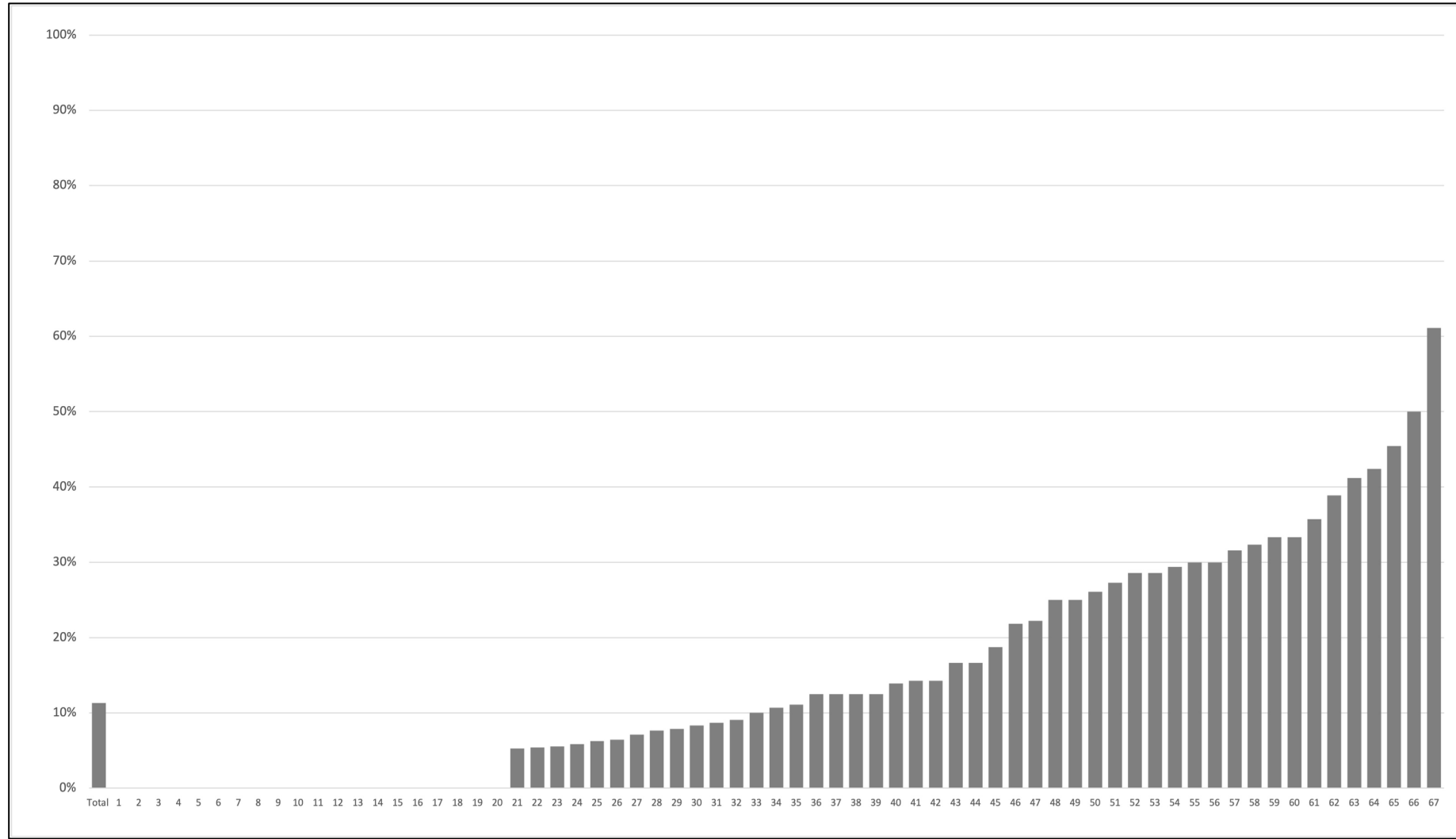
Margaret Lowenstein, MD, MSHP*; Jeanmarie Perrone, MD; Ruiying A. Xiong, MS; Christopher K. Snider, MPH; Nicole O'Donnell, CRS; Davis Hermann, MD; Roy Rosin, MBA; Julie Dees, MBA, MA; Rachel McFadden, BSN, RN; Utsha Khatri, MD, MSHP; Zachary F. Meisel, MD, MS; Nandita Mitra, PhD; M. Kit Delgado, MD, MS



