

careband

**Empowering people living with  
dementia to stay safe and out of  
the hospital**

Adam Sobol - Founder & CEO



“Dementia care requires high  
quality and well integrated medical  
and social services”  
- NIH.gov

# Agenda

## 1. CareBand Story

- a. What is CareBand
- b. How does CareBand work

## 2. Research Studies

- a. Detecting Agitation
- b. Monitoring Social and Activity Engagement
- c. Understanding Decline Through Lifespace

## 3. Aging in Place with Amazon

- a. What is Amazon Sidewalk
- b. CareBand + Amazon Sidewalk
- c. Creating Neighborhood Safety Nets

## 4. The Opportunity

# Our Story



## Our Mission

- **Autonomy**  
People with dementia want, and still can, make decisions and do things on their own.
- **Release mental burden**  
Change care partner's mindset from taking care of another person's life to giving that person support.
- **Feel needed**  
It's important to maintain the sense of being needed through social connections.
- **Remove label**  
Don't call people with dementia "patient", don't label them.
- **Support**  
Let people with dementia feel supported by our product design.

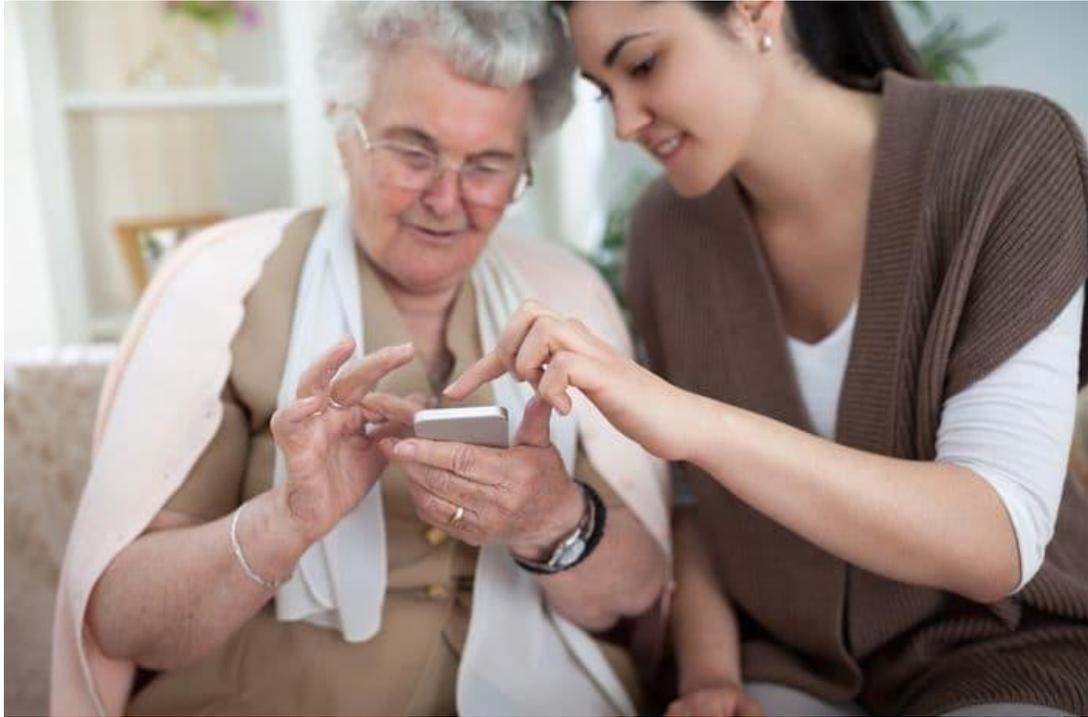


## CareBand as a Care Partner

- Founded in 2016
- HQ in Chicago, IL
- 4 granted patents, 3 pending
- Based on years of R&D with technology and medical experts including the National Institutes of Health (NIH) and University-based research
- Team combines 30+ years of expertise in low power wireless embedded systems, cybersecurity, and healthcare



## Design and Technical Constraints



1. Older adults may not know how to use a smartphone or even have WIFI
2. Ability to set up a system quickly, easily, and without complexity
3. Allows for devices to have a long battery life

# Our secret sauce is our long-range, affordable connectivity

## 1 Gateway

- Can reach at least 1 mile
- Provide connectivity for 1,000 devices
- Only costs \$300



