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

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<th>With behavioral symptoms</th>
<th>Without</th>
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| $63,268            | $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, Penn Memory Center
University of Pennsylvania

Expertise:
Bioethics of Alzheimer's disease research

Virginia Sturm, PhD
Affective Neuroscientist
University of California San Francisco

Expertise:
Psychophysiologic monitoring of emotion

Kaitlin Casaletto, PhD
Neuropsychologist
University of California San Francisco

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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