

# Patient Response to an Ingestible Biosensor Medication Adherence System

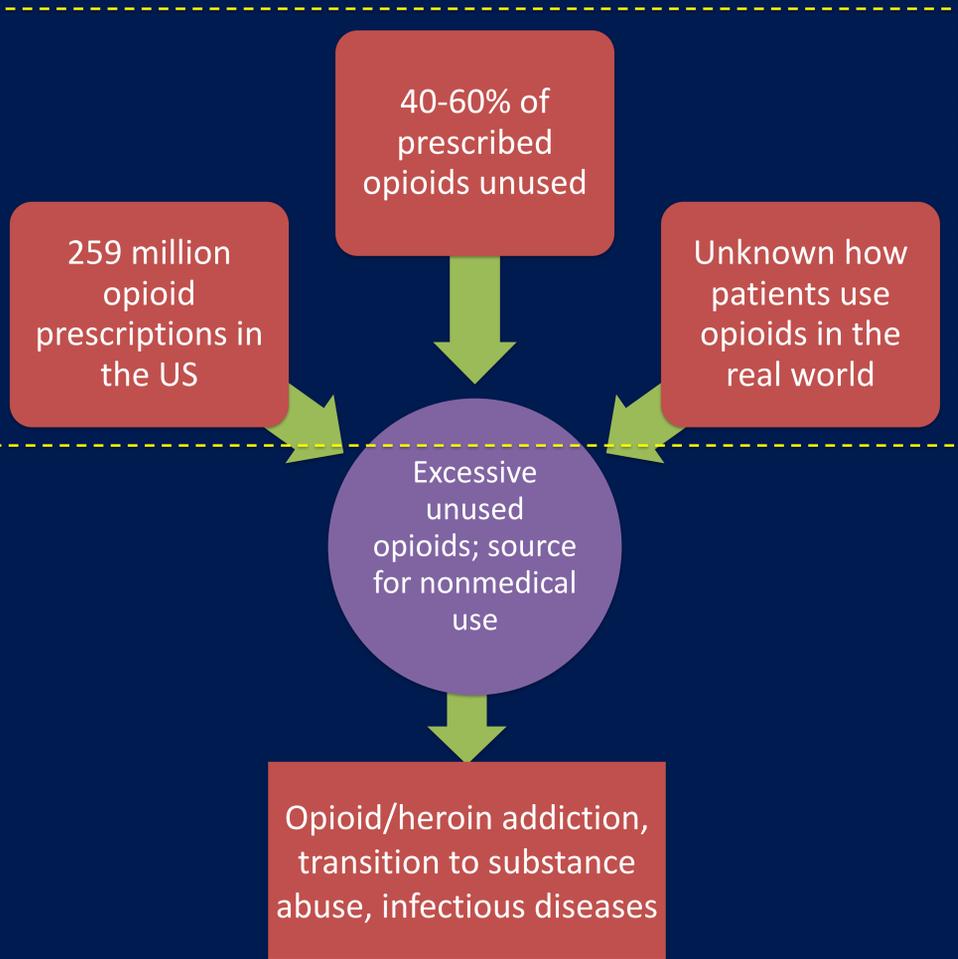
Peter R Chai MD MMS<sup>1</sup>, Brendan Innes BS<sup>3</sup>, Stephanie Carreiro MD<sup>2</sup>, Brittany P Chapman BS<sup>2</sup>, Sae Jin Oh<sup>3</sup>, Theodore Mooncai<sup>3</sup>, Edward W Boyer MD PhD<sup>1</sup>

<sup>1</sup> Division of Medical Toxicology, Department of Emergency Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston MA

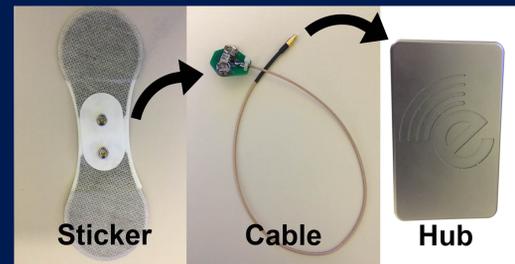
<sup>2</sup> Division of Medical Toxicology, Department of Emergency Medicine, University of Massachusetts Medical School, Worcester MA

<sup>3</sup> University of Massachusetts Medical School, Worcester MA

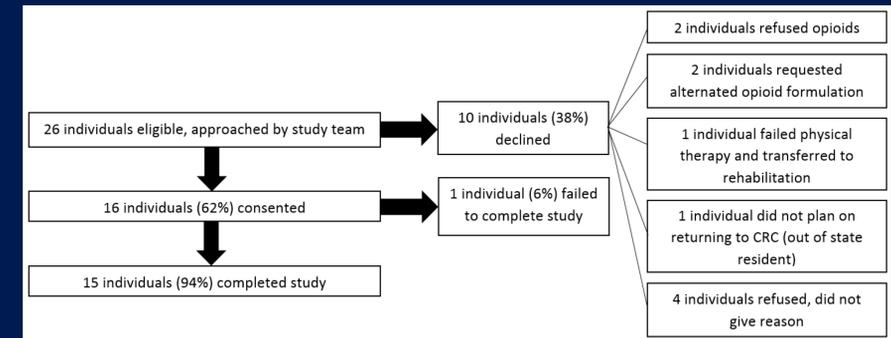
## Background



- Why are we prescribing so many opioids?
- Current methodologies to measure ingestion are suboptimal in opioids.
- What interventions will patients accept?
- How can we understand opioid ingestion patterns, create better guidelines for opioid use?



