A Technological Solution to Overcome Barriers in Research Participation

Emily Smail, PhD

Department of Health Outcomes and Biomedical Informatics, University of Florida

June 28, 2022

RCCN Workshop “Aging, Race, and Health Disparities”

Agenda

I. Background

II. Introduction to ROAMM Technology

III. Sample Data & Ongoing Projects

IV. Addressing Barriers to Research Participation

V. Conclusions

I. Background

- Traditional research is **conducted in laboratory environments** using surveys that ask participants to recall complex experiences.[1]
- These assessments do not capture **free-living experiences** that often dictate health.

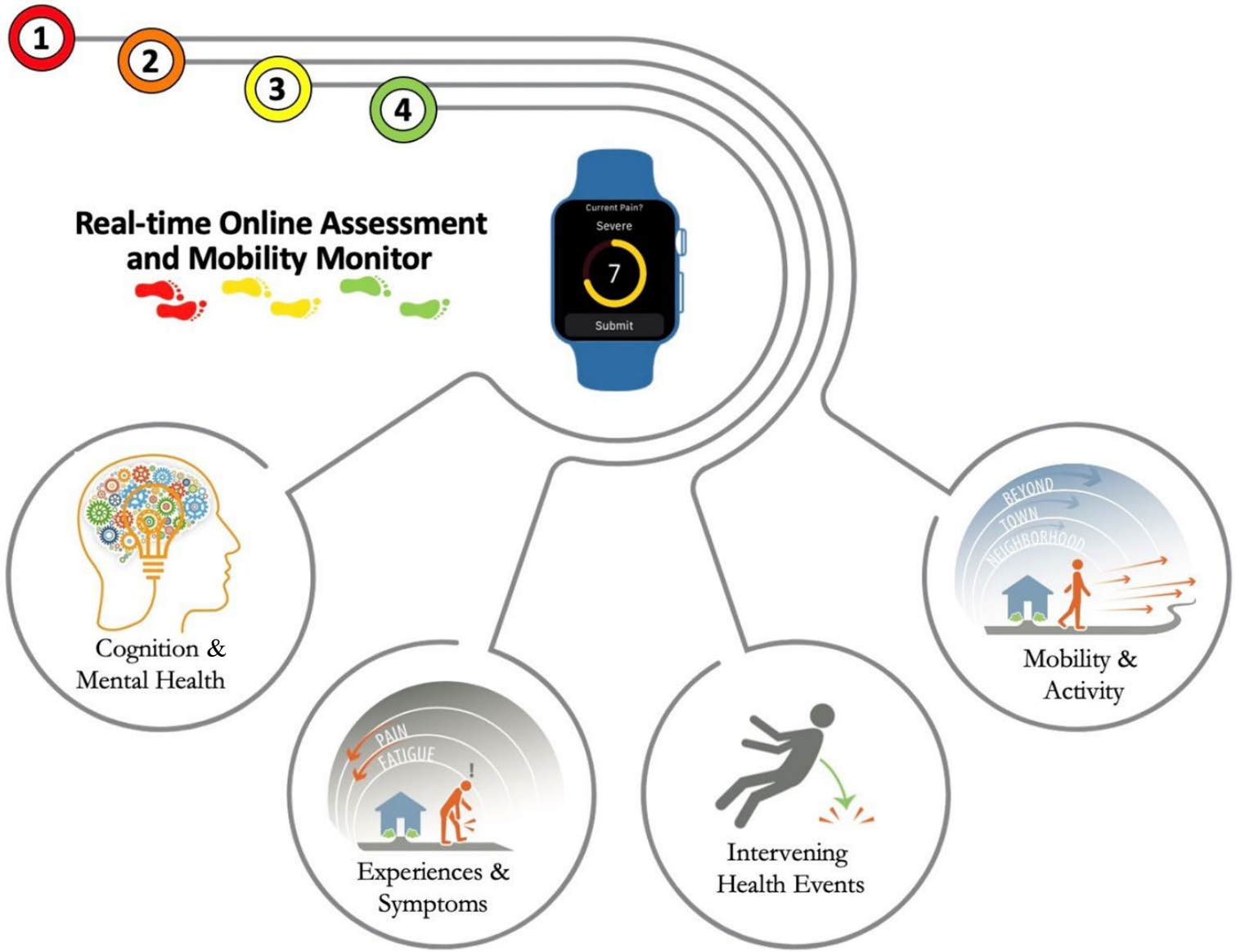
1. Stone, Shiffman, Atienza, Nebeling (2007).