Small amounts of data + long range

CareBand LoRaWAN  
Network  
1+ mile

Public network  
partners with  
coverage in major  
cities

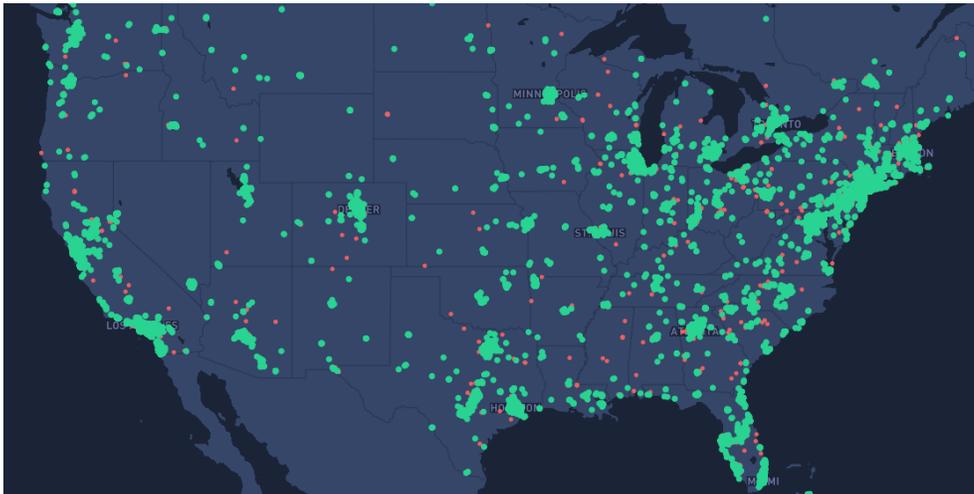
WiFi  
< 150 ft

Limited to  
indoors

Bluetooth  
< 30 feet

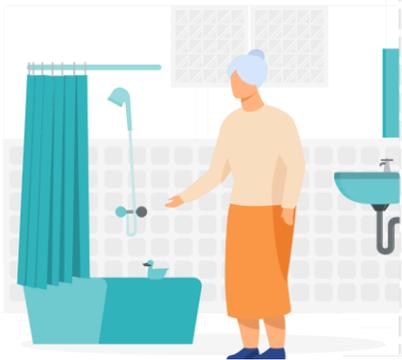
Must connect to a  
smartphone

## SUPPORTED BY



# Delivering location + activity & behavior detection

Room level tracking



Indoor location tracking



Wander event started

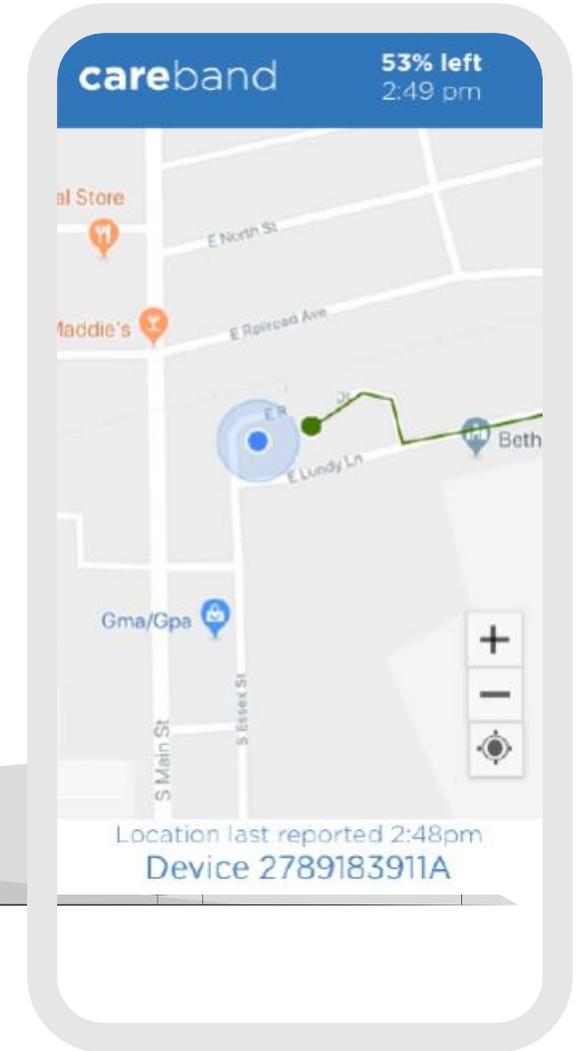


