



# 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).<sup>1,4</sup>
- 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.<sup>5,6</sup>
- Addition of new technological support in the clinical setting is not without challenges or risks<sup>7-9</sup>
- 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 steps and content for decision support Decision support to assess for

- OUD based on Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> 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.

## Results

### Needs Assessment

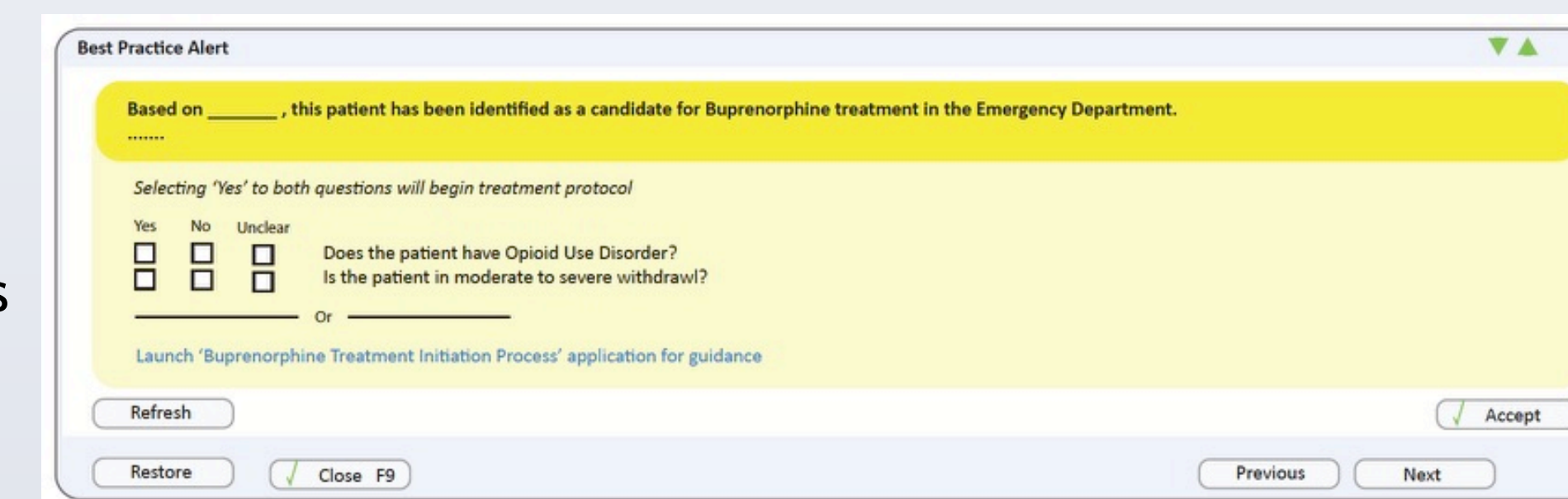
- Care steps for decision support/guidance
  - OUD Diagnosis
  - OUD Withdrawal Severity
  - Readiness for Treatment
  - Dosing
  - Referral

