Interrupted Time Series of User-centered Clinical Decision Support Implementation for Emergency Department-initiated Buprenorphine for Opioid Use Disorder

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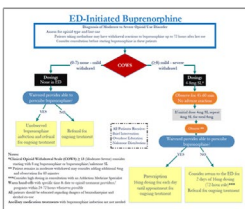
Background

- Emergency department (ED)-initiated Buprenorphine (BUP) is safe and effective for treating for Opioid Use Disorder (OUD) patients[1]
- Stigma, ED clinicians' unfamiliarity and misperceptions around BUP protocol are partly to blame[1]
- Our team developed a *user-centered, computerized clinical decision support system (CDS)*, called **EMBED,** to guide ED clinicians through process of BUP initiation in the ED[2–5]
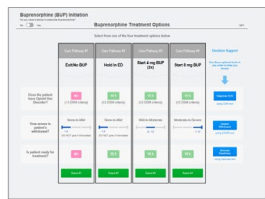
Objective

- To assess feasibility of implementation and evaluate preliminary efficacy of the CDS intervention (EMBED) in increasing the rate of ED-initiated BUP

**From a complex, multi-step process.....**

ED-Initiated Buprenorphine

Currently a 30 min workflow for an addiction counselor, that includes
- Diagnostic criteria
- Withdrawal assessment
- Assessing patient readiness for treatment
- Treatment initiation
- Referral – includes detailed forms, fax, etc;

.......to a simple, automated application

- Embedded within EHR
- Able to Identify, Treat and Refer – all completed within 2-5min of uninterrupted workflow.
  - No need to exit EHR
  - Able to bypass requirement of waiver training
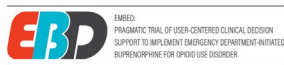
Methods

Design & Setting: An interrupted time series study conducted in an urban, academic ED to study the preliminary efficacy of the CDS intervention.

Participants: ED patients, 18 years or older, who met criteria for a validated computable phenotype based on structured electronic health record (EHR) data including opioid-related chief complaints, past medical history, and diagnosis codes

Intervention:
- Offers *flexible, optional clinical decision support* for:
1. OUD identification
2. Assessment of opioid withdrawal
3. Assessment of patient readiness to start treatment
4. Automated EHR activities for BUP initiation (eg. documentation, orders, prescribing, and referral)
- Brief in-person (***just-in-time***) training was conducted to train ED clinicians how to use the tool.

- *Pre-implementation phase* - Apr 2018 - Feb 2019
- *Implementation phase* - Mar 2019 - Aug 2019
- *Maintenance phase* - Sep 2019 – Dec 2019

- **Primary outcome:** Rate of ED-initiated BUP.
- **Secondary outcomes:** Rates of -
1. Intervention launch
2. Prescription for naloxone at ED discharge
3. Referral for ongoing addiction treatment

Results

- 141,041 unique patients presented to the ED. **906** (574 during pre-implementation and 332 during implementation) *met OUD phenotype and inclusion criteria*
- ***Rate of BUP initiation*** (i.e. BUP administered in the ED and/or prescribed on discharge) <u>*increased*</u> from 3.5% (20/574) in the pre-implementation phase to 6.6% (22/332) in the implementation phase (p=0.03).
- With ***just-in-time training***, rate of ***BUP initiation*** almost ***doubled*** (7.9% vs. 4.9%, p=0.28).
- Relative risk of BUP initiation with CDS was 2.73 times higher (95% CI 0.62, 11.99; p=0.18), after adjusting for number of physician's with X-waiver and other covariates
- *Unique attendings who initiated BUP* <u>*increased*</u> from 13.0% (7/53) to 22.8% (3/57), (p=0.10). Among them, 44% launched the intervention at least once.
- 32.3% of the attendings adopted the practice of ED-initiation of BUP
- *Rate of Naloxone prescription at discharge* <u>*increased*</u> from 6.5% to 11.5%, p<0.01.
- The intervention received a System Usability Scale score of 82.0 (95% CI 76.7-87.2).
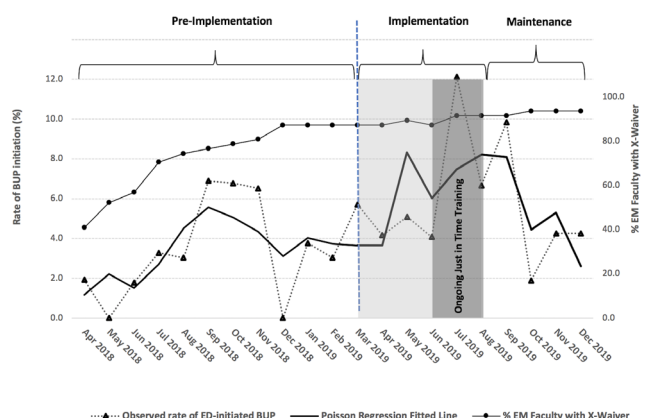
Conclusion

- **User-centered CDS to facilitate ED initiated BUP, at a single ED, was associated with increased rates of ED-initiated BUP and Naloxone prescribing among patients with OUD** and a **doubling of unique physicians adopting the practice**.

- A larger multi-system pragmatic **EMBED trial** (ClinicalTrial.gov NCT03658642) is under way to assess the intervention's effectiveness, scalability, and generalizability.[6]

Bibliography
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