Outdoor location tracking



**Machine Learning**  
captures activities  
of daily living

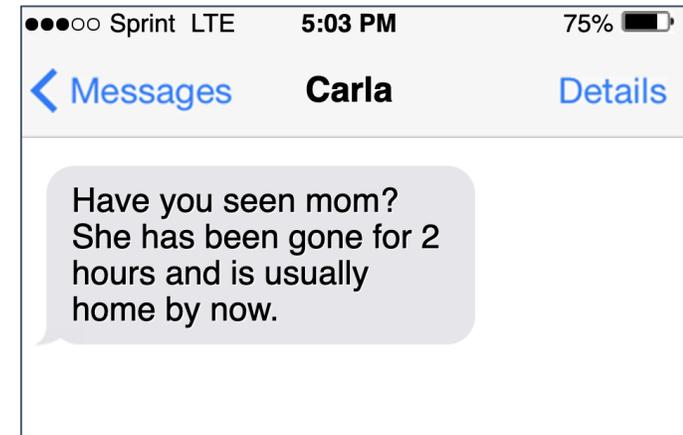
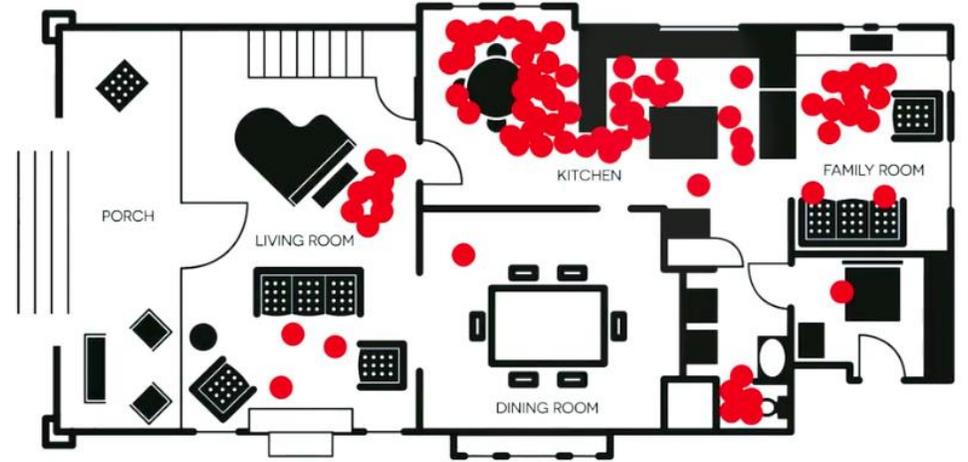
**Notifications**  
to caregivers  
alert wandering





## Safety through the understanding patterns

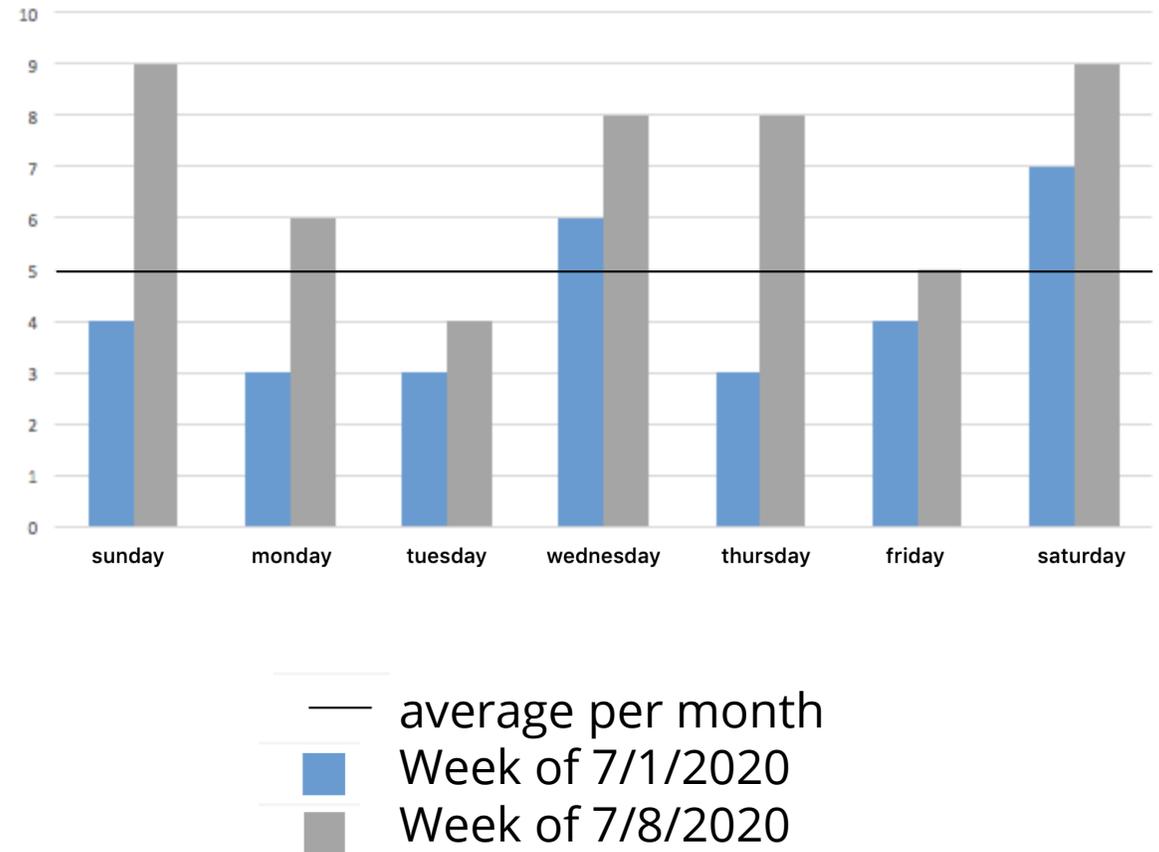
- Know where someone is and where they have been inside a house
- Understand activities of daily living
- Monitor sleep, exercise, and sedentary behavior
- Know when wandering occurs based on irregular pattern