### 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

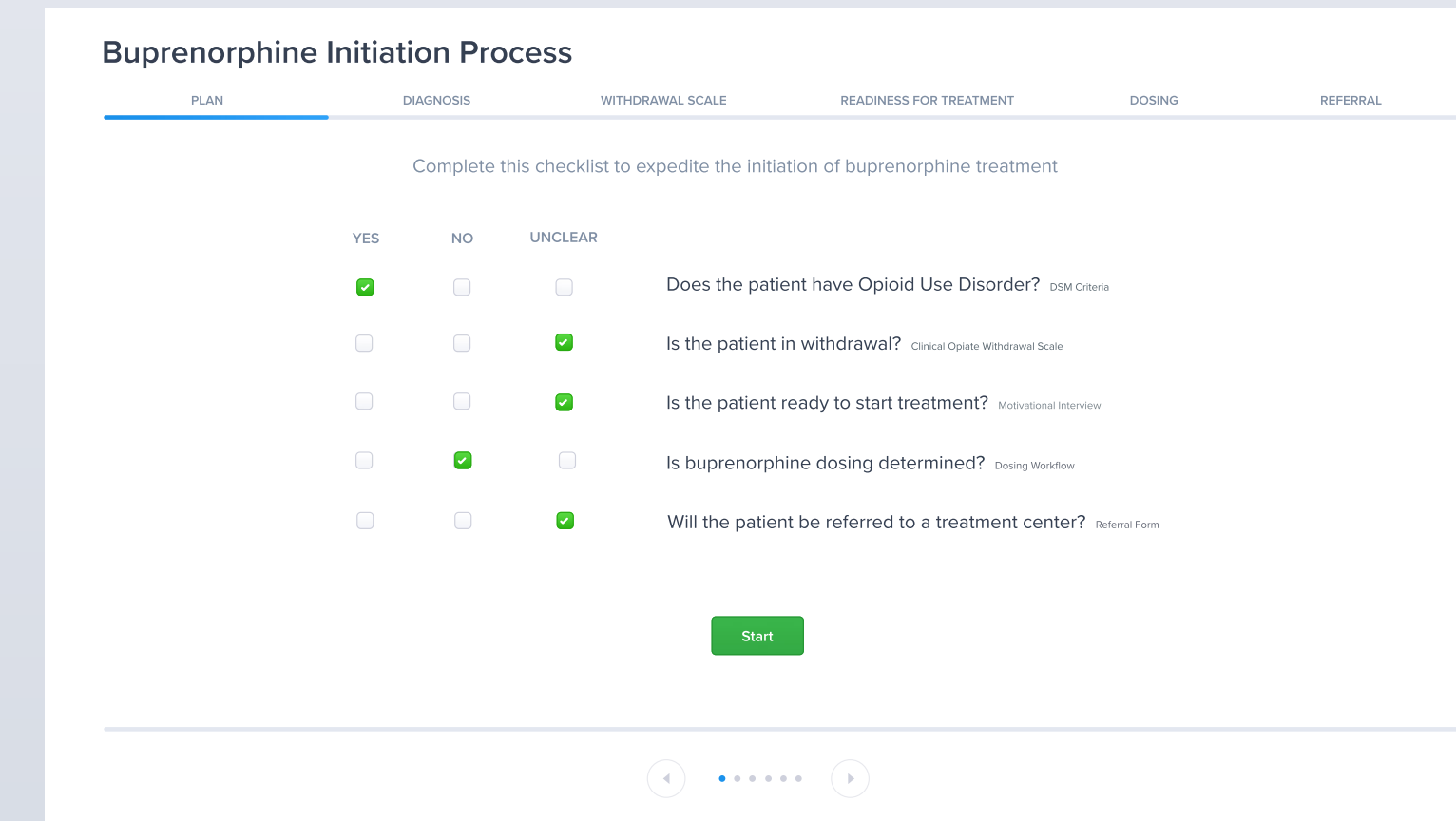


### Iteration 2

**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



