TRENDS IN HOME CARE AND WORKFORCE NEEDS

Robyn I. Stone, DrPH
LeadingAge LTSS Center @ UMass Boston

Grantmakers in Aging 2017 Conference
October 18, 2017
DRIVERS OF THE HOME CARE WORKFORCE TRANSFORMATION

- Demands of an aging population
  - By 2030, 1 in 5 people in U.S. will be 65+
  - 85+ population grows five fold
  - By 2035, number of households with older adults with disability will increase to 31.2M
  - Prevalence of dementia and Alzheimer’s disease

- More ethnically/racially diverse older adults and staff and implications for cultural competence

- Emerging care gap
  - 5 million direct care workers needed by 2024
  - More home care aides leaving than entering long-term care workforce
POLICY: EXPANSION OF HCBS

- Consumer preference to age in place
- Re-balancing the LTSS system
  - Money Follows the Person
  - Balancing Incentive Payment Program
- Nurse Delegation
  - State variation in how regulate and implement nurse delegation acts
  - 2016: 16 states allow RNs to delegate 16 tasks to aides
  - 19 states increased number of tasks to be delegated from 2013 to 2016
- Medicaid Managed LTSS
- Integration of Medicare and Medicaid Services
  - PACE
  - Financial Alignment Initiative
MARKET FORCES

- **Proliferation of private-pay home care models**
  - Private duty home care industry has grown by more than half from 2011 to 2015
  - Home care providers establishing Preferred Provider Agreements with certified home health agencies

- **Consumer-direction in LTSS**
  - Greater choice and autonomy in how use resources
  - Paying family caregivers

- **Technology-based platforms**
  - Leveraging technology to connect clients and caregivers in an on-demand system
  - Variation in use of employer models
MARKET FORCES CONT.

- Managed care-based models expanding into MLTSS programs
- Growth of for-profit home care agencies
  - Notable trend health systems buying into private duty franchises
- Worker-owned home care cooperatives
  - Aides owners and operators of their own business; empower workers
  - Slow growth
- Home care registries
  - 30 nonprofit registries in 23 states
TRAINING AND COMPETENCIES

**Worker Competencies**
- No federal home care aide competencies and lack of competency-based training programs
- Personal Home Care Aide State Training Demonstration Program (PHCAST)

**Training and Education**
- Initial and ongoing training inconsistent state-to-state
- Little progress since IOM recommended more geriatric, cultural competence, soft skills, palliative care training
- How to pay for training? Who is responsible for training? What types of supports needed for workers? Most beneficial in-service training?
PROFESSIONAL DEVELOPMENT AND ADVANCEMENT

- Career pathways can identify core competencies necessary for home care aides and advanced competencies to serve in enhanced roles
- Key members of care teams in integrated and coordinated care models
- Possible enhanced responsibilities
  - Clinical observations and report changes
  - Advanced tasks
  - Medication adherence
  - Specialize in condition-specific roles
- Expanded roles through nurse delegation and increasing scope of practice
TECHNOLOGY

- Not competitive technologically
- Technology platforms most often reported: Documentation and accountability support (automation of daily operations)
- Data tools for documenting client information and alerting team members when change occurs. How is data integrated within healthcare system?
THANK YOU!

WASHINGTON, DC OFFICE
ltsscenter@leadingage.org
202.508.1208

BOSTON OFFICE
ltsscenter@umb.edu
617.287.7324

www.ltsscenter.org
Agenda

- Connected Aging Landscape
- Innovation Ecosystem & Learning Laboratory
- LTC Workforce: Technology Use and Training
- Emerging Technology Innovations
New Era of Connected Aging
Connected Aging Landscape

- **Body**
- **Home Environment**
- **Community**
- **Caregiving**
Connectivity and Data are Exploding