Interrupted time series analysis of buprenorphine use over time before and after ED intervention implementation

Provider-level buprenorphine prescribing before and after ED intervention implementation

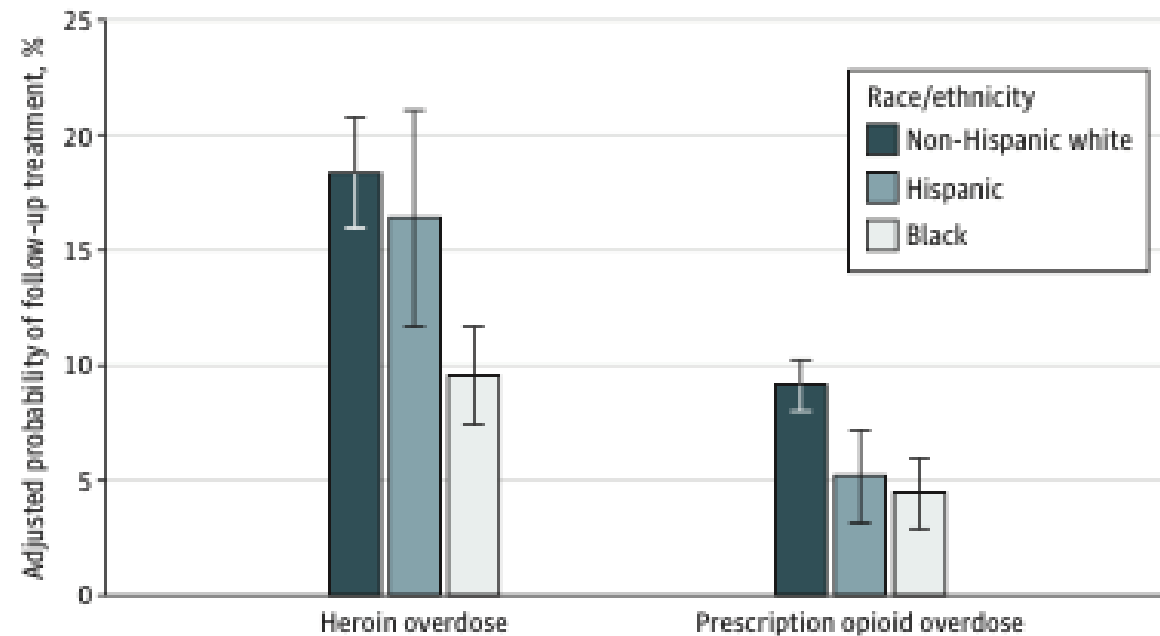
Rate of buprenorphine prescriptions per OUD-related encounter for all providers with 10 or more OUD-related encounters in the pre and post period.