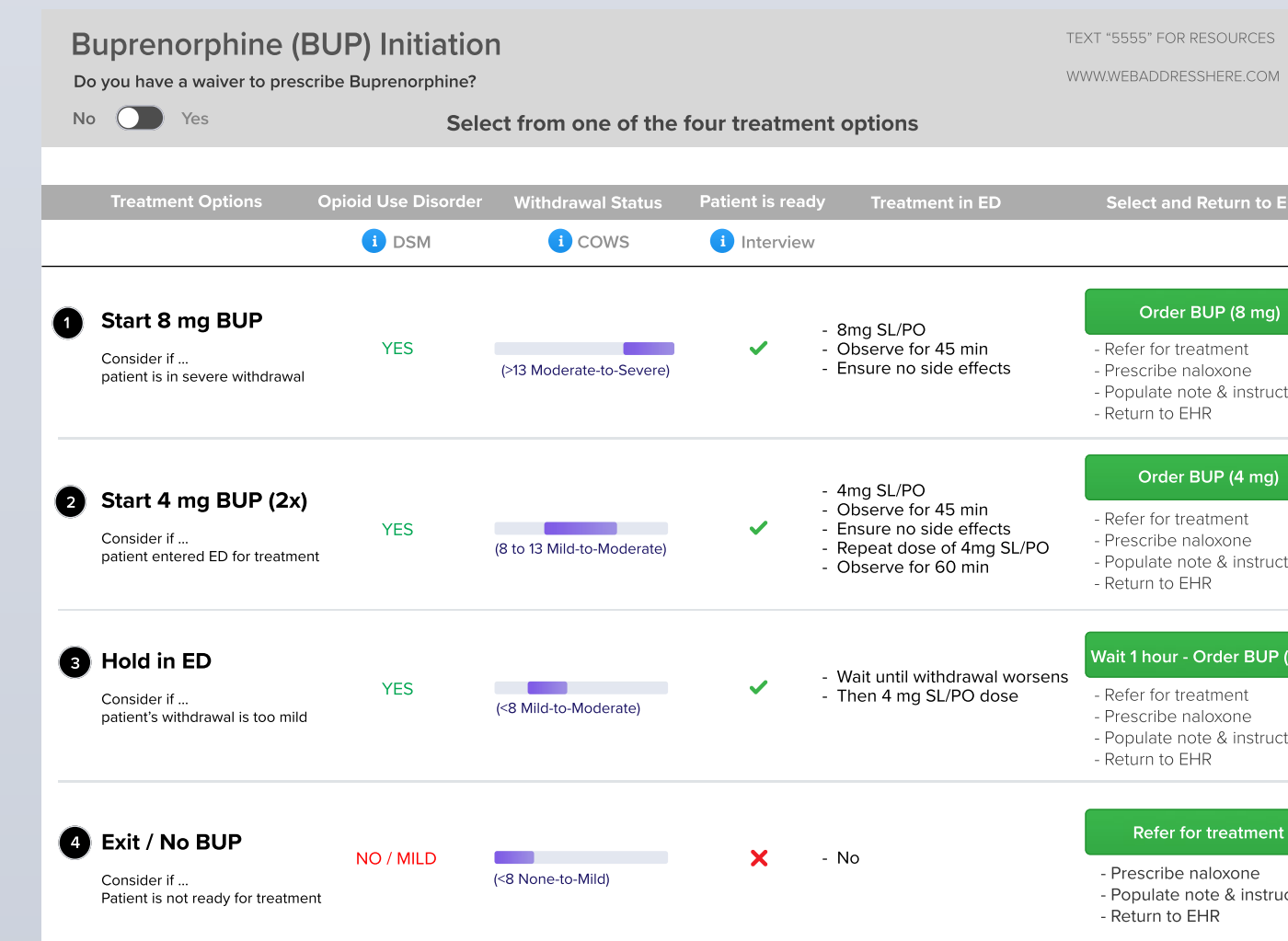
### Iteration 3

#### Design:

- Independent activation of decision support and care pathways
- Single click care pathway
- UCD activation via *i* buttons

