

eHome *i*Care: Supporting Caregivers with Technologies

TVN MindMerge
University of Victoria
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Overview



- **eHome *i*Care**
 - Research team
 - Partners
- **Home care context**
 - Client profile
 - Care gap
- **Current Projects**
 - Framework
 - Analytics
- **Conclusions**

eHome iCare Team



- **Debra Sheets, Ph.D., MN, FAAN** ■ geriatric nursing, caregivers
- **Cheryl Beach, Ph.D., PT** dementia, technologies, homecare
- **Stuart MacDonald, Ph.D.,** neuropsychology, cognitive decline
- **Sandra Hundza, Ph.D., PT** neuromechanics of mobility decline
- **Andrew Mitz, Ph.D.,** neurophysiology
- **Carl Asche, Ph.D.** health economic & outcomes
- **Marc Klimstra, Ph.D.** biomechanics of gait
- **Yvonne Coady, Ph.D.** computer science. "big data" analytics

eHome iCare Partners



- **Island Health**
 - Home & Community Care
- **Office of Seniors Advocate**
(Voice of seniors and RAI analytics)
- **University of Victoria**
 - CanAssist
- **SimpleC**
 - Companion
- **IBM**
 - Watson
 - Big data
- **TELUS**
 - TELUS Health
- **Jintronic** (Kinect)
- **X-IMU** (inertial sensors)
- **CareLink Advantage**

eHome iCare



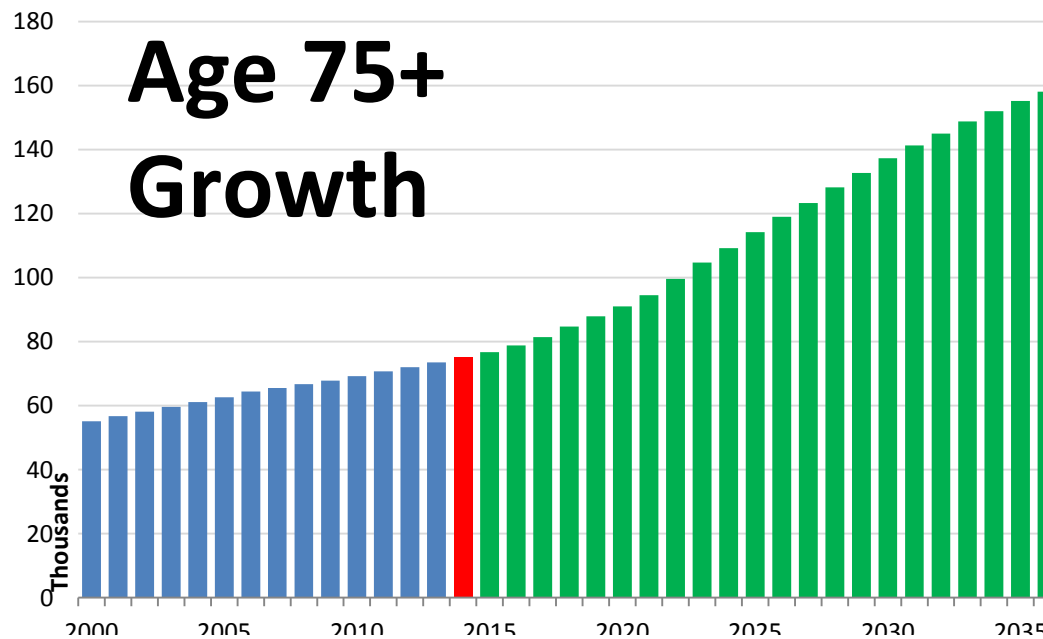
Our vision is to develop a suite of technologies that **goes beyond monitoring** and alerting caregivers. We want to also be able to:

- **Predict** when significant changes are likely to occur allowing for earlier assessment
- **Prevent/Intervene** to reduce adverse events.

Island Health



65+ : 14% to 25% (2014-2020)



Acute Care

Home Care

Residential Care

Supporting Clients & Family at Home

Home & Community Care Clients




2014	Island Health
<i>Number</i>	6,246
Average Age	82
Assistance with ADL (ADLs 1+)	42%
Moderate Cognitive Impairment (CPS 3+)	22%
Signs of Depression (DRS 3+)	18%
Alzheimer's or dementia	40%
Fell last 90 days	38%
Live alone	47%
Dementia and live alone	14%

Home & Community Care Clients



2014	Island Health
Caregiver distress, anger, depression	38%
2+ hospital stays last 90 days	4%
2+ Emergency visits last 90 days	6%
Risk of adverse events (MAPLe):	
High, Very High (4)	56%
Behaviours (e.g. wandering)	18%

