

A photograph of a young man with brown hair, wearing a blue and white plaid shirt, hugging an elderly woman with short, wavy white hair. The woman is wearing a blue jacket. They are both smiling warmly at the camera. The background is a soft-focus outdoor scene with green and yellow foliage.

# Disrupting the AT and Aging Landscape

**Alex Mihailidis, PhD PEng  
RESNA Annual Conference  
June 28, 2017**

There is

**STRONG  
POTENTIAL**

for AT to support

**HEALTHY &  
ACTIVE  
AGING**

# The Rising Tide

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Globally, healthcare systems are currently faced with the challenge of caring for an increasing number of older adults

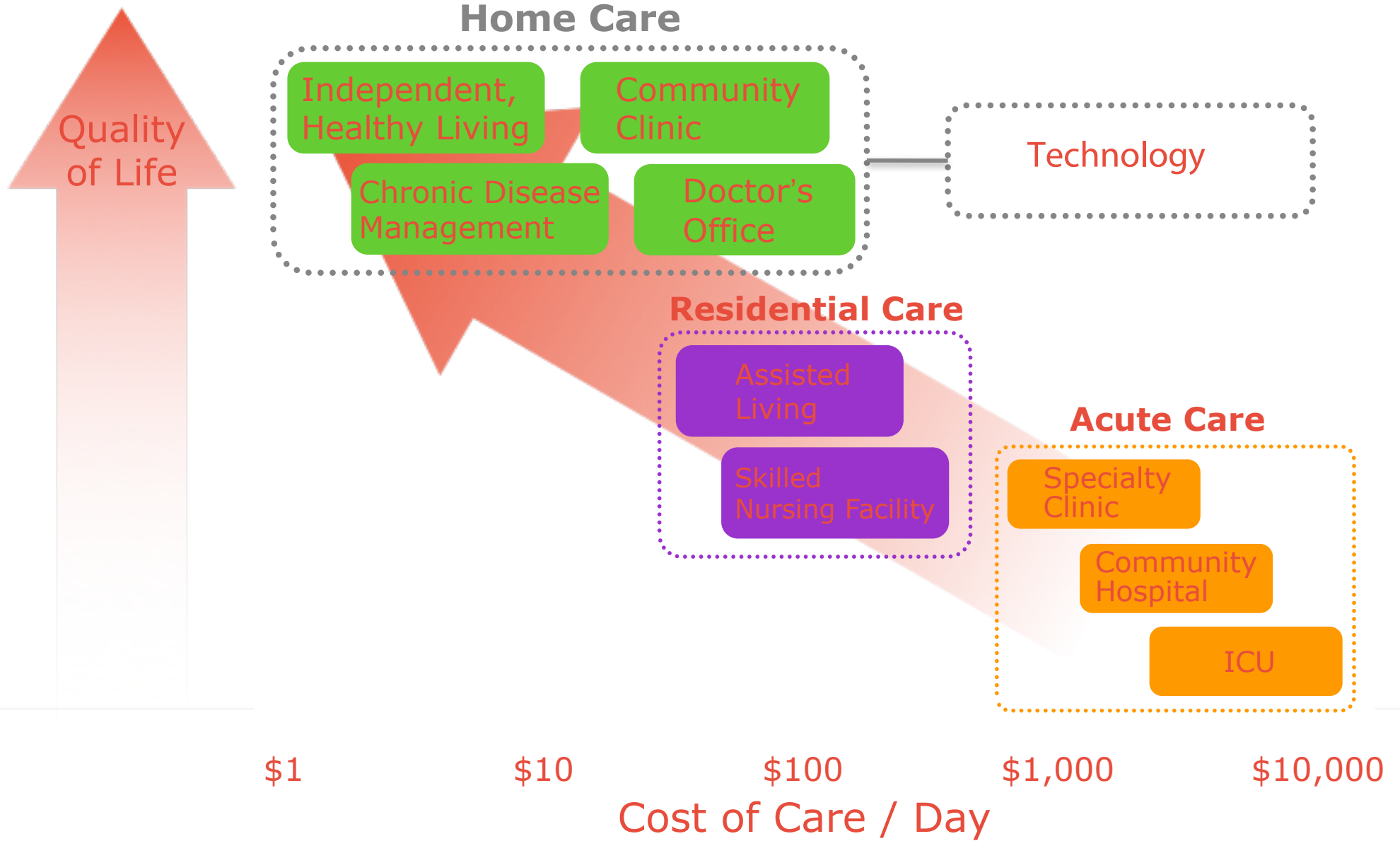
A large proportion of these individuals are living with diseases and impairments that are beyond those related to the normal aging process