## Health between the days

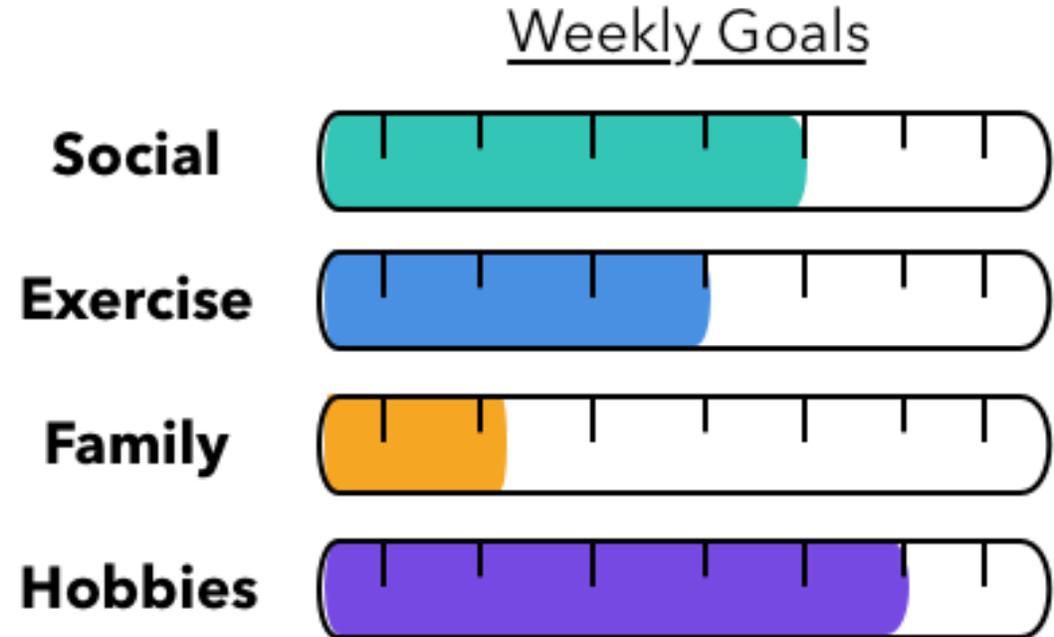
- Objective 24/7 passive monitoring
- Notice changes in behavior patterns which could lead to infections
- Communication of early changes to family, or caregivers
- Understand a baseline routine and provide feedback to support it
- Continued use of brain through hobbies, learning new things, trying new experiences and challenging self

BATHROOM VISITS PER DAY



## Happiness with independence and purpose

- Measure social interaction
- Track goals and provide feedback
- Engage in meaningful activities in and out of the house
- Have confidence to take a walk alone
- Measure lifespan