THE INTERNET OF THINGS
AN EXPLOSION OF CONNECTED POSSIBILITY

- 1992: 1,000,000
  - Connection of the population of Japan

- 2002: 0.5 BILLION
  - Asynchronous internet connected devices in use

- 2003: 0.5 BILLION
  - Connections increase connected devices per capita

- 2005: 1.2 BILLION
  - Increase in products with internet connection

- 2010: 22.9 BILLION
  - Quarterly growth of homes with internet access

- 2015: 14.4 BILLION
  - IoT Inception

- 2016: 34.6 BILLION
  - Smart Devices

- 2017: 26.4 BILLION
  - Internet of Things

- 2018: 18.2 BILLION
  - Smart Devices

- 2020: 50.1 BILLION
  - Internet of Things

- 2020: 100 BILLION
  - Projected

- 2025: 500 BILLION
  - Projected

- 2050: 1 TRILLION
  - Projected

CITRIS BANATAO INSTITUTE
UNIVERSITY OF CALIFORNIA
BERKELEY DAVIS MERCED SANTA CRUZ
What Are The “Things”? 

The 10 most popular Internet of Things applications
A ranking based on web analytics

1. Smart Home 100%
2. Wearables 63%
3. Smart City 34%
4. Smart Grid 28%
5. Industrial Internet 25%
6. Connected Car 19%
7. Connected Health 6%
8. Smart Retail 2%
9. Smart Supply Chain 2%
Rapid Evolution of Technology

- Existing technologies becoming off-the-shelf
- A wide range of new consumer-oriented technologies
- Comfort level of older adults with tech
- Emergence of platforms & data
- Smaller, faster, cheaper
- Connected Health Technology Market to reach $117B by 2020
Watch technology is where phone technology was in 2000
Emerging Landscape of Connected Aging

Older Adults Use of Technology Changing

Technology use by older adults increasing

Text/internet use increasing

[Graphs showing the increase in technology use from 2009 to 2012 for different generations, with a significant upward trend.]
Emerging Landscape of Connected Aging

Increasing Use of Technology by Family Caregivers

Percentage of Caregivers Conducting Online Health-Related Activities

- Consult Online Reviews of Drugs: 24%
- Go Online for a Diagnosis: 46%
- Participate in any Online Social Activities Related to Health: 52%
- Gather Health Information Online: 72%

Source: Pew Research Center/California HealthCare Foundation
Prevailing Trends: 5-Year Forecast

Challenges
- Aging Population
- Chronic Disease
- Caregiving
- Urban/Rural
- Workforce Shortage

Technologies
- Cloud & Mobility
- Quantified Self
- Internet of Things
- Nanoscale
- Exponential Data

Solutions
- Personalized Care
- Behavioral Change
- Client Engagement
- Remote Care
- Customization
- Actionable Data

A new generation of information technology solutions for work force
CITRIS and the Banatao Institute:  
AN INTERDISCIPLINARY RESEARCH ORGANIZATION FOR SCIENCE AND INNOVATION

<table>
<thead>
<tr>
<th>UC CAMPUSES</th>
<th>ANNUAL RESEARCH INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkeley</td>
<td>$90 million</td>
</tr>
<tr>
<td>Davis</td>
<td>leveraged from ~$4M in university funds</td>
</tr>
<tr>
<td>Merced</td>
<td></td>
</tr>
<tr>
<td>Santa Cruz</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>START-UP companies</th>
<th>CORE FACULTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>60+</td>
<td>80+ members (300+ affiliates)</td>
</tr>
</tbody>
</table>
INITIATIVES

Sustainable Infrastructures
- Energy efficiency
- Smart grid
- Water conservation
- Transportation
- Internet of things
- Wireless Sensor Networks
- Software Defined Buildings

Connected Communities
- Participatory platforms
- Connected devices
- Mobile Apps
- Interactive Media
- Crowdsourcing
- Open data
- Privacy and Security
- Digital Governance

People and Robots
- Cloud robotics
- Deep learning
- Human-centric automation
- Bio-inspired robotics
- Statistical sampling
- Robustness
- Privacy
- Inclusion