## Further Complications....

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There is also a significant decrease in the number of caregivers, many of whom are experiencing their own physical and mental health challenges (70-80%)

# Technology as a Solution



# Failure to Launch

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There are very few devices available,  
with many of them being too expensive  
and difficult to use

## Why is it like this?

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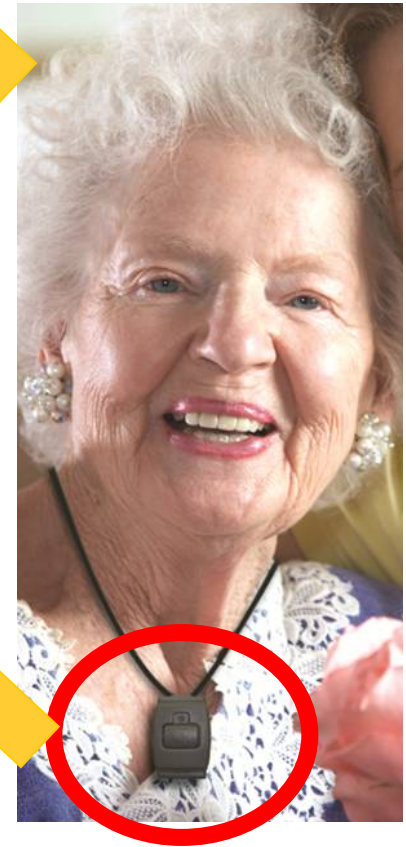
The needs of older adults are complex, and are even more so in the face of specific impairments and diseases.

More often than not, an understanding of these users' needs is not part of a project.

There has been a “silo” mentality in this field that has resulted in poor outcomes.

# Current technologies are stigmatizing

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# Changing Demographics, Changing Expectations



**Older adults (and their caregivers) are becoming more tech savvy**



**There are growing expectations on the integration of technologies into their daily lives**

# Disruption

NEXT EXIT



# Disruptive Technologies

....when introduced, either radically transforms markets, creates wholly new markets or destroys existing markets for other technologies.



## Our Goal

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Our goal **MUST BE** to develop disruptive technologies that can enable aging-in-place, and to support caregivers and families.

# Disruption requires INSPIRATION



Aging Gracefully across Generations using Technology  
to Support Wellness, Engagement, and Long Life



# Disruption requires NEW WAYS OF THINKING

# Looking at other Disciplines

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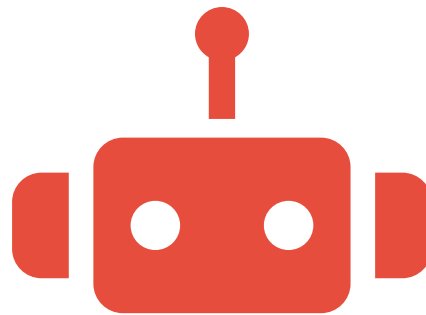
# Emerging Areas

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New approaches are leading to new promising areas of research and leading edge technologies