Family Caregivers

- 8.1 million Canadians, 28% are caregivers of a chronically ill, disabled or aging family member or friend
 - Caregivers have higher levels of stress and poorer health
- Increasing complexity of chronic care
- Financial impact on family caregivers
- Family caregiver support ratio is 

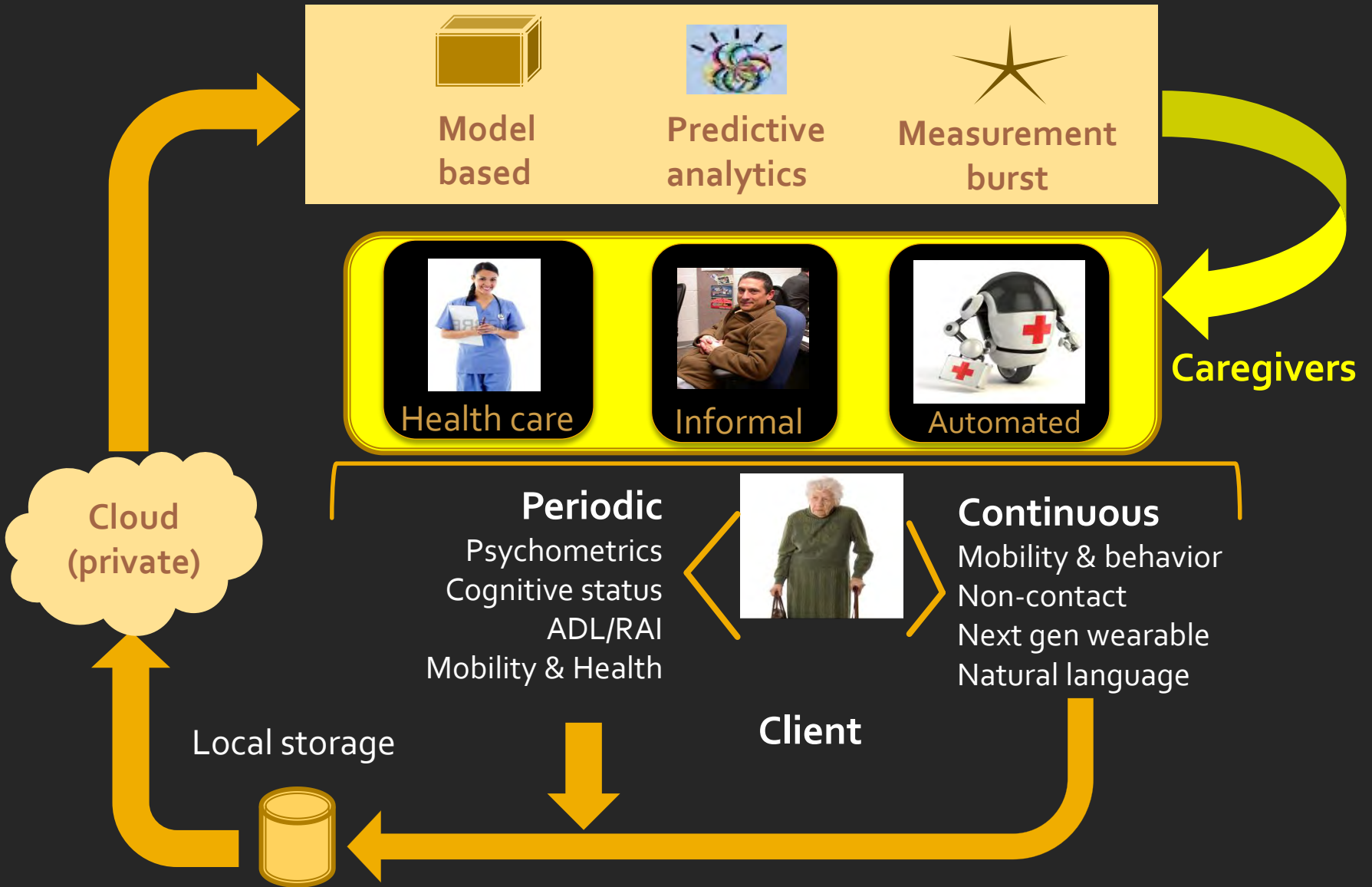
(Redfoot et al, 2013)

The Care Gap

- 8% of Canadians (2.2 million) received help or care at home
- Unmet needs: 461,000 Canadians needed help or care that they didn't receive.
- Partially met: 331,000 did not receive all the help they needed.
- Technology can fill the Care Gap *if*:
 - Caregiver friendly
 - Affordable
 - Accessible
 - Effective