Health
- Data Analytics
- Telehealth
- Precision medicine
- Chronic disease
- Sensors and Services
- Wearables
- Quantified self
- Patient engagement
- Connected health
AN EXPANDING INVENTION ECOSYSTEM

Specialized Testbeds & Labs
- Marvell NanoLab
- Invention Lab
- The Foundry

Across 4 Campuses

+ Seed Funding & Membership Programs
The CITRIS Foundry

>$35M Raised by Our Companies
>$50M Added to California’s Economy
>125x Multiplier On Seed Funds

37 Companies Accelerated

GlamorSky
mentl.io
WattTime
bioinspira
Cal Wave
bash
smartbed
TEAMAN & COMPANY
dropsense
Clarity
simplewater
KNOX MEDICAL DIAGNOSTICS
DASH ROBOTICS
INNOVATIVE ORIGAMI ROBOTS
Lion Semiconductor
CORRELLIA BIOSYSTEMS
CORTERA neurotechnologies
CITRIS AND THE BANATAO INSTITUTE
UNIVERSITY OF CALIFORNIA
BERKELEY DAVIS MERced SANTA CRUZ
CITRIS Innovation Ecosystem

- Jacob Design Institute
- CITRIS Invention Lab (Maker Space)
- CITRIS Social Apps Lab
- Foundry (Incubator)
- Multi-campus Testbeds & Facilities
- Seed Grants
- Corporate/University & Partnerships
- Blue Bear Ventures
Technology Learning Testbeds

Senior Residential
Assisted Living
Dementia Programs
Home Health Agencies
Geriatric Care Managers
Home & Community
Senior Transportation
Caregiving Providers
Government & Associations
Hospital & Health Systems
Age Friendly Cities
Lifelong Learning
Age Friendly Cities
Geriatric Care Managers
Caregiving Providers
Government & Associations
Home Health Agencies
Senior Residential
Dementia Programs
Senior Transportation
Caregiving Providers
Hospital & Health Systems
Age Friendly Cities
Lifelong Learning

Technology Learning Testbeds

Senior Residential
Assisted Living
Dementia Programs
Home Health Agencies
Geriatric Care Managers
Home & Community
Senior Transportation
Caregiving Providers
Government & Associations
Hospital & Health Systems
Age Friendly Cities
Lifelong Learning
**CITRIS Health**

**Mission:** Improving health outcomes and access to cost-effective care through the development and integration of innovative technology in telehealth, sensors, analytics and mobile devices.

**Strengths:** Data Analytics for Health, Telehealth, Sensors and Services, Mobile Health Apps, Quantified Self and Wearables, Gamification and Behavioral Change, Precision Health, Patient Engagement, Chronic Disease Management, Workforce Solutions, Population Health, Global Health
Center for Technology and Aging

- Wellness and Social Engagement
- Independent Living
- Assisted Living and Long-term Care
- Chronic Disease Management
- Long-term Care Workforce
Technology Demonstration Projects

• Chronic Disease Management:
  – Medication Monitoring & Adherence
  – Remote Patient Monitoring
  – Technologies for Improving Post Acute Care Transitions

• Mobile Health Solutions

• Social Connectedness & Engagement

• Data & Data Analytics
Hospital to Home
Precision Medicine & Population Health

Data

Analytic Engine

Chronic Disease

Patient Engagement
Connected Aging Workforce Tech

- Withings
- Fitbit
- AliveCor ECG
- Basis
- Mood Scanner App
- ZIO
- MedMinder
Connected Aging: Wearables

Jawbone UP and Platform

FITBIT

CITRIS AND THE BANATAO INSTITUTE
UNIVERSITY OF CALIFORNIA
BERKELEY
DAVIS
MERCED
SANTA CRUZ
Remote Patient Monitoring
Sharp HealthCare

**Goal:** Reduce 30-day readmissions by 30% from 22% to 15%

**Patient Population:** Underserved (Medi-Cal, Unfunded, County Medical Services) with primary or secondary diagnosis of CHF or COPD

**Intervention:** Mobile health device used daily to measure pulse oximetry and functional status via yes/no questions coupled with nurse education and health coaching which included at least two home visits
Connected Aging: Environment

Environment

VueZone™

Quietcare®

Iris

EMTWatch™

Lively

Lifeline®
Connected Environment

HealthSense

How the Wellaware™ System Works

Key Components

1. Data Manager
   The Data Manager receives wireless signals from an array of sensors. The data can be transmitted via a phone line or wired/wireless broadband.