**Smart Homes**

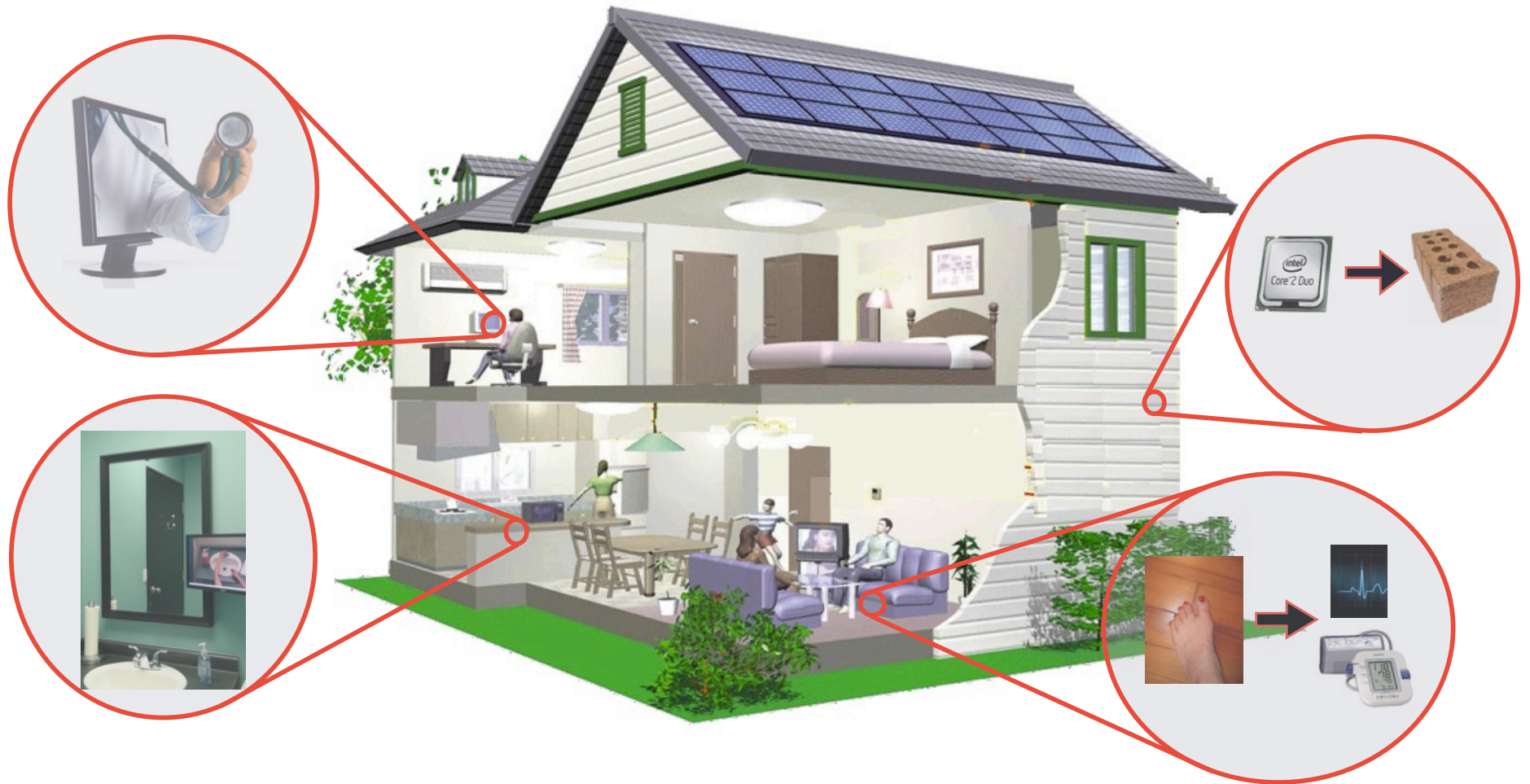


**Robotics**



**Big Data**

# Smart Homes



# Ambient-Based Physiological Monitoring

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Many seniors are required to monitor and report on various chronic conditions (e.g. diabetes, CHF)