Technologies in Home Care

Technology Model for Home Care



Current Projects

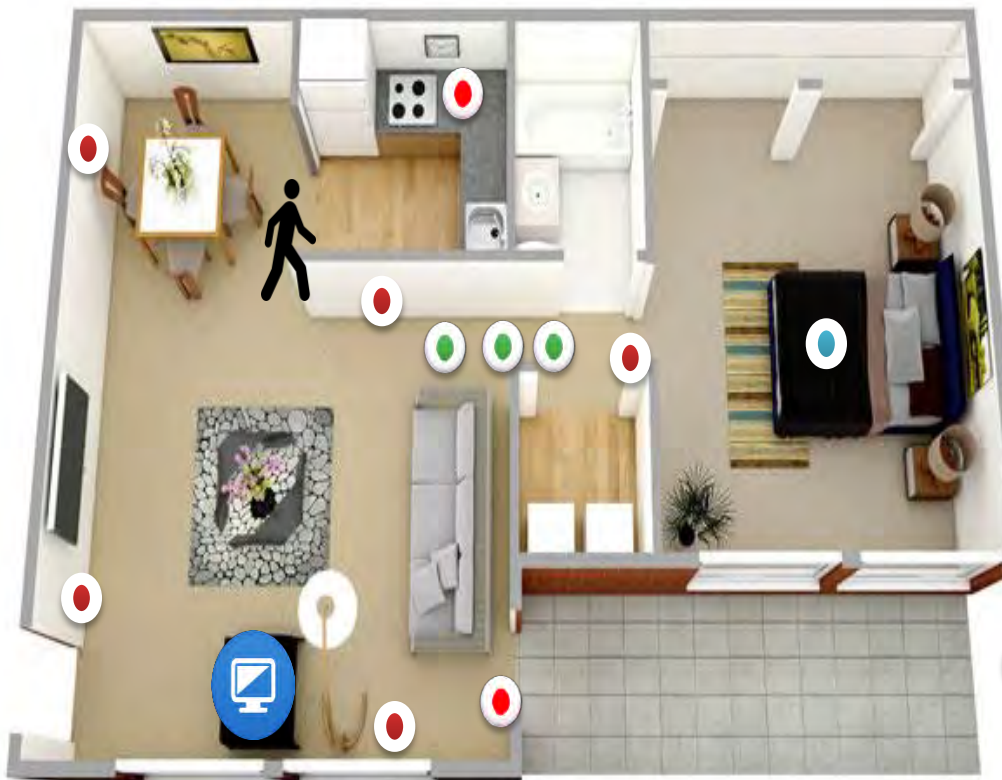
Technology Supports for Community-Dwelling Older Adults with Dementia and Family Caregivers

- **Purpose:** Identify knowledge, attitudes and perceptions towards use of technology in home care
- **Sample:** home care clinicians (n=47)
- **Methods:** online survey
- **Findings**
 - Useful technologies: personal response, reminders, motion sensors, GPS
 - Benefits of use: earlier hospital discharge, live longer at home
 - Barriers to use: need cost subsidies, family available to respond to alerts
- **Next steps:** Family caregiver and client interviews







Modeling Changes in Mobility, Cognition and Daily Activities to Predict Care Needs (2015-2016)

- **Purpose:** integrates data from multiple sensors to provide a more predictive metric for adverse events or changes in health status
- **Sample:** community dwelling older adults living with cognitive impairment
- **Methods:** continuous and intermittent data across domains of health (e.g. daily activities, mobility, sleep)
- **Stages:**
 - Pilot test in lab: develop metrics
 - Proof of concept: 4 home care clients

Integrated Technology Network



Sensors

-  **Bed Pressure**
-  **Activity Sensor**
-  **Computer**
-  **Gait Sensors (e.g. Infrared sensors)**
-  **Inertial Motion Sensor**
-  **Environmental Sensors (e.g. Contact Sensors)**



Effector

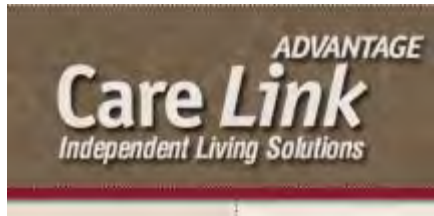
SimpleC Companion



During key times throughout the day, the Companion delivers scheduling reminders for activities, mealtimes as well as behavioral interventions for under stimulation, sundowning and agitation – all without the use of medications.