II. Introduction to ROAMM Technology

- Recently, advances in wearable devices allow for data to be customized for research and healthcare purposes.[2,3]
- The Real-time Online Assessment and Mobility Monitor (ROAMM) was designed to utilize smartwatch technology to measure mobility and risk factors for mobility decline.

2. Guk, Han, Lim, Jeong, et al. (2019). **3**. Sharma, Badea, Tiwari, Marty (2021).

Global Domains of ROAMM



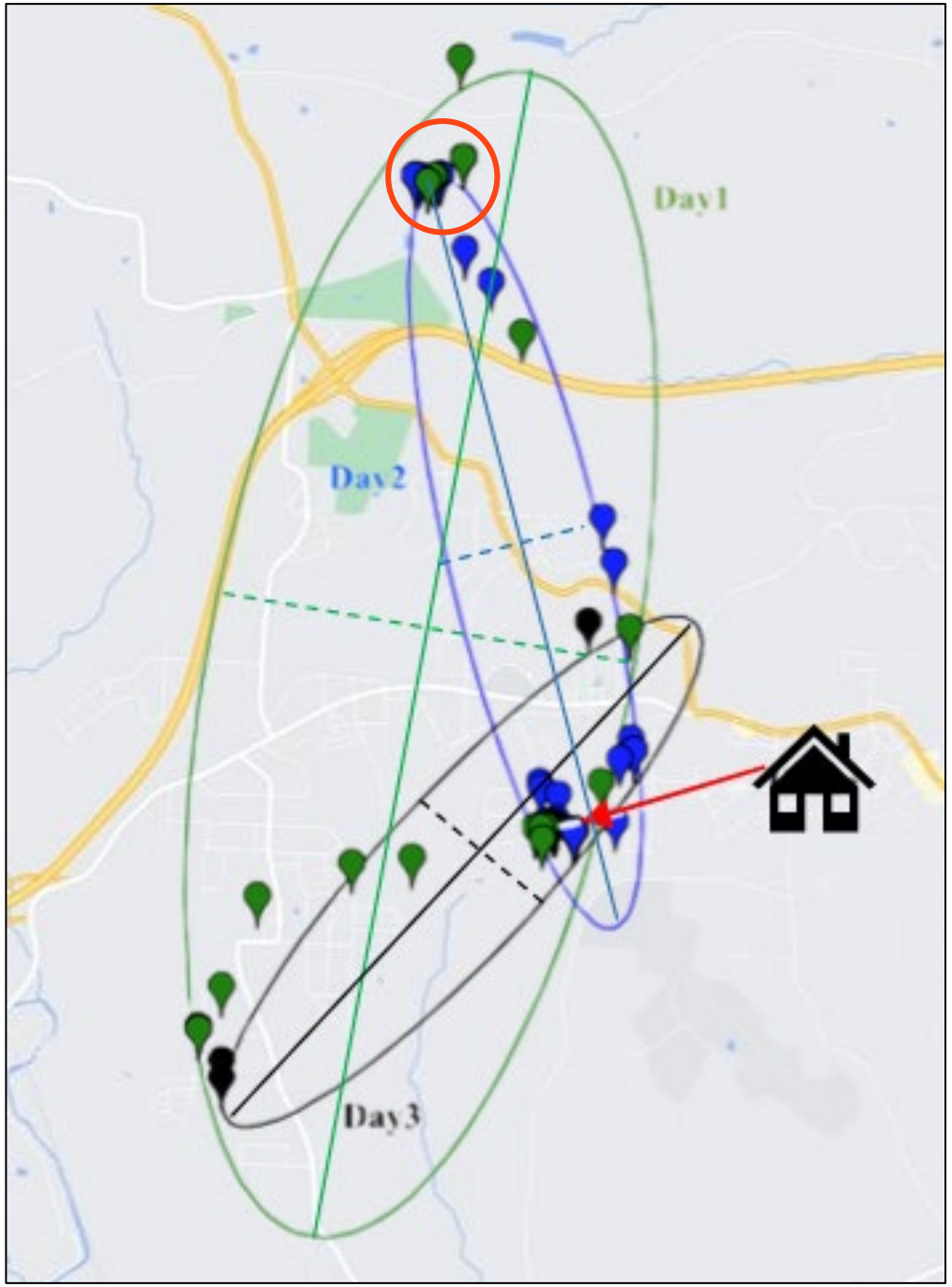
UF College of Medicine
Health Outcomes and Biomedical Informatics
UNIVERSITY of FLORIDA