2. Authorized Caregivers
   Data is analyzed 24/7 on a private, secure server. Caregivers can easily access the password-protected wellness and trend reports from any computer with Internet access. Alerts can be received via email, text message, pager and PERS system.

3. User-Friendly Reports
   User-friendly reports are designed to proactively identify emergent wellness conditions and improve care delivery efficiency.

How the Wellaware™ System Works

1. Data Manager
   The Data Manager receives wireless signals from an array of sensors. The data can be transmitted via a phone line or wired/wireless broadband.

2. Authorized Caregivers
   Data is analyzed 24/7 on a private, secure server. Caregivers can easily access the password-protected wellness and trend reports from any computer with Internet access. Alerts can be received via email, text message, pager and PERS system.

3. User-Friendly Reports
   User-friendly reports are designed to proactively identify emergent wellness conditions and improve care delivery efficiency.
Connected Aging: Community & Engagement

- Skype
- Wii Fit Games
- Tapestry
- Volunteering
- Support site
Community Engagement Platforms

Connect

Micro-Communities

Personal Profile

Resource Matching

LinkAges

Connect

using devices and people sensing to monitor health and wellbeing.

Micro-communities building community and social engagement through neighborly service exchange.

Personal Profile capturing personal and social context to personalize system behavior.

Resource Matching senior-relevant resource reviews.
Connected Aging: Community

Independa

PatientsLikeMe
Connected Aging: Family Caregiving

PatientPoint

Procura

ElderCare Link

HealthyCircles™

Family Caregiving
Family Caregiver Alliance

Alzheimer’s Association

Education and Information for Workforce and Caregivers

MedHelp
Changing Use of Technology by Work Force

- 55% hospitals and health systems using RPM
- 80% of physicians using smartphones
- 74% of health providers using tablets
- 90+% of providers using EMRs
TECHNOLOGY SELECTION: Lessons Learned

• Appropriate for client and provider
• Saving time & energy vs losing time
• Comfortable Design: Universal/simple
• Interoperability: Connecting tech
• Innovative vs tried and true
• Affordability, maintenance, durability
WORKFORCE TECHNOLOGY DEPLOYMENT: Lessons Learned

90% of technology deployment/ adoption:
- Organizational leadership – Champion
- Change management
- Staff engagement and buy-in
- Client/Provider selection & engagement
- Work flow processes
- Technology deployment strategy
- Communication and staff/patient training
- Plan for Scaling and Sustainability

Technology is 10% of the Issue

ADOPT toolkit
Accelerating Diffusion of Proven Technologies
WORK FORCE TECHNOLOGY EDUCATION: Change What We Teach

- New Technologies / Use of Technology
- What Clients/Providers are using
- Learn from students & end users
- Teach processes rather than tech
- Teach where to find tech solutions
WORK FORCE TECHNOLOGY
EDUCATION: Change Where We Teach

- No longer classroom
- Any where, any time
- New platforms: mobile to MOOCs
- Ad hoc peer learning groups
- Automatic generation of feedback
- Crowd sourced design critique
WORK FORCE TECHNOLOGY EDUCATION: Change How We Teach

• Hands on solutions
• Test-beds & embedded programs
• Virtual / Simulation / Immersive
• Remote training
• Integrated in innovative, evolving care systems
EMERGING TECHNOLOGY INNOVATIONS
Impacting Long Term Care Workforce