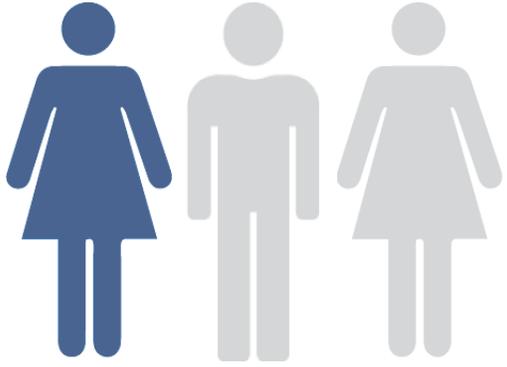
# Research Studies Enable Us to

1. Validate outcomes based on accumulation of accurate location data & activity patterns
1. Use data metrics to assist in monitoring symptoms & measuring clinical outcomes

**CareBand research is dedicated to improving the lives of those with Alzheimer's Disease and related dementias (ADRD) by conducting evidence-based research to obtain measurable clinical outcomes.**



## Building a world without Dementia



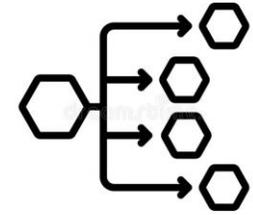
1

CareBand  
Users



2

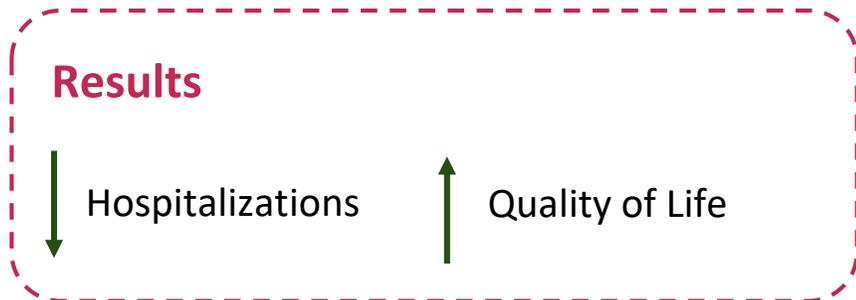
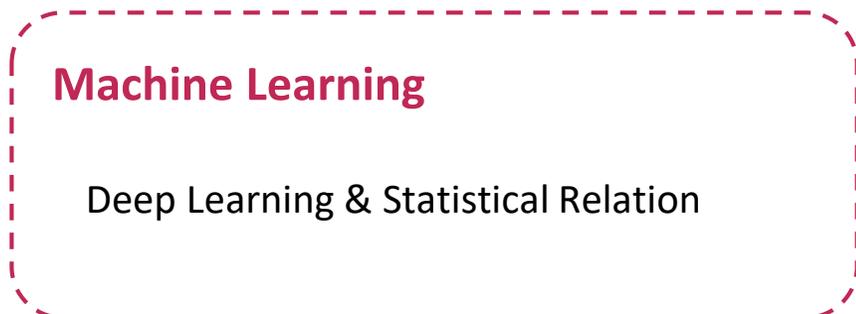
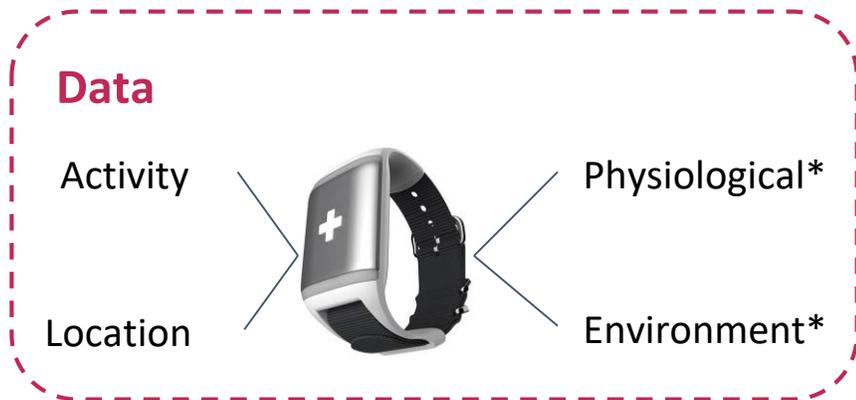
Research  
Studies



