Formative Evaluation for ED-initiated Buprenorphine User-Centered Decision Support

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Background

Emergency departments represent a primary source of care for many patients presenting with opioid use disorder.

- Research demonstrates that Buprenorphine (BUP) is an effective treatment option for patients with opioid use disorder (OUD).1,2
- Treatment is rarely initiated as a part of routine ED care.
- CDS represents one approach to potentially accelerating adoption of ED-initiated BUP into routine emergency care.3,4
- Addition of new technological support in the clinical setting is not without challenges or risks.5,6
- Utilizing a user-centered design (UCD) process can improve efficiency and reduce errors due to design
- Objective: To develop a user-centered decision support tool for ED initiation of buprenorphine and referral for follow-up care for patients with OUD

Method

A four phase user-centered design (UCD) methodology with rapid iterative prototype development was used.

Phase 1: Need Assessment

- Observations of workflow
- Interviews:
  - Workflow
  - Roles
  - User needs

Phase 2: Initial Prototype Design

Outline work process, processes and content for decision support
- Decision support to assess for OUD based on Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)
- Opioid withdrawal severity with the clinical opioid withdrawal scale (COWS)
- Readiness for treatment.

Phase 3: Iterative Design Feedback

Interactive prototype built in InVision (InVision, New York, NY)
- Demonstrate navigation and functionality.
- Formal and informal feedback sessions
  - Overall impression of the tool’s content
  - Format
  - Usability
  - Likelihood of incorporating the tool in practice
- Recommendations reviewed by design team weekly and design revisions incorporated prior to next iteration testing.

Phase 4: Prototype Testing

- Followed phase 3 procedure with final prototype iteration
- Assessed ability of the tool to meet users needs at least 80% of the time (80/20 rule, usability.gov).

Participants offering feedback included 26 attending and resident physicians. A total of five prototypes were evaluated and iteratively refined. Termination of iterative design was based on consensus, cost and time constraints.

Needs Assessment

- Care steps for decision support/guidance
  - OUD Diagnosis
  - OUD Withdrawal Severity
  - Readiness for Treatment
  - Dosing
  - Referral

Initial Prototype Design

Design: BPA alert with structured step-by-step guidance
Feedback:
- Content reviewed for accuracy of the components and protocols
- Concerns with activation as an alert
- Timing of the alert led to quick dismissal without using the tool

Iteration 2

Design: User Activated Decision Support
Feedback:
- Process may be completed by team instead of individual
- Support users of varying levels of experience with protocol
- Too many steps

Iteration 3

Design:
- Independent activation of decision support and care pathways
- Single click care pathway
- UCD activation via 1 button
Feedback:
- Challenges with navigation
- Change labels for decision support

Iteration 4

Design:
- Care pathways in columns
- UCD activation text labeled and located in far left column
Feedback:
- Decision support needs to be more obvious
- Pathway numbering interpreted as steps
- Minimize text

Iteration 5 - Final Testing

Design:
- Independent activation of decision support and care pathways
- Decision support in right column
- Use of color and text to support navigation
Feedback:
- Tool easily learned without training
- Reasonable for use during routine emergency care

Results

A user-centered design process helped designers better understand users’ needs for a web-based clinical decision tool to support ED initiation of buprenorphine for OUD.

- Identified varying needs across user experience levels and familiarity with the protocol
- Needs analysis determined target processes were grounded in physician-centric processes (e.g., diagnostics, treatment and prescribing, referral).
- Formative testing suggested potential overlapping workflows across professions
- Produced a flexible design supporting both direct care pathways and user-initiated decision support.
- Current work supports the use of a pragmatic approach to rapid, iterative design for health information technology.
- Future work with the current CDS will include:
  - Summative usability evaluation
  - Implementation within existing ED workflows in a multi-site pragmatic clinical trial.

References


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