## Results



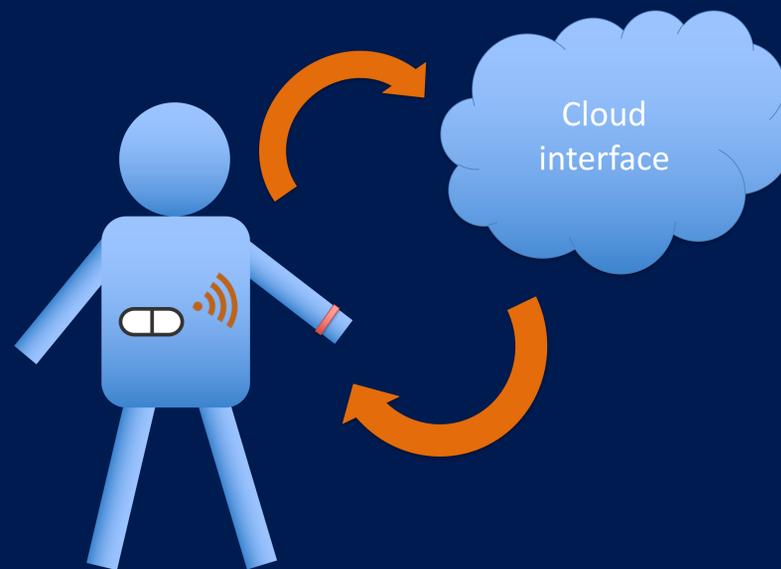
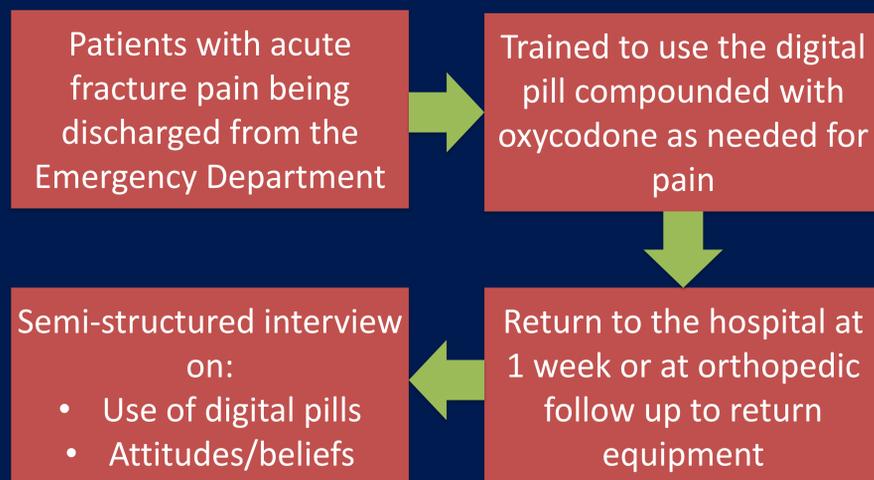
- Recorded 112 ingestion events of 134 possible events (84% accuracy)
- 1 individual did not complete study (pain was too great to operate the digital pill)

Question (N=15)	Agree	Disagree
The digital pill is an acceptable method to monitor opioid ingestion.	15 (100%)	0 (0%)
The digital pill is valuable in remind me to take my medications.	11 (73%)	4 (27%)
Confirmatory text messages helped me recognize the digital pill was working	10 (67%)	5 (33%)
I would prefer text message notifications every time I take a digital pill	9 (60%)	6 (40%)
Increased battery life (>24 hours) would improve the functionality of the digital pill	7 (47%)	8 (53%)

Selected quotes:

- "I thought it was kind of cool. Every time I took my medication I got a message saying that I just took my medication."
- "I liked getting the message though, because it showed me that the device was working."
- "I thought it was easy. And it helped me, because I had a routine of just take that thing off the charger and go get the medicine."

## Methods



## Discussion

- Digital pills can be used to monitor opioid ingestion in patients with acute pain.
- Digital pills are acceptable, and despite the early iteration of technology, are easy to use.
- Emergency Department based training programs to teach patients how to use new technologies are feasible.
- Patients like more frequent text message confirmations to ensure that adherence technology works.

## Conclusion/Future Directions

- Digital pills are acceptable to Emergency Department patients with acute pain. They are easy to operate in real-world settings.
- Acceptance of digital pills in patients with chronic pain, and in outpatient pain management settings need to be assessed.
- Optimal "just-in-time" behavioral interventions in response to real-time ingestion patterns should be developed and assessed.