

# Portable Biosensors to Detect Physiologic Changes in Opioid Use: A Pilot Study

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## Research Question

- Can portable biosensors detect opioid administration?

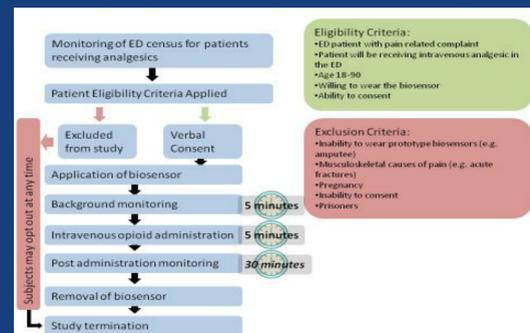
## Background

- Portable biosensors have been used to monitor physiologic variables in natural environments, and have been shown to be useful in the monitoring of cocaine addiction by identifying craving and relapse
- Biosensor technology may provide critical information in opioid addiction and treatment
- There are currently no data on the changes measured by biosensors after opioid exposure

## Methods



Q sensor

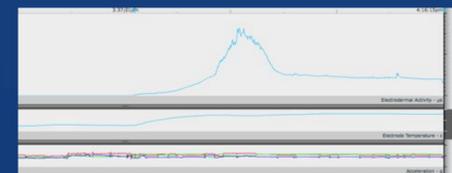


Flow Diagram for enrollment/participation

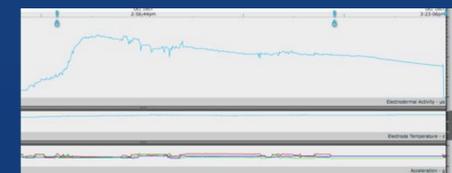
## Results

- 4 patients recruited
- Individual graphs shown below (figures 3-6)
  - Time on horizontal axis; opioid administration delineated by marker along top
  - Graphs from top to bottom: Electrodermal Activity (EDA), skin temperature and locomotion
- Participant Characteristics

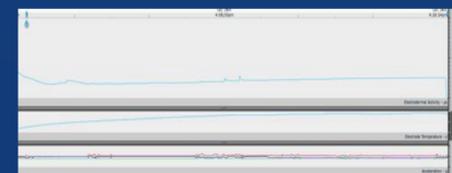
Patient	Handedness	Age	Gender	History of Opioid Use	Intervention	Sensor Wrist	EDA Response	Pain response
1	Right	82	M	opioid naive	4 mg morphine	Left	650% rise	Complete resolution
2	Left	47	M	recent short term opioid use	1 mg hydromorphone	Right	200% rise	Moderate improvement
3	Left	42	F	chronic opioid use	1 mg hydromorphone	Left	no change	No improvement
4	Right	72	M	chronic opioid use	4 mg morphine	Right	70 % rise	Minimal improvement
						Left	55% Rise	



Participant 1



Participant 2



Participant 3



Participant 4

## Discussion

- In this pilot study, opioid injection was associated with a rise in EDA
- Previous opioid use seemed to be associated with a blunted response. In one patient, apparent drug seeking behavior correlated with lack of change in EDA.
- Laterality seemed to be an important factor
- Biometric changes should be further explored as a marker of opioid use in various clinical scenarios.

## Limitation

- Larger application across varying ages, demographics, and range of opioid tolerance will be required to further delineate the expected biometric parameter changes.

## Conclusion

- Changes in EDA occur with administration of opioids, may vary depending on opioid use history and hand dominance, and can be easily measured by portable biosensors.

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