Pragmatic trial of user-centered clinical decision support to implement emergency department-initiated buprenorphine for opioid use disorder

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Background

“This is part of emergency medicine now!”

1. The opioid crisis
   - Overdose deaths soared to 93K in 2020 (70K opioid)
   - >2M Americans have OUD

2. Medication treatment gaps
   - Less than 1 in 5 receive medication treatment

3. ED as critical access point
   - 5% mortality 1 yr after overdose
   - ED OUD visits still rising

4. BUP-initiation in the ED
   - Safe & doubles engagement in treatment
   - Multiple barriers to adoption

Acad Emerg Med, 2021; NY Times, 2021; SAMHSA, 2020; Drug Alcohol Depend, 2016; Ann Intern Med, 2018; JAMA, 2015; NEJM, 2018
User-centered design to simplify the process...

From a complicated, unfamiliar practice...

...to a simple, automated application
Automated workflow, never leaving the EHR

1) In patient’s chart
2) Click the EMBED button
3) 1-click to launch 1 of 4 care pathways and/or

3 optional tools to:
1. Diagnose OUD
2. Assess withdrawal severity
3. Motivate readiness

4) Automates EHR tasks

1. Orders
2. Notes
3. Prescriptions
4. Referral
5. Discharge instructions
Methods

- 18-month pragmatic, parallel, group randomized trial
- 18 EDs in 5 healthcare systems
- Allocation: 1:1 ratio to intervention & usual care arms with stratified covariate constrained randomization

<table>
<thead>
<tr>
<th>Intervention Group: 9 Emergency Departments</th>
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<tbody>
<tr>
<td>Control Group: 9 Emergency Departments</td>
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Ongoing Data Collection

- 18-month trial
  - Nov 2019
  - May 2021

- Participants: adult ED OUD patients meeting predetermined EHR phenotype & attending emergency physicians caring for them
- Control visits with attendings who practiced at both intervention & control sites excluded
- Intervention: CDS to support diagnosis & withdrawal assessment, motivate readiness & automate orders, notes, Rx, AVS, referral
- Outcomes: primary, initiation of BUP in ED; secondary, RE-AIM implementation outcome framework

Trial Registration NCT03658642
EHR Phenotype. *JMIR Med Inform*, 2019
Results

- 1,413,693 ED visits (775,873 intervention, 637,820 control) assessed for eligibility
- 5,047 OUD patients (2,787 intervention, 2,260 controls); 599 attendings (340 intervention, 259 control)
  - No difference in physician age or gender
- 37/340 intervention attendings initiated BUP 46 times after launching EMBED

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Counts</th>
<th>Unadjusted</th>
<th>Adjusted**</th>
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<tbody>
<tr>
<td></td>
<td>Intervention N (%)</td>
<td>Control N (%)</td>
<td>Effect size OR (95% CI)</td>
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<tr>
<td>Patients with BUP initiated*</td>
<td>233 (8.4)</td>
<td>193(8.5)</td>
<td>1.23 (0.57, 2.68)</td>
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<td>Unique attendings who initiated BUP</td>
<td>135 (39.7)</td>
<td>78 (30.1)</td>
<td>1.53 (1.08, 2.15)</td>
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<td>Attendings who obtained X-waiver during trial</td>
<td>50 (14.7)</td>
<td>30 (11.6)</td>
<td>1.33 (0.80, 2.20)</td>
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<td>Physician rate of BUP initiation per 100 OUD patients</td>
<td>9.2(7.7, 10.8)</td>
<td>7.6 (6.2, 9.2)</td>
<td>RR: 1.21 (0.93, 1.57)</td>
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Temporal Trends

COVID19 lockdowns

Cumulative proportion of physicians with an X-waiver

Cumulative proportion of physicians prescribing BUP 1+ times

Take home points

- Higher proportion of intervention physicians waived and who adopted practice of ED initiation of BUP
- Waivered proportion increased at same rate across study arms
- Adoption of ED initiation of BUP grew faster in intervention arm, diverging
Conclusions

Adoption of ED-initiation of BUP

- Patient level: no change, limitations of data collection (e.g., methadone not in EHR)
- Physician level: EMBED intervention increased adoption
- Unobservable innovations may fail to diffuse or diffuse slowly. To accelerate adoption of this life-saving practice, we must:
  - Embrace treating addiction as part of routine emergency care
  - Implement user-centered CDS with automated EHR workflows to facilitate adoption of this complex, unfamiliar practice

*Acad Emerg Med, 2021; Health Affairs, 2018*
Thank you to the EMBED Team