EMR
Connected Medical Devices

Telehealth/Remote Monitoring

Falls Prevention

Communication Platforms/Care Management

Financial/Cognitive Technology

Smart Environment & IoT

Assistive Technologies

Virtual Reality/Augmented Reality

Smart Medication Management

Robotics/Autonomous Vehicles

Smart Body Sensors

Big Data/Al & ML
Patient Generated Data
Integration to EHR

PERCEPT - UCSF/UCB/UCD

UCDHS Patient
- UCDHS Portal
- Visualization - Dashboard
- MyChart

UDCHS Provider
- Epic Hyperspace
- Visualization - Dashboard
- PCP/Nurse Coach/Care Team

Data flows from Patient Generated Health Data to UCDHS Portal and UCDHS Provider. The data is then managed and authenticated through MyChart. Raw responses are stored for analysis, enabling research and other analytical capabilities. "Actionable" summary information is within Epic Clarity.
Falls Prevention & Mobility
Financial / Cognitive Technology

Financial Security

True Link

Eversafe

Citris and the Banatao Institute

University of California

Berkeley

Davis

Merced

Santa Cruz
Connected Home Environment & IoT

HealthSense

Emerald
Medication Adherence
Front Porch mHealth Program

• **Goal:** Improve medication adherence among active, independent older adults through mHealth solution

• **Outcomes:**
  - Mobile alerts and monitoring led to improved medication adherence
  - Consumer champions are key; personalized engagement
  - Replicable model that combines education, training, and other resources
Smart Medication Management: Medication Adherence

Ingestibles (Proteus)

Apps
Transportation / Robotics

Driverless Cars (Google)

Shared Economy (Lyft)
Virtual Reality & Augmented Reality
Voice Recognition & NLP

Source: Aging 2.0
Data & Data Analytics
Artificial Intelligence/Machine Learning

Electronic Health Records....

Genomic Data...

Diagnostic test results....

Wearable health monitoring...

Social media...
WORK FORCE TECHNOLOGY: SOLUTIONS FOR THE FUTURE

• Aging and persons with disabilities – usability and accessibility
• Global/universal solutions
• Inclusion of the consumer
• Public/Private sector collaboration
• Transformative technology solutions – scalable and sustainable

Work force and technology – tools to advance the well being of older adults...
RESOURCES

• PCAST Independence and Technology Report

• Emerging Technology and Aging White Paper – CTA & CITRIS

• Blogs and Web sites
  ➢ Aging in Place Technology Watch, AARP, Associations

• Conferences
  ➢ Leading Age, Aging 2.0, Connected Aging, Argentum, Aging in America, Gerontological Society of America
Thank you
http://citris-uc.org

Creating information technology solutions for society’s most pressing challenges
No Care Without Caregivers
Reinventing care work as a good job & preventing the coming care crisis
Charissa Raynor, Executive Director
SEIU 775 Benefits Group
What We All Need
Income
Stress
Health
Injury

Home Care Aide
Tong
Joy
Calling
Love
Purpos
Learning to Care
Not tea and bridge with grandma!

High chronic disease

Significant / persistent mental illness

Substance abuse

Polypharmacy
Data Results: Behavior and Psychosocial Needs

Clients with Behavior Issues*  
<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>72.0%</td>
<td>72.7%</td>
<td>72.6%</td>
</tr>
</tbody>
</table>

*Source: CARE LTC Assessor’s Manual, Section 46.2 Behavior Coding

Alterability of Behavior for Clients with Behavior Issues

Clients with:

<table>
<thead>
<tr>
<th>Year</th>
<th>Nighttime Behavior Issues</th>
<th>Sleep Issues</th>
<th>Suicidal Ideations (in Last 30 Days)</th>
<th>Decision Making Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>8%</td>
<td>43.2%</td>
<td>2.6%</td>
<td>59.6%</td>
</tr>
<tr>
<td>2012</td>
<td>8%</td>
<td>44.7%</td>
<td>2.5%</td>
<td>57.1%</td>
</tr>
<tr>
<td>2013</td>
<td>8%</td>
<td>45.4%</td>
<td>2.4%</td>
<td>56.9%</td>
</tr>
</tbody>
</table>
Nation’s largest educational institute for care workers