Sample: Mood

timestamp	question	response_
2021-06-04 20:00:00	Current Mood?	10
2021-05-28 10:00:00	Current Mood?	5
2021-06-07 20:00:00	Current Mood?	8
2021-06-02 10:00:00	Current Mood?	5
2021-05-31 14:00:00	Current Mood?	0
2021-06-02 20:00:00	Current Mood?	0
2021-06-02 14:00:00	Current Mood?	2
2021-06-09 20:00:00	Current Mood?	
2021-06-09 14:00:00	Current Mood?	
2021-05-31 20:00:00	Current Mood?	0
2021-06-07 10:00:00	Current Mood?	7
2021-05-28 14:00:00	Current Mood?	7
2021-05-31 10:00:00	Current Mood?	4
2021-05-28 20:00:00	Current Mood?	3
2021-06-04 10:00:00	Current Mood?	7
2021-06-09 10:00:00	Current Mood?	5
2021-06-04 14:00:00	Current Mood?	0
2021-06-07 14:00:00	Current Mood?	5

Participant-Level	**Group-Level**
Number of Observations	
16	256
Participants (N)	
1	29
Mean	
4	6.8
Standard Deviation	
3.2	2.9

Sample: GPS data



- Data are collected in 15-minute epochs
- Figure shows 3 days of wear
- We can use data to estimate characteristics of life space mobility (e.g., excursion size)

III. Ongoing Projects

Clinical Application: ROAMM-EHR

- Purpose:
  - Feed ROAMM data into electronic health records (EHRs)
  - Test feasibility of ROAMM in patients recovering from surgery
- Hypothesis:
  - Integration will improve post-surgical care management and lead to better mobility and pain outcomes

ROAMM Prospective Cohort

- Purpose:
  - Test feasibility of 1.5-year prospective electronic cohort of older adults
- Hypotheses:
  - Data collected from ROAMM will predict incident IHEs
  - ROAMM can be used to understand recovery trajectories following an IHE

IV. Addressing barriers to research participation

- **Competing demands**: designed to be quick and easy for *minimal participant burden*; costs are covered by the study
- **Unintended outcomes**: risk of adverse event/unexpected outcomes is minimal
- **Mistrust:** devices are multilingual; working with community-based registries and health clinics to recruit minority participants
- **Lack of access to information**: ability to show participants their data in real-time
- **Lack of benefit**: interventions can be tailored to environment and circumstances

V. Conclusions

- ROAMM offers a continuous, long-term connection with participants
- Data offer insight into ecologically-based mobility, related symptoms, and experiences
- The technology has the potential to overcome some often-cited barriers to research participation

Acknowledgements

- Todd Manini & Chris Kaufmann (advisors)
- RCCN Workshop
- NIA Translational Research on Aging and Mobility (TRAM) program (T32AG062728)

ROAMM Investigators

- Sanjay Ranka, PhD
- Todd Manini, PhD
- Parisa Rashidi, PhD
- Roger Fillingim, PhD
- Jordan Alpert, PhD
- Michael Marsiske, PhD
- John Kairalla, PhD
- Tom Gill, MD

ROAMM Software Engineers

- Tona Mendoza Viramontes
- Matthew J. McConnell
- Ruben Zapata

ROAMM Funding Sources

- NIA R21 AG059207
- UF Pepper Center P30AG028740
- UF CTSI UL1TR001427

References

1. Stone Arthur A., Shiffman Saul, Atienza Audie A., and Nebeling Linda, Eds. 2007. The Science of Real-Time Data Capture: Self-Report in Health Research. New York, NY: Oxford University Press.
2. Guk K, Han G, Lim J, Jeong K, Kang T, Lim E-K, et al. Evolution of Wearable Devices with Real-Time Disease Monitoring for Personalized Healthcare. Nanomater Basel Switz. 2019 May 29;9(6):E813.
3. Sharma A, Badea M, Tiwari S, Marty JL. Wearable Biosensors: An Alternative and Practical Approach in Healthcare and Disease Monitoring. Molecules. 2021 Feb 1;26(3):748.

Questions?