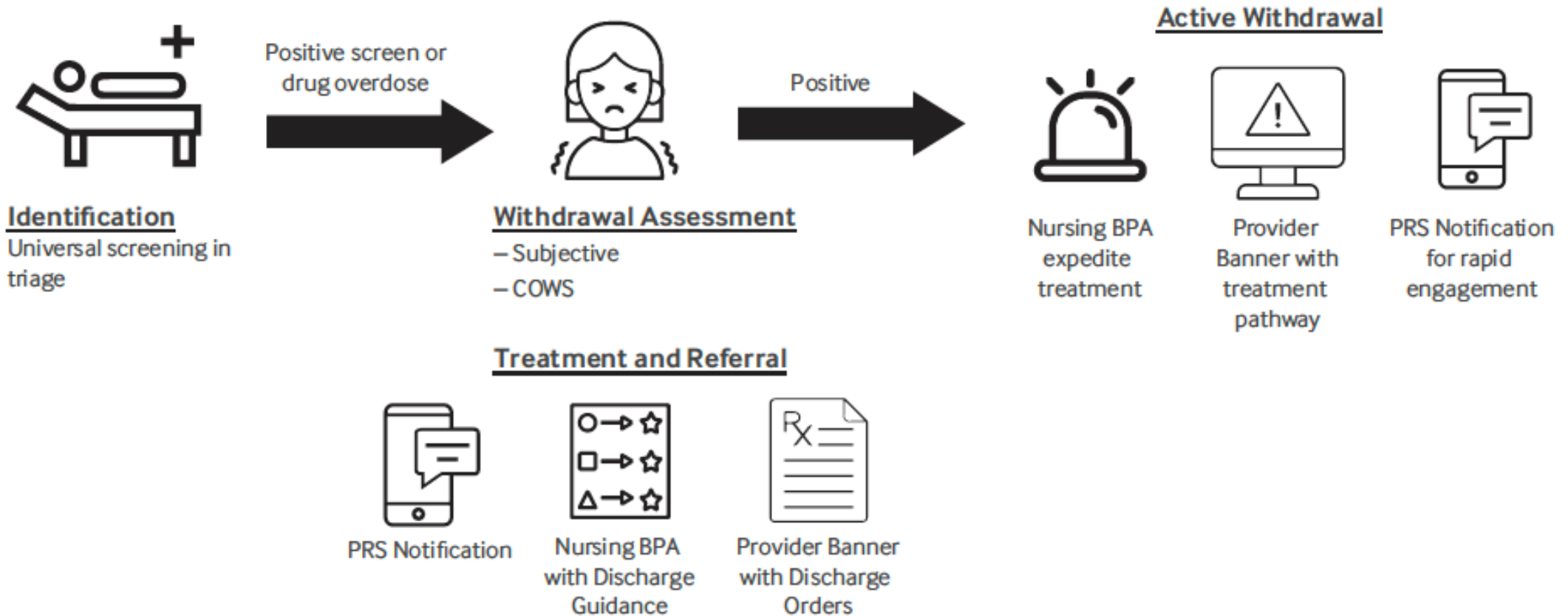


Incidence of Treatment for Opioid Use Disorder Following Nonfatal Overdose in Commercially Insured Patients

Austin S. Kilaru, MD, MSHP; Aria Xiong, MS; Margaret Lowenstein, MD, MPhil; Zachary F. Meisel, MD, MPH, MSHP; Jeanmarie Perrone, MD; Utsha Khatri, MD; Nandita Mitra, PhD; M. Kit Delgado, MD, MS

Figure 3. Average Adjusted Probability of Follow-up Treatment After Opioid Overdose, by Overdose Type and Race/Ethnicity





“In the last week, have you struggled with pain killers, or used heroin or fentanyl?”

Opioid Use Screen

↓ In the last week, have you struggled with pain killers, or used Heroin or Fentanyl?

No (Negative)

Yes (Positive)

Drug Overdose

Unable to Assess



Answer Selections:

- **No (Negative)** → End of screening
- **Unable to Assess** → Patient in acute distress/non-verbal (but *not* suspected overdose)
- **Drug Overdose** → Patient presents for probable overdose involving illicit substance
- **YES (Positive Active OUD)** → *“Do you feel like you are experiencing withdrawal now?”*
 - Yes response → nurses prompted to measure a COWS score in triage

ED Visit



 Refresh |  Doc to Doc |  MPM AVS |  Print AVS |  Tx Team |  Quick Vitals |  Data Validate |  Review Visit |  Consult Update

Document

Disposition

Clinical Scores

BANNERS

Banners

MYNOTE

Chief Complaint

Allergies

Home Medications

History

OB/Gyn Status

Orders

Provider Notes

Banners



This patient has active OUD. Click here to use the OUD orderset.

Chief Complaint

Detox

Homeless

Orders

Clear All Orders

Opioid Use Disorder

Manage User Versions

All patients with OUD should be offered buprenorphine. The dose varies on withdrawal severity. See below for dosing guidance based on COWS.

Standard doses of buprenorphine may precipitate withdrawal in patients with recent opioid use. Consider giving micro-dosages (< 0.5mg buprenorphine or 450mcg Belbuca) on patients not yet in withdrawal.

Providers can consult a substance use navigator 7 days a week between 9am-9pm by calling 484-278-1679.

- [Click here for the Dorsata pathway on OUD](#)

Laboratory

Pregnancy testing and urine drug screening are not required prior to initiating therapy but help guide follow up. If pregnant, the preferred formulation is buprenorphine-only, but buprenorphine-naloxone is acceptable alternative.

Laboratory

Click for more

Clinical Opioid Withdrawal Scale (COWS)

COWS

Total COWS Score: 7
(02/08/22 0116 : Chukwu, Franklin, RN)

☐ COWS < 13 (micro-dosing)

☐ COWS > or = to 13 (standard dosing)

Symptom management

Symptom management

☐ Pain

☐ Anxiety and restlessness

☐ Gastrointestinal discomfort

Ad hoc Orders

Search

You can search for an order by typing in the header of this section.

