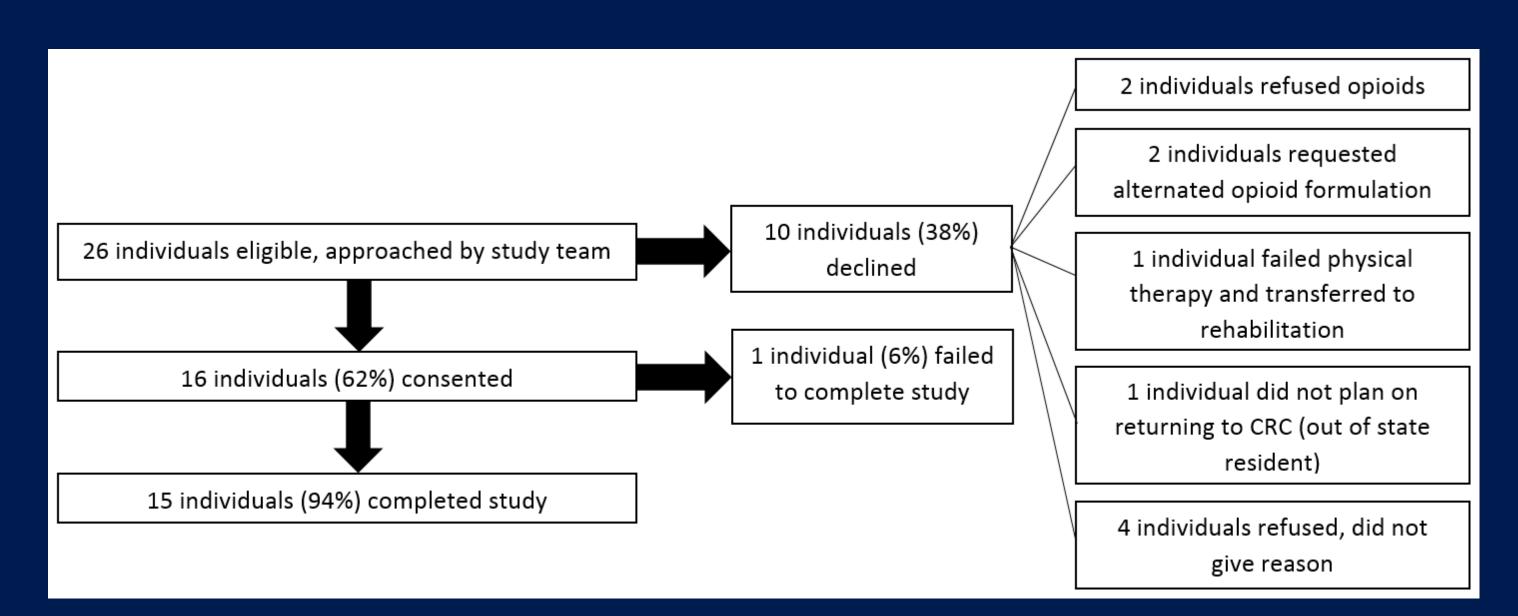
Patient Response to an Ingestible Biosensor Medication Adherence System

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Background 40-60% of prescribed Why are we prescribing so many opioids? opioids unused Current methodologies to measure ingestion are suboptimal in opioids. What interventions will patients accept? 259 million Unknown how How can we understand opioid ingestion patterns, opioid patients use create better guidelines for opioid use? opioids in the prescriptions in real world the US Excessive unused opioids; source for nonmedical use Opioid/heroin addiction, Sticker Cable Hub transition to substance abuse, infectious diseases Methods Cloud Patients with acute Trained to use the digital interface fracture pain being pill compounded with discharged from the oxycodone as needed for **Emergency Department** pain Semi-structured interview Return to the hospital at 1 week or at orthopedic on: Use of digital pills follow up to return Attitudes/beliefs equipment

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

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."

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.