They are required to use technologies to collect data

Often these technologies have poor usability leading to poor adherence

WS: June 29 @ 11 am

# Ambient-Based Physiological Monitoring

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# Robotics



Social Robots



Assistive Robots

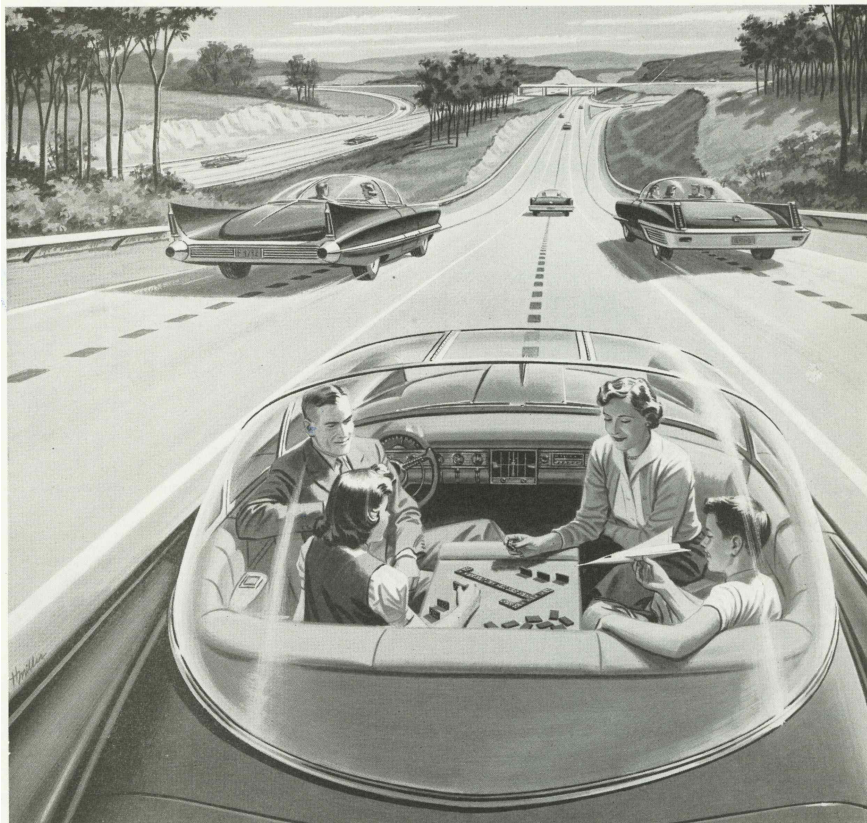
WS: June 29 @ 2:45 pm

# Introducing, Ed

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# Robotics – Driverless Cars



**ELECTRICITY MAY BE THE DRIVER.** One day your car may speed along an electric super-highway, its speed and steering automatically controlled by electronic devices embedded in the road. Travel will be more enjoyable. Highways will be made safe—by electricity! No traffic jams . . . no collisions . . . no driver fatigue.



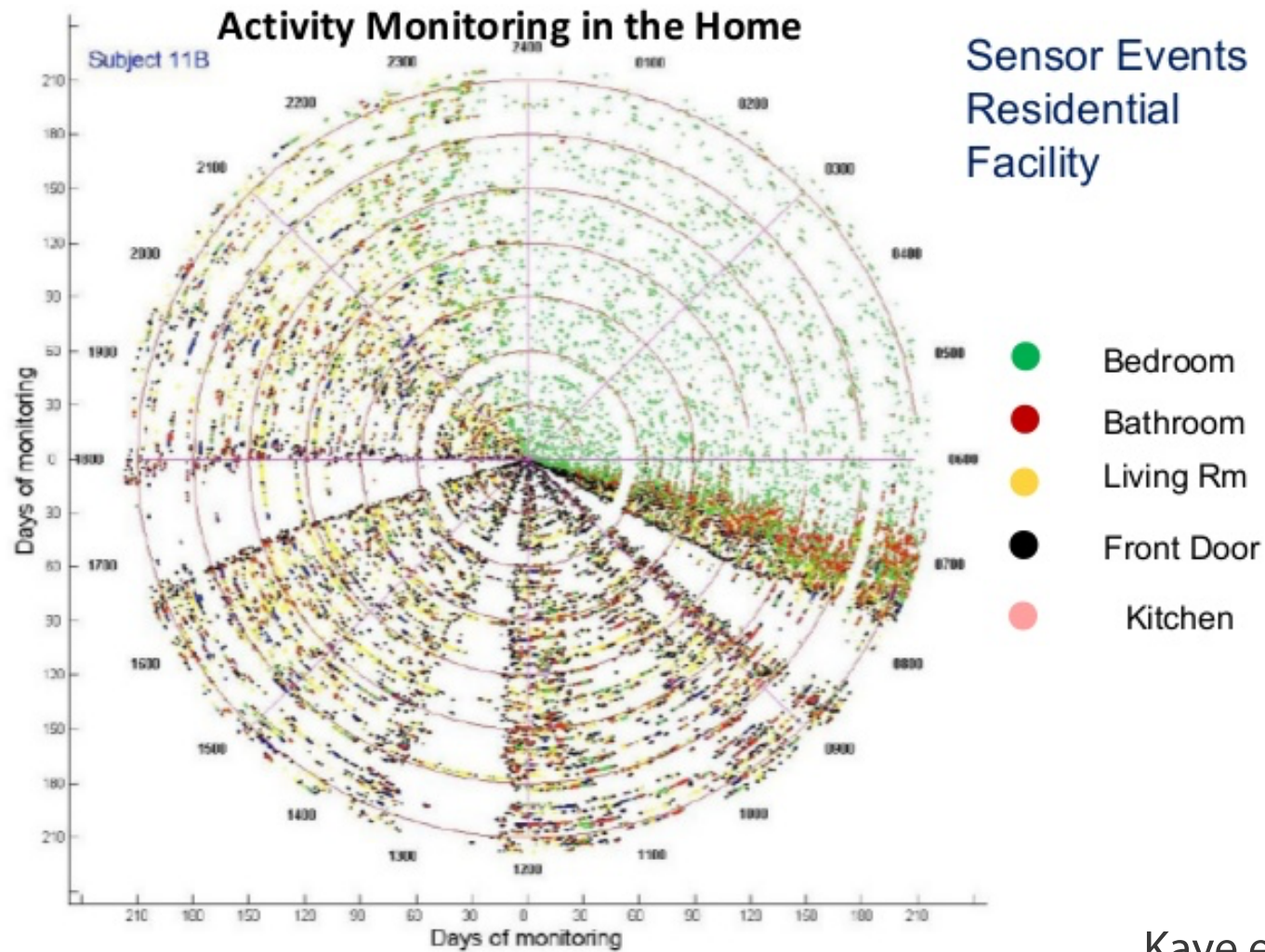
*“The self-driving car — a godsend for older Americans — is now on the horizon” – AARP (2015)*