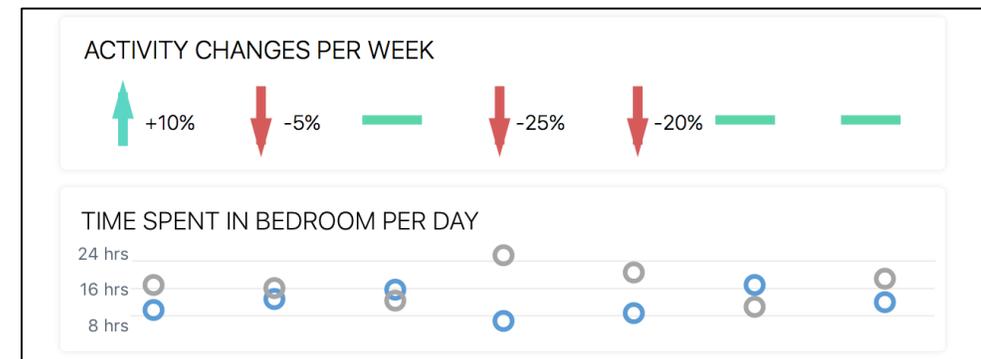
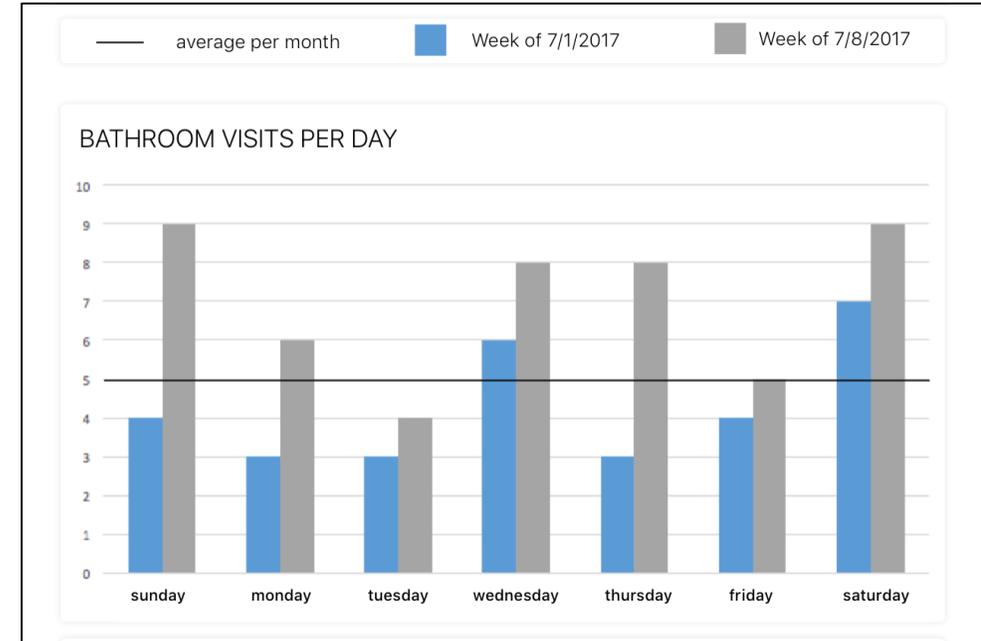
3

Consent,  
Scale &  
Distribution

# Proprietary Data Can Identify Changes Early



\*not in current model



# Detecting Neuropsychiatric Symptoms of Dementia



- Understanding and monitoring of behavioral symptoms
  - Identification of digital biomarkers & early signs of ADRD
- Research Questions:
  - Can CareBand detect agitation?
  - Can CareBand measure engagement?
  - Can CareBand measure lifespaces among people with dementia?
- Proactive interventions to help person with dementia



National Institutes  
of Health  
SBIR/STTR

IU NIA SBIR  
Agitation



CSU Detecting  
Social and Activity  
Engagement



UMN Measuring  
Lifespaces

## UNDERSTANDING THE SOCIOBEHAVIORAL EXPERIENCE OF DEMENTIA

Behavioral phenotype

Physical environment

Social determinants of health

Caregiver/individual factors



## MONITORING NEUROPSYCHIATRIC SIGNS/SYMPTOMS OF COMMON CONDITIONS

Agitation

Apathy

Appetite/eating disorders

Anxiety & depression

...not an exhaustive list



## CLINICAL DECISION SUPPORT TOOL

Integrates to EMR

Communicates to caregivers & clinicians

Reports changes indicative of acute health condition

Monitor changes in cognitive ability



# Incorporating Social Determinants of Health to Design Meaningful Health Technology

- Understand the sociocultural and environmental context of person with dementia and caregiver
- Build findings into the experience of CareBand
- Research Question: How can CareBand technology be used to address the health needs of those in underserved areas?