50,000+ trained annually

13 languages

Responsive web app for mobile

In-person learning labs
Nation’s highest training standards

Basic

Advanced

Continuing Education

Peer Mentorship
Flipped classroom

High-fidelity assessment

Competencies via service design research
Staying Healthy: Mentally

Home Care Aide
Fatima
28% high ACEs score
50% anxiety
33% depression
Mindfulness RCT with UCLA

Online self-check

Trauma informed service design

Help hotline
Staying Healthy: Physically

Home Care Aide
Cerise
46% Obesity

26% Morbid obesity

High chronic disease
Virtual diabetes prevention program

Plant-based diet exchange experiment

Power of You campaign

Home Care Aides Kalkidan, Van & Flo
Danger
On the Job
Home Care Aide
Penny
4x more likely to be injured

90% worried about risk

Underreporting

Not just garden variety physical injury

Abuse
Data Results: Behavior and Psychosocial Needs

Prevalence of Aggressive Behavior*

<table>
<thead>
<tr>
<th>Year</th>
<th>2008</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Clients</td>
<td>26.8%</td>
<td>16.9%</td>
<td>17.4%</td>
<td>17.4%</td>
</tr>
</tbody>
</table>

Clients with Aggressive Behavior – Type of Behavior*

- Assaulitive
- Breaks, throws items
- Combative during personal care
- Intimidating/threatening
- Seeks vulnerable sexual partner

Legend:
- 2008
- 2011
- 2012
- 2013
Equipment timeliness study

Safety shoes pilot

Low tech tools for lifting

Home Care Aide
Leahanna with safety backpack
R&D Approach
Not enough focused investment
Research
Design
Rigorous evaluation
Fit, scalability, sustainability
Love the problem, test the solution

Goal-driven design

Value prop canvasing

Lived experience
Solution Space

USA BORN
ENGLISH
HISPANIC
DIVORCED

DEPENDENT(S)
URBAN, TACOMA
ATTENDED COLLEGE/UNIV.
$100K+

PAST JOBS
Nurse
Phlebotomist
Caregiver
Financial Serv.

CURRENT JOBS
HCA
Financial Pro.

HC TRAINING
Orientation & Train
BT Registration
Completed BT
Attened Class
HCA Certified
CE/Adv. HC Training

MEDICAL LITERACY
Thinking about own health (unless self), but...

Self Efficacy on Technical Aptitude

CONNECT WITH LOVED ONES

PRIORITY
TIME ON INTERNET
1-5 HOUR(S)
ONLINE ACTIVITIES
SURF INTERNET
LOOK UP INFO
WATCH VIDEOS
CONNECT W/ FAMILY
ACCESS EMAILS
PLAY GAMES

OTHERS
Social Media

HABITS/BEHAVIORS WITH CLIENTS: FAMILY / NON-FAMILY
CONTROL
EMOTIONAL
COLLABORATIVE
RESPONSIBILITY
PERSONAL

ATTRIBUTES OF HOME CARE AIDS, LEVEL OF IMPORTANCE
RELIABILITY
PATIENCE
COMPATIBILITY
PROFESSIONALISM
KNOWLEDGEABLE
COMFORTABLE
ADAPTABLE

TOP 5 CHALLENGES AS HCA
Communication and really listening.
1. His behavior
2. His transportation
3. His work and issues there
4. Coping his Medicare

OVERCOME CHALLENGES
1. Time
2. Resource
3. What makes me feel successful
Take care
Thank You!
Charissa Raynor, Executive Director
SEIU 775 Benefits Group
charissa.raynor@myseiubenefits.org
Home Care Aide
Gracia