#### Feedback:

- Challenges with navigation
- Change labels for decision support



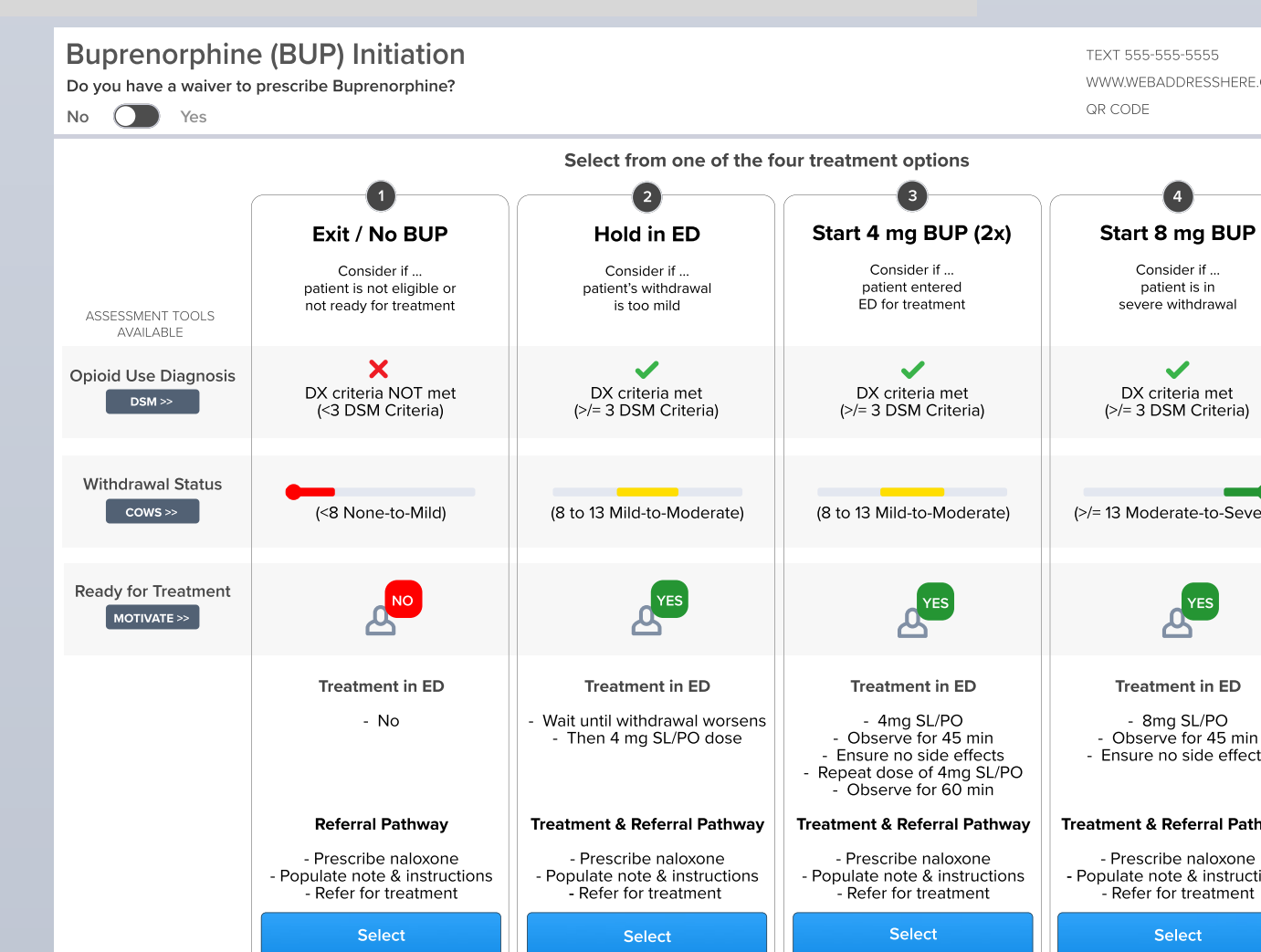
### Iteration 4

#### 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



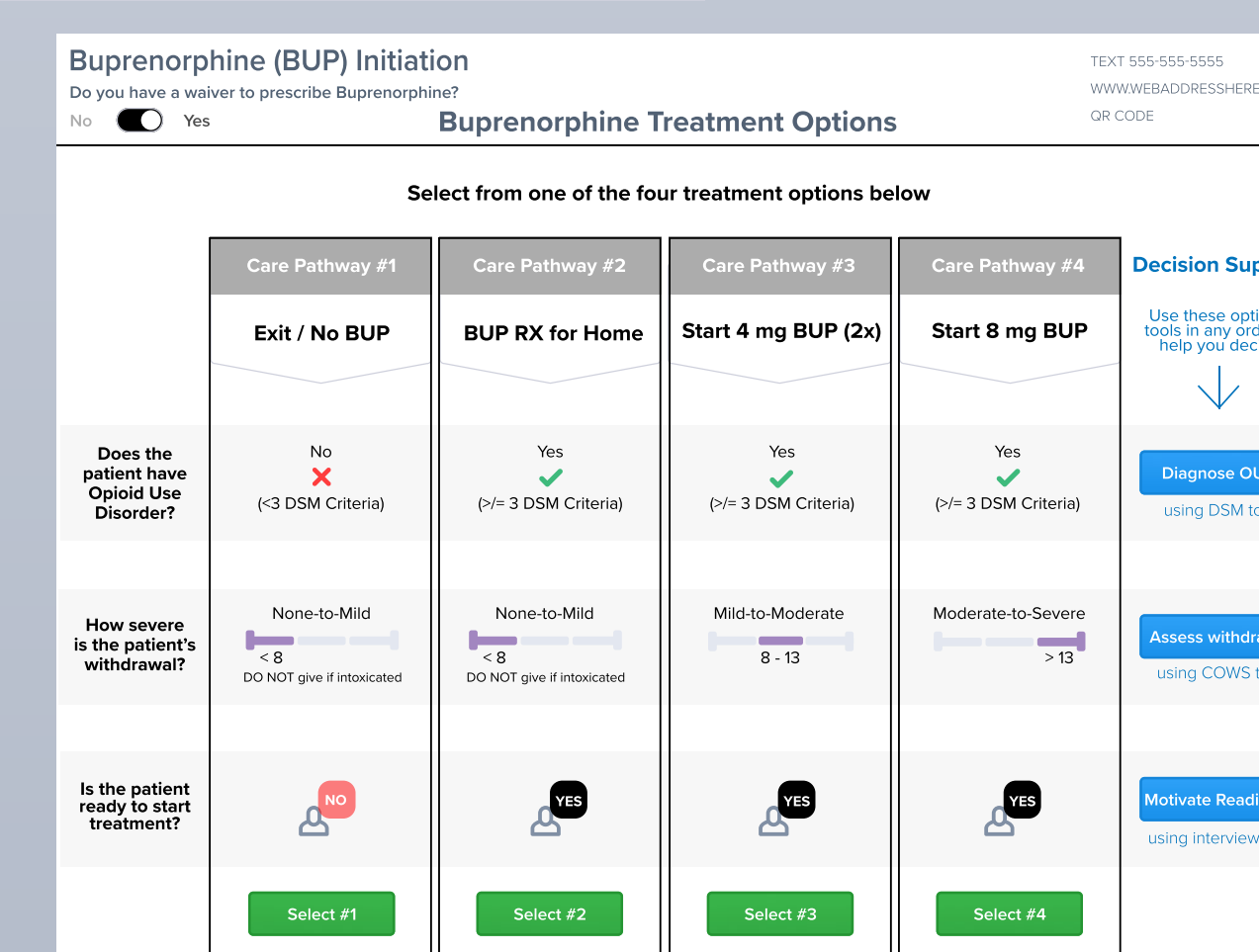
### Iteration 5 - Final Testing

#### 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



## Conclusions

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.

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