Effector

Island Health Wandering Deterrent

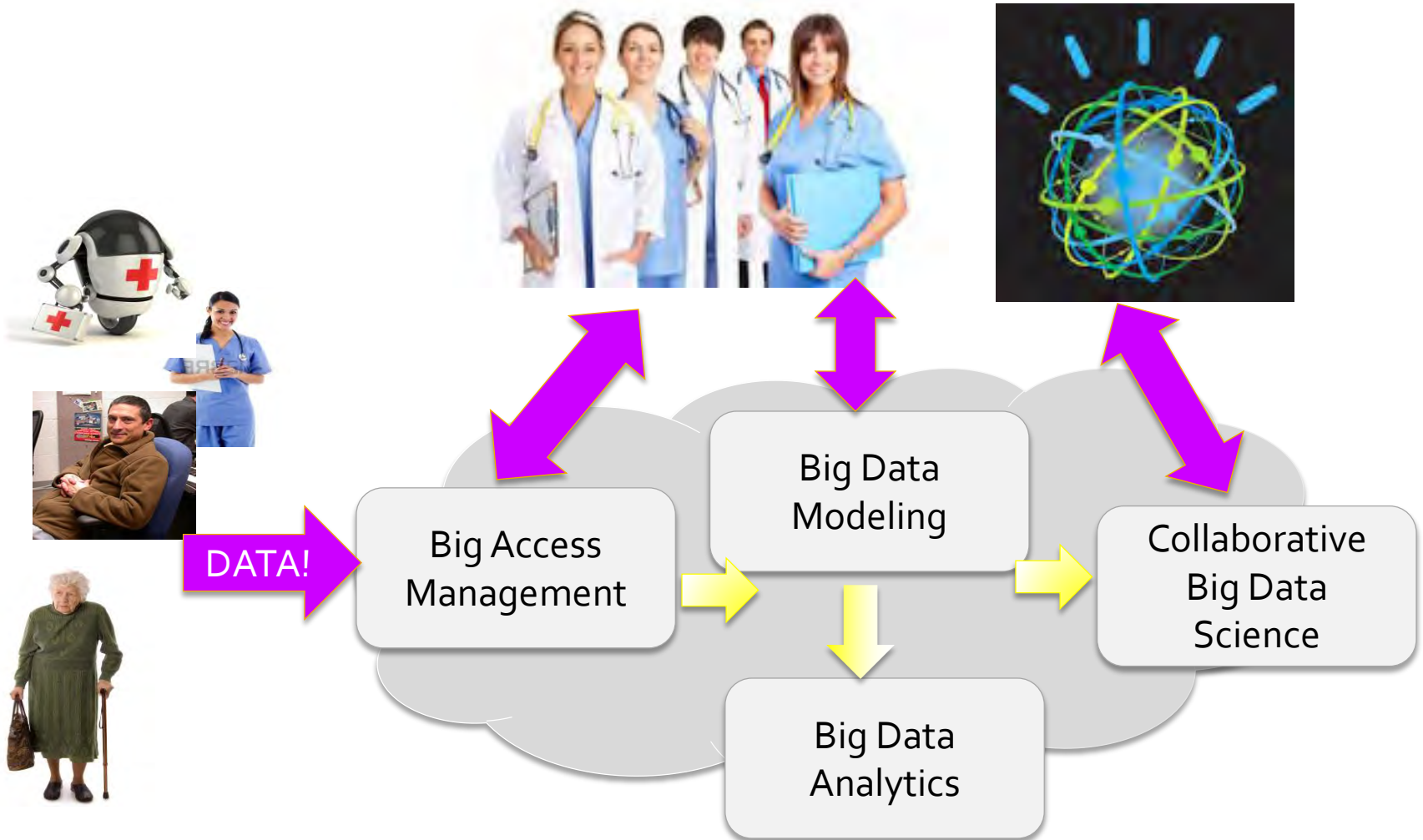


CanAssist Collaboration



University
of Victoria

Big Data and Analytics



Concluding Remarks

- “In a world where dementia is on the rise and caregivers are unavailable or unable to meet the needs of individuals with dementia, **technology can and should** play an important role”
- “Carefully designed technologies... can deliver person-centered, non-drug interventions to mitigate and manage disease symptoms, especially neuropsychological symptoms, thereby supporting and improving wellness and independence of individuals with dementia and their caregivers.”

Kerssens, C., Slatter, M. & Monterio, A. (2014). Managing Dementia Symptoms and Needs Using Technology. *J Gerontological Nrsng*, 40(7), p.20

Discussion/Questions?

- Powerful paradigm for translating continuous data into predictive tools.
- Use “big data” to inform models that can predict pre-clinical changes that may allow early intervention to prevent, delay or mitigate declines in health and function.
- Design technology systems to support caregivers by addressing practical issues (i.e. wandering, falls, cognitive declines)
- Access to a large number of older home-dwelling adults and their health care records.

Thank you!

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