Interrupted Time Series of User-centered Clinical Decision Support Implementation for Emergency-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
• Stigma, ED clinicians’ unfamiliarity and misperceptions around BUP protocol are partly to blame
• 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—5

Objective

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

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)
  5. 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

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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) increased 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 increased 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 increased 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.

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