# Big Data in the Home





# Big Data – Patterns of Living



Kaye et al. (OHSU)

Big data allows us to look forward and predict changes in health before they even occur

# Predicting Cognitive Impairment

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**3 months**

**85%**  
**ACCURATE**

The current landscape  
needs to change in  
order for these new  
innovations to make it  
to the marketplace

Accept  
risk

Change  
delivery  
models

The current landscape  
needs to change in  
order for these new  
innovations to make it  
to the marketplace

Don't fear  
competition

Rethink  
the way we  
design



Ageing Gracefully across Lifetimes using Technology  
to Support Wellness, Engagement, and Long Life

## New Delivery Models in AT

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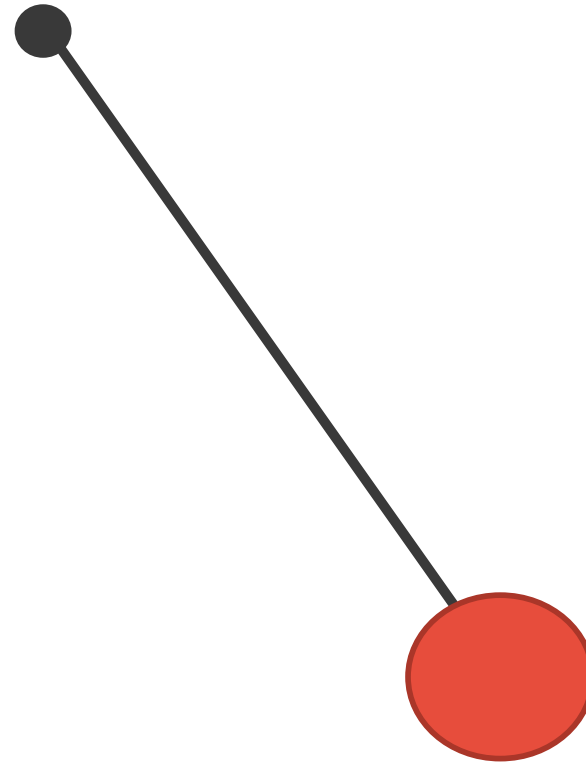
The majority of new technologies to support older adults are NOT medical devices

They are being developed as consumer products that could be purchased directly by the consumer

More importantly, there is a grassroots movement in the AT field where consumers (e.g. caregivers) are building their own solutions