UMN Center for Community Engaged Rural Dementia and Alzheimer's Research (CERDAR)

UMN Memory Keepers: Peace of Mind for Indigenous Communities

Journal of Rehabilitation and Assistive Technologies Engineering

**Peace of mind: A community-industry-academic partnership to adapt dementia technology for Anishinaabe communities on Manitoulin Island**

Kristen Jacklin, Karen Pitawanakwat, Melissa Blind, more... [Show all authors](#)

First Published September 16, 2020 | Research Article | [Check for updates](#)

<https://doi.org/10.1177/2055668320958327>

Article information

Abstract

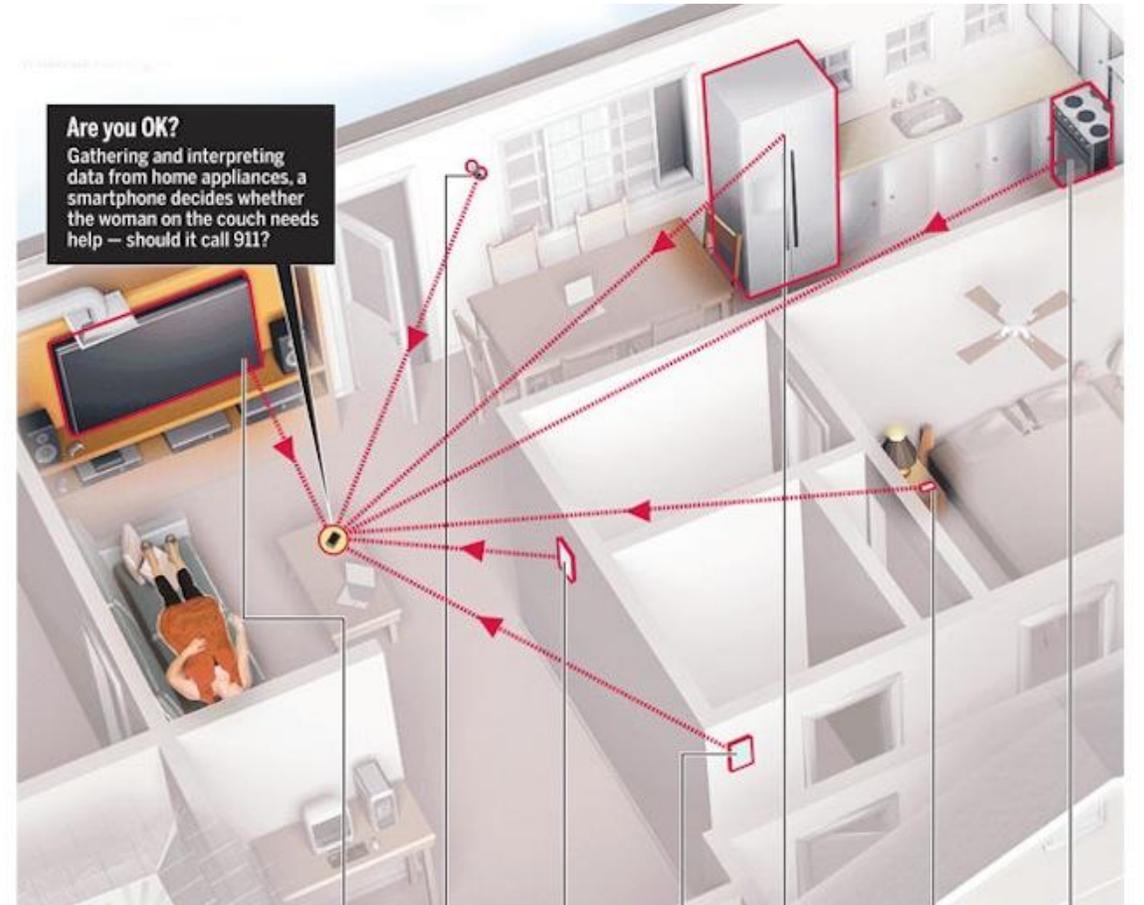
Introduction

Aging Technologies for Indigenous Communities in Ontario (ATICON) explores the technology needs

# **Aging in Place with Amazon**

## The Smart Home is Not New, so what has changed?

- People are more open to sensors in the home or wearables
- Standards like bluetooth and LoRa have been established to support interoperability
- Technology is cost effective for a majority of older adults



### How appliances could save a life

Experts say smart gadgets will one day sense whether people need help and automatically assist them. How a system would work using a smartphone and smart appliances.