DC Smartset: Standard Dose Bupe + Naloxone + CareConnect

Prescriptions

☒ Standard induction

☒ buprenorphine-naloxone 8-2 MG per sublingual film

Use 1 film every 12 hours for 7 days

E-Prescribe, Disp-14 film, R-0



NADEAN: X***

Maximum MME/Day: Unknown for this order



This medication will not be e-prescribed. Invalid items: Medication Details...

☐ Microinduction of Buprenorphine

☒ Take home naloxone

☒ naloxone (NARCAN) 4 MG/0.1ML LIQD



0.1 mL by intraNASAL route as needed (unresponsiveness) for up to 7 days. 1 spray per nostril every 2 minutes until patient is responsive

Print, Disp-1 each, R-1

Discharge Instructions

Discharge Instructions

☒ Opioid use disorder

☒ How and when to use intra-nasal naloxone

☐ Accessing medication-assisted treatment

☐ Microinduction of buprenorphine

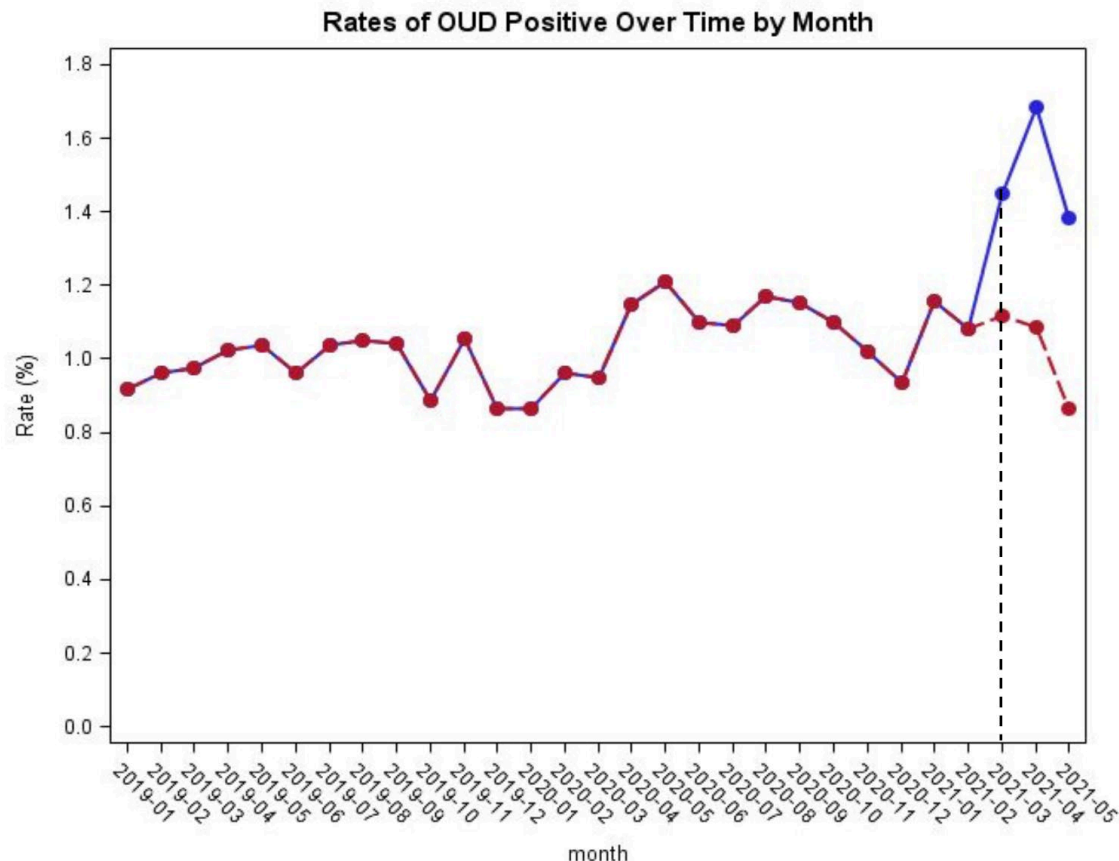
☐ Opioid withdrawal

Follow Up

Follow Up

☒ Careconnect Warmline

Making OUD Treatment Engagement Default Option



Screening by default -> 50%
increase in patients identified
would benefit from treatment

