

Remote Digital Monitoring to Detect Behavioral and Neuropsychiatric Symptoms in Alzheimer's Disease

PI: Emma Rhodes, PhD



The Problem

- Alzheimer's disease is more than memory loss
- Behavioral symptoms are complex and understudied
- Traditional measurement of behavior is flawed
 - Indirect
 - Subjective
 - Decontextualized
 - Relies on overburdened caregivers
- Limited understanding of mechanisms and treatments



The Impact

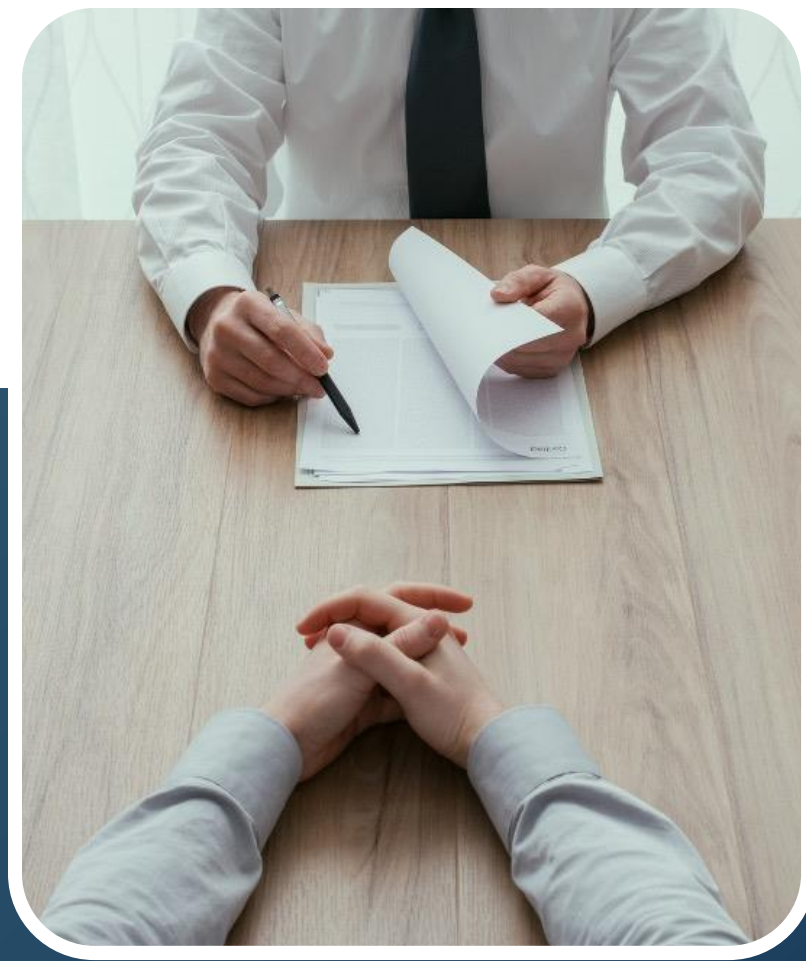
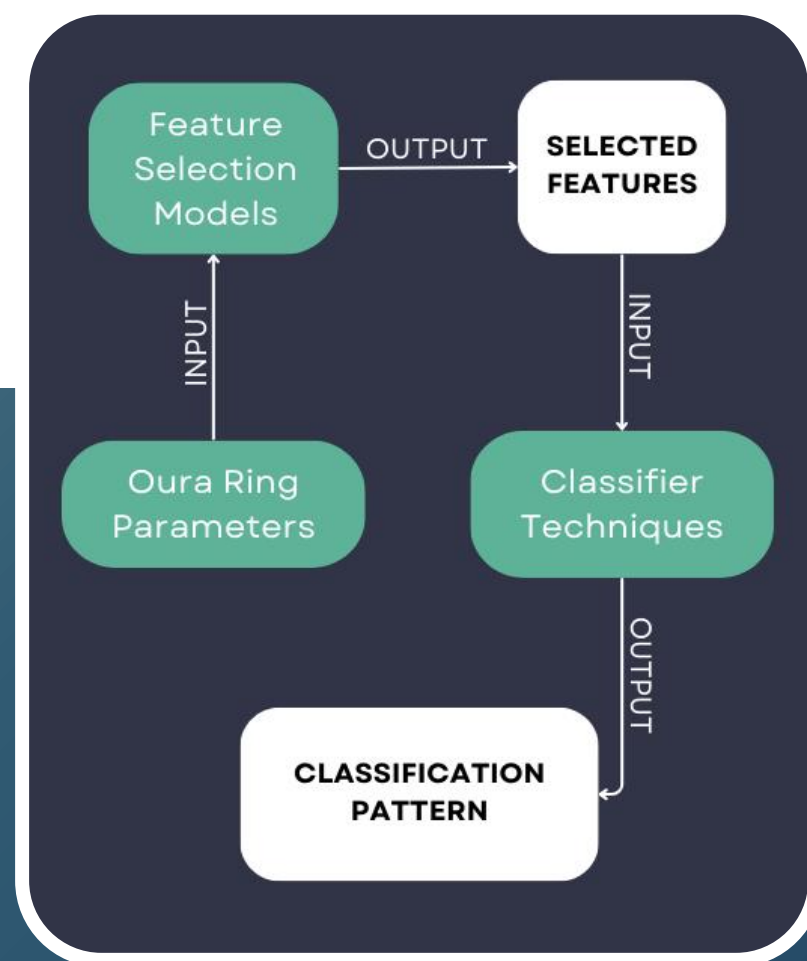
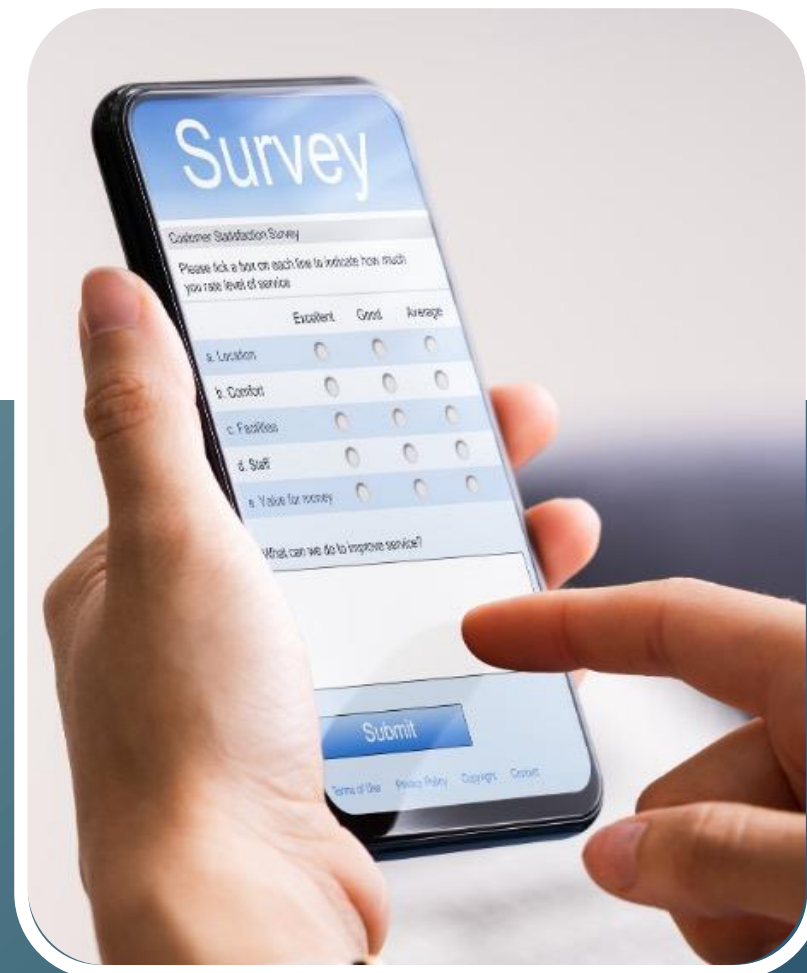
- Over 90% of patients will develop ≥ 1 behavioral symptom
- Predict functional decline above and beyond cognition
- Increase burden and distress in family caregivers
- Lead to costly hospitalizations and nursing care

Annual Healthcare Costs	With behavioral symptoms	\$63,268
	Without	\$33,383

Our Solution:

Scalable Digital Biomarkers of Behavior

- 1 Digitally monitor participants with Oura rings
- 2 Log behaviors, caregiver stress, and activities with daily smartphone diaries
- 3 Identify digital biomarkers with machine learning
- 4 Assess acceptability and user experience with interviews



Study Team



Emma Rhodes, PhD

Neuropsychologist and
Primary Investigator

University of Pennsylvania

Expertise:
Digital monitoring of
behavior in dementia



Jason Karlawish, MD

Geriatrician and Co-Director,
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Expertise:
Bioethics of Alzheimer's
disease research



Virginia Sturm, PhD

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Expertise:
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Neuropsychologist

University of California
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Expertise:
Remote wearables research
in aging and dementia

Study Goals

- **Develop digital biomarkers of behavior in Alzheimer's disease**
 - Scalable
 - Contextualized
- **Identify predictive risk factors for future behavioral symptoms**
 - Individual
 - Environmental



THANK YOU

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