# Has the pendulum swung too far?

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Market  
Pull

Market  
Push

# THE INNOVATORS' DILEMMA

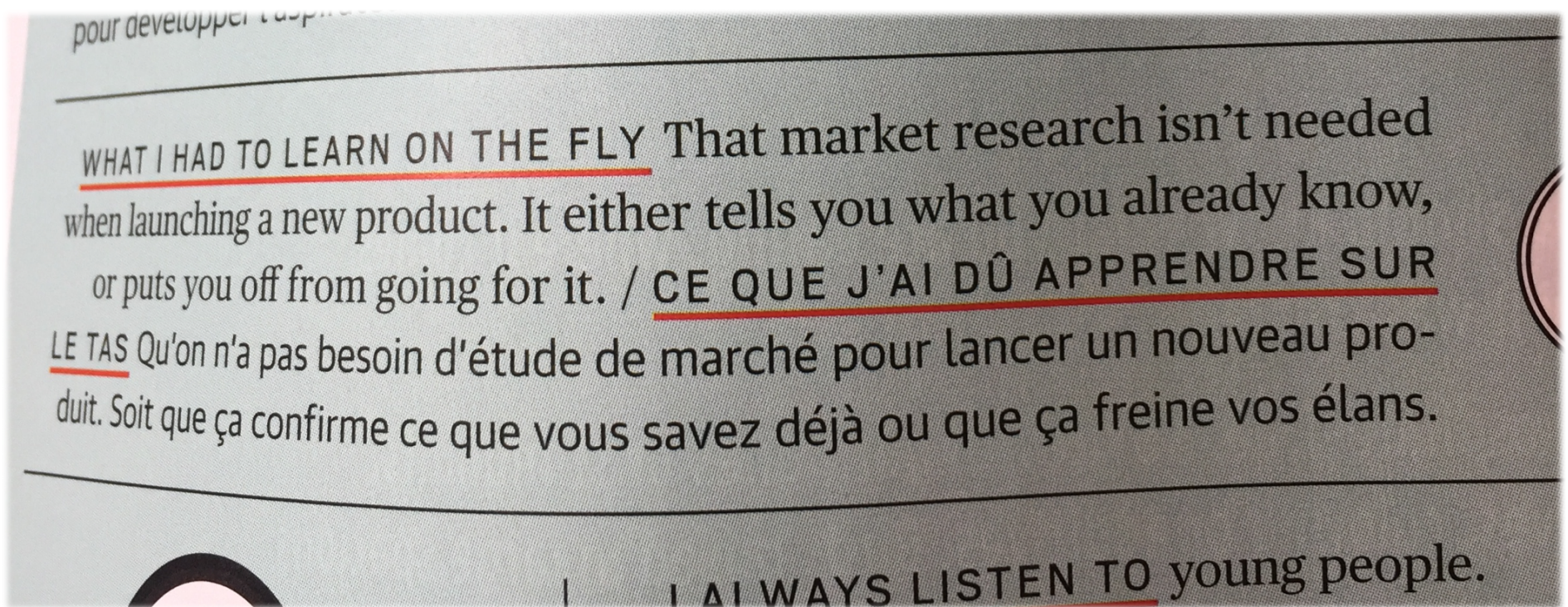
We put too much emphasis on customers' current needs, and fail to adopt new technology that will meet their unstated (or unknown) future needs.

Christensen, 1997





# Is Innovation Being Stifled?



- James Dyson

Disruption needs to be  
**COLLABORATIVE** and  
**TRANSDISCIPLINARY**

# Collaborative Efforts

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It has been demonstrated that by bringing the “best and brightest” together we can solve really tough and challenging problems.

- RERC TechSAge (**WS: June 28 @ 11 am**)
- AGE-WELL NCE (**Exhibit Hall**)
- AAL-JP



# AGE-WELL - VISION

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To harness the potential of technology to provide high-quality and sustainable services and solutions to meet the needs of the current and future generations of older adults in Canada.

# AGE-WELL by the Numbers



**100+**  
RESEARCHERS



**150+**  
HIGHLY QUALIFIED  
PERSONNEL (HQP)

**26** Canadian Universities  
& Research Centres

**57** Industry &  
Community Partners

**24** Federal & Provincial  
Departments & Agencies



**36.6M**

**FUNDING (2015-2020)**  
from the Networks of  
Centres of Excellence (NCE)

**22M+**

**CASH AND IN-KIND**  
Contributions from  
Partners

# Example Innovations Being Developed

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- New tools for the inclusion of end-users
- Smart home systems to support seniors
- New novel sensors to measure activity levels
- Non-contact physiological monitoring systems
- Social and personal robotics
- Technology to monitor and assess mental health
- Technologies for socialization and connectedness
- Understanding policies and regulatory issues

# Need for a Change

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As demographics change, the end users of AT are changing as well (and those who are purchasing).

In addition, AT are starting to be used in new applications and contexts.

As such, new approaches are needed to ensure that AT remain as usable as possible

Is Innovation in AT falling behind innovation in tech and aging?