Easy to implement: + screens
only 1 extra minute to triage
time

NEJM
Catalyst | Innovations in Care Delivery

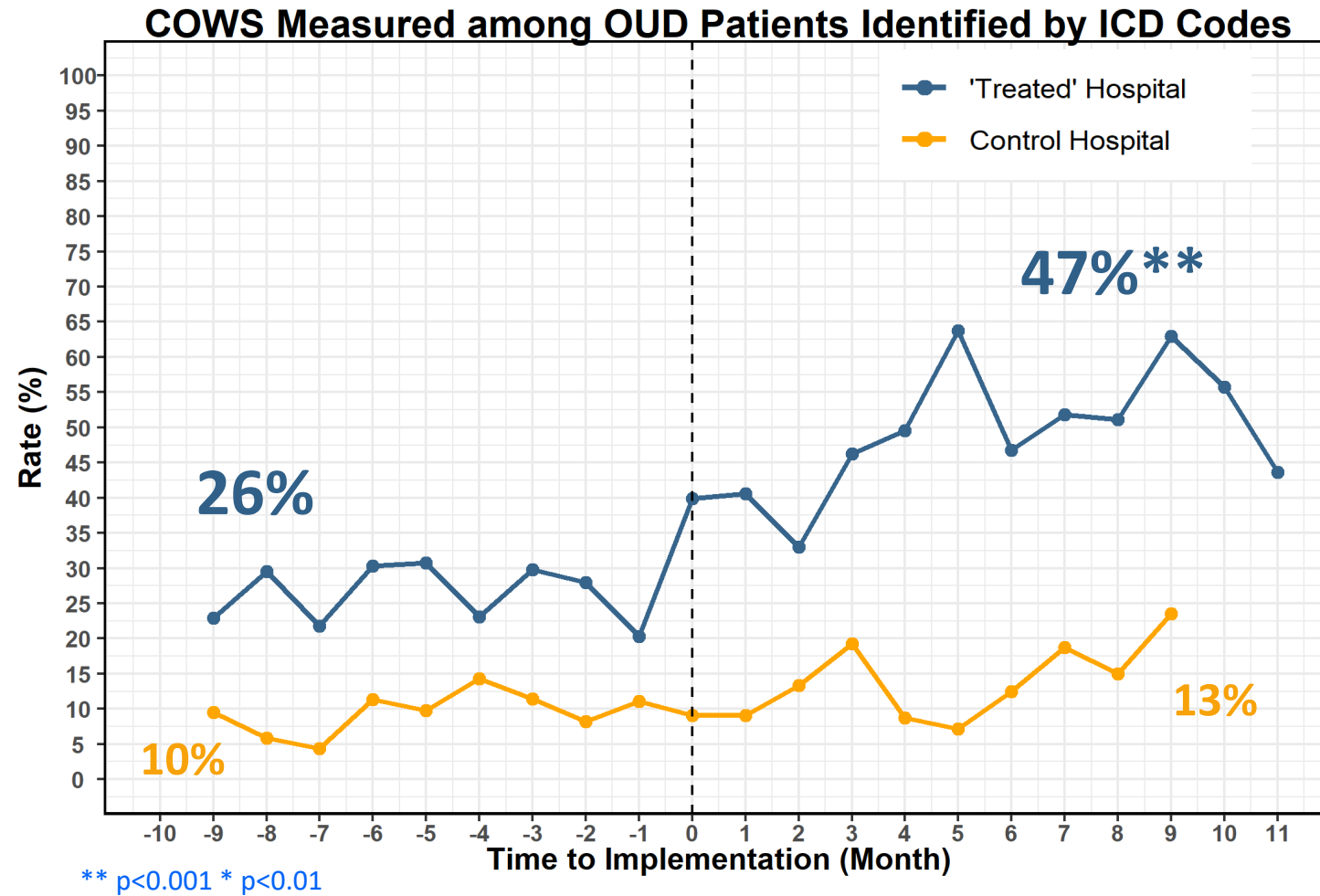
CASE STUDY

Redesign of Opioid Use Disorder Screening and Treatment in the ED

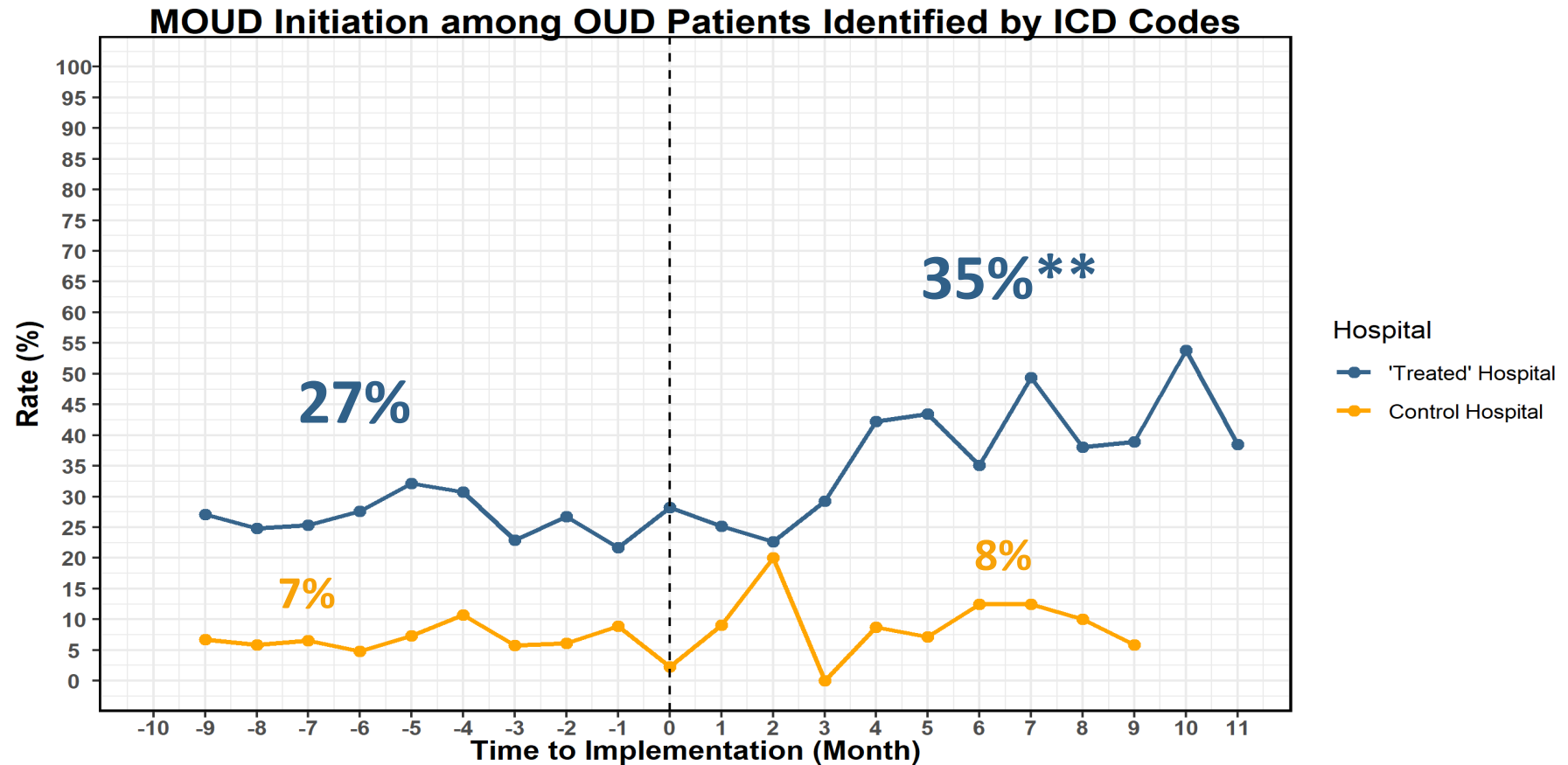
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Christian Wood, Gabrielle Solomon, Rinad Beidas, PhD, M. Kit Delgado, MD, MS

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Significant increases in COWS in treated hospitals



Significant increases in MOUD use in treated hospitals



** $p < 0.001$ * $p < 0.01$

Equity in Treatment Effects by Sex, Race (all increased <p, 0.05)

Visits identified using OUD- related ICD codes	Treated Hospitals		Control Hospitals	
	Pre	Post	Overall	Pre
n = OUD-related ICD codes	1258	1057	691	459
COWS Measured, overall	26%	47%	10%	13%
Male	27%	45%	12%	14%
Female	26%	51%	7%	11%
White	26%	49%	9%	13%
Non-White	26%	45%	12%	14%
Any MOUD, overall	27%	35%	7%	8%
Male	26%	34%	7%	6%
Female	27%	36%	7%	11%
White	25%	35%	7%	7%
Non-White	28%	34%	7%	11%

Questions?

More Questions? Mucio.Delgado@pennmedicine.upenn.edu

Thank You