- |  |  |  |  |   |   |   |
|--|--|--|--|---|---|---|
| <b>1 TV</b><br>She isn't getting up to watch her favorite television show. | <b>2 Security camera</b><br>She might be sleeping, but she hasn't moved in 24 hours. | <b>3 Audio sensor</b><br>She sounded weak and disoriented yesterday. | <b>4 Motion sensor</b><br>She's been walking slower the past few days. | <b>5 Refrigerator</b><br>She hasn't eaten well for weeks. | <b>6 Pill box</b><br>She stopped taking her medications two days ago. | <b>7 Stove</b><br>She left one of the burners on. |
|--|--|--|--|---|---|---|

### What an appliance or gadget could detect

Source: Mercury News reporting

ANDRÉA MASCHIETTO AND DOUG GRISWOLD/MERCURY NEWS

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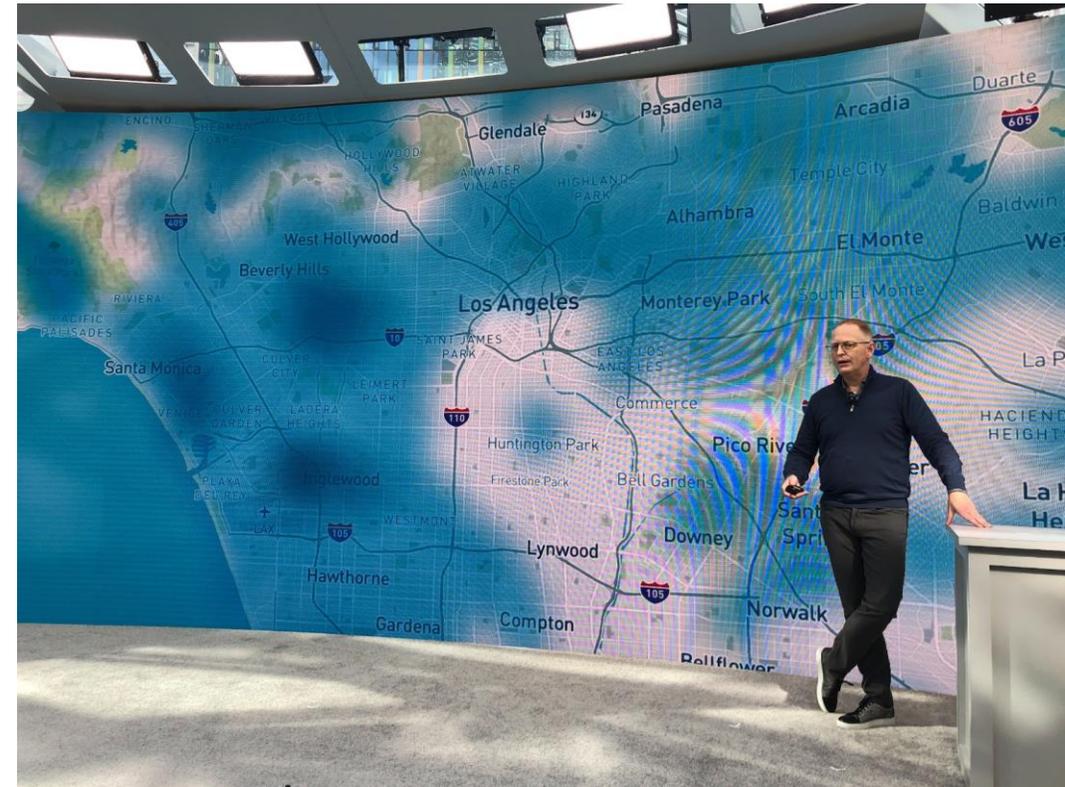
# The Race to the Smart Home & Beyond



# Amazon Sidewalk Partners with CareBand to Support Older Adults at HOME



A single Amazon Echo has a up to one mile range!



Network coverage in LA alone!

# Creating Neighborhood Safety Nets



## Home

**How did mom sleep?**

**Is mom acting strange?**

**Did mom fall?**

## Neighborhood

**Did mom take her walk today?**

**Where is mom now?**

**Did mom go to Church this week?**

# The Opportunity is Now



50 million  
2020

150 million  
2050

GLOBAL COST OF  
DEMENTIA 2020  
\$1 TRILLION USD

CareBand was intentionally designed to empower people living with dementia with a location-based health and safety wearable solution.

Research studies with leading universities and government agencies validate the efficacy of the CareBand solution.

With Amazon Sidewalk, CareBand is starting to enable people living with dementia at home to age in place.



**careband**

# Questions?

**For more information, please contact:**

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**[www.carebandremembers.com](http://www.carebandremembers.com)**