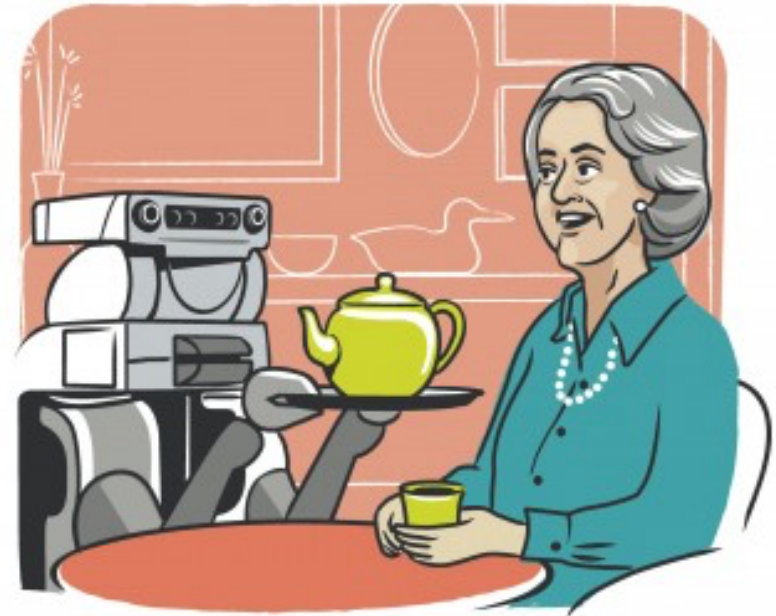
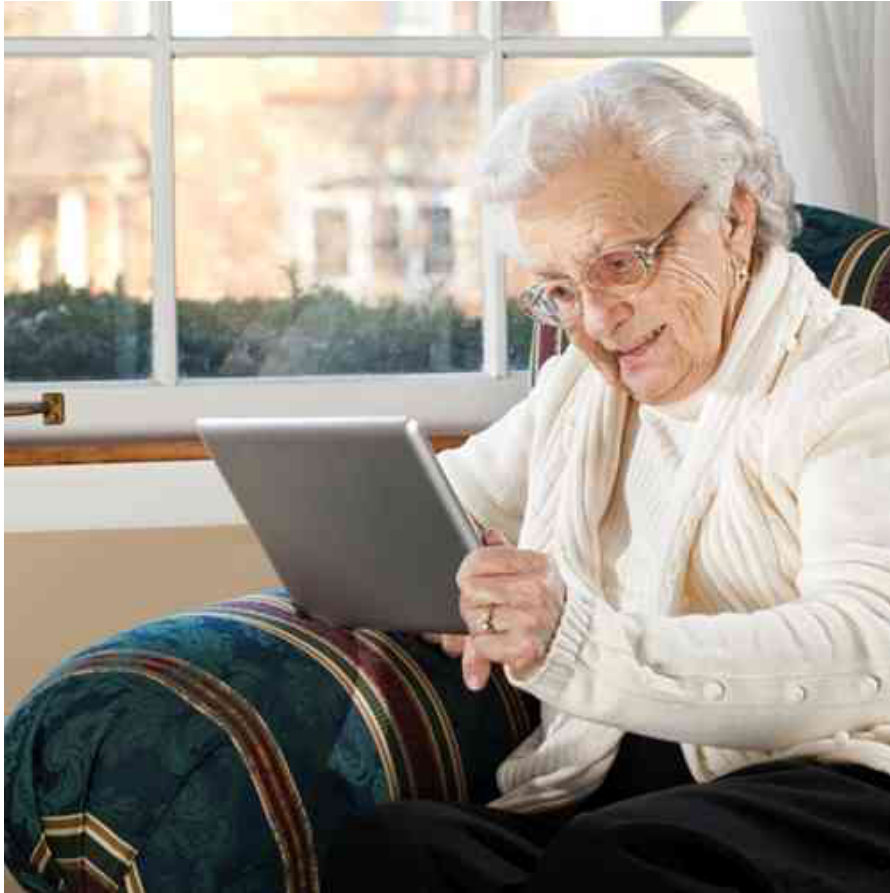
# Aging $\neq$ Disability



# Rethinking What is AT



# Rethinking What is AT



# RESNA's Role?

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Provide the venue and forum for change to occur in the AT field

Create a transdisciplinary environment for the sharing of ideas and novel approaches

Ensure that R&D in AT remains as an important aspect of the field (that is promoted and celebrated)

**Do not become a victim of the  
Innovators' Dilemma**

# Going Forward

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The time is now!

Being incremental in this field is no longer acceptable

The technology may be the easy part

Ethical, social, and cultural aspects need to be considered and incorporated throughout the process

# For More Information

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Aging Gracefully across Environments using Technology  
to Support Wellness, Engagement, and Long Life