Existing and Emerging Technologies
within the
Long-Term Care Spectrum

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HealthTech

PPt from NEST event
June 11, 2009
10 to 11 AM PDT
Introduction and Objectives

In this session we will:

1. Discuss barriers to implementing technologies residential long term care settings and a web-based resource for care providers

2. Highlight the most promising technologies for maintaining the independence of older adults in community-based settings

3. Identify synergies between technology and the long-term care workforce

4. Forecast challenges to and opportunities for the use of technology in aging
Barriers to Technology Implementation in Long-Term Care Facilities

- **Supported by Funding from:** DHHS Office of the Assistant Secretary for Planning and Evaluation, Contract #HHS-100-02-0017


Development & evaluation of [www.techforltc.org](http://www.techforltc.org)
Barriers to Technology Implementation in LTC

Goal of study: To identify social, economic, and regulatory barriers to technology implementation in residential LTC in the U.S.

Method: Semi-structured interviews to elicit themes from 16 LTC technology experts
  * Technology manufacturers (4)
  * LTC Providers (6)
  * Regulators (3)
  * Researchers (3)

Tape recorded interviews, 30-45 minutes in duration

Transcripts coded independently by two raters.
Summary of Themes

Financial Concerns

Regulation

Challenges of managing change

Lack of information about

- cost-effectiveness of technologies
- the range of technologies available
- residential long-term care market
Addressing the barriers: www.techforltc.org

Helping professionals make informed decisions about care technologies...

Funded by: NIA SBIR Phase 1 & 2 grants, #R43 & R44 AG026170-01A1
Technology for Long Term Care is a free government funded resource containing information on hundreds of technology products to improve quality of life and care for people in long-term care settings such as nursing homes, assisted living, boarding care, and adult day care programs.

Technology for Long-Term Care focuses on products related to important care issues including assistance / nurse call, falls, wandering, incontinence, bathing, medication management, and resident lifts and transfers. As funding and resources permit, Technology for Long-Term Care will add more categories or “Care Issues”, expand existing categories by including more products, and provide supplemental resources. Examples of future care issue categories may include mobility, assistive cognition, eating, dressing, and leisure to name a few.

The contents provided on this Site are for information purposes only. IDEAS, Inc and Polisher Research Institute have not examined, reviewed, or tested any product, device, or information contained on this Site. The Technology for Long-Term Care website is intended to inform your purchasing decisions; products cannot be purchased through the site.

Select a Care Issue on the left hand side of the page to begin your search and compare related technologies.

Read the press release from the Department of Health and Human Services announcing the launch of Technology for Long-Term Care, June 16, 2004.

Customize Your Site
Use My Site to save recent searches and set custom site styles.
Browse Products by Care Issue

- Assistance Call
- Bathing
- Fall Management
- Incontinence
- Lifting and Transferring
- Medication Management
- Wander Management
Currently, www.TechforLTC.org contains information on over 950 long-term care specific products representing over 275 companies...
Assistance Call

This care issue, also known as nurse call or emergency call, includes technologies that enable a resident to summon assistance by means of a transmitter that they can carry with them or access from somewhere in their living area.

Related Resources About Assistance Call
Key Issues to Consider About Assistance Call

- Telephone Based Call Systems (15 products)
  Telephone based call systems use telephone lines to alert caregivers to a resident need.

- Wired Call Systems (42 products)
  Wired Call systems rely on wires for communication between the main components of the system.

- Wireless Call Systems (22 products)
  Wireless call systems require no wiring for installation.
Related Resources About Assistance Call

Below are literature reviews and research studies focused on older people in residential long-term care settings.

* Review articles are starred.

* review articles

General Resources

- **Article**
  
  Alexander GL. (2008). "A descriptive analysis of a nursing home clinical information system with decision support". Perspectives in Health Information Management / AHIMA, American Health Information Management Association, 5 (), 12-E0A.

- **Article**
  
  Heming J, Brayne C. (2008). "Inability to get up after falling.\n
- **Article**
  
Key Issues to Consider About Assistance Call

This care issue, also known as nurse call or emergency call, includes technologies that enable a resident to summon assistance by means of a transmitter that they can carry with them or access from somewhere in their living area.

- What assistance call options are available?
- How do we begin discussions in our facility about assistance call technologies?
- What are some of the features that call systems have to offer?
- What specific business concerns are important to consider when choosing among assistance call systems?
- What are the tradeoffs of assistance call systems with respect to various aspects of your residents' quality of life?
Assistance Call

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 › **Wireless Call Systems** (22 products)
   Wireless call systems require no wiring for installation.
<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodyguard by Pioneer Emergency Response</td>
<td>NA</td>
</tr>
<tr>
<td>By wearing a small, medical alert pendant around the neck, a person can have instant access (from any room of the house) to the button that will summon the paramedics.</td>
<td></td>
</tr>
<tr>
<td>Companion Services℠ Personal Response System</td>
<td>NA</td>
</tr>
<tr>
<td>The ADT® Companion Services℠ Personal Response System (PRS) features a wireless Personal Help Button that is worn on the wrist or as a pendant.</td>
<td></td>
</tr>
<tr>
<td>EarlyResponse Integration Software</td>
<td>NA</td>
</tr>
<tr>
<td>EarlyResponse Integration Software is a resident management system that integrates various manufacturers’ devices such as nurse call systems, Personal Emergency Response Systems (PERS) and wander prevention systems into a monitoring, notification and reporting system.</td>
<td></td>
</tr>
<tr>
<td>ElderLink™ 8000</td>
<td>NA</td>
</tr>
<tr>
<td>The ElderLink™ 8000 is a telephone dialer emergency response system designed for independent and assisted living facilities.</td>
<td></td>
</tr>
<tr>
<td>ExecuteOne Healthcare Communications Platform (HLC)™</td>
<td>NA</td>
</tr>
<tr>
<td>The ExecuteOne Healthcare Communications Platform (HLC)™</td>
<td></td>
</tr>
</tbody>
</table>
Companion Services℠ Personal Response System

Price or Price Range: NA

Description: The ADT® Companion Services℠ Personal Response System (PRS) features a wireless Personal Help Button that is worn on the wrist or as a pendant. This waterproof device can enable a senior to get emergency assistance from any room in virtually any home, day or night. It also works with a 2-way voice intercom, so an ADT® monitoring specialist, trained for Companion Services℠, can speak with the resident calling for assistance. If there is an emergency, the monitoring specialist can send help by calling and dispatching an ambulance or notify a relative or neighbor. The companion service requires a monthly service charge. As of April 2009 approximate activation fee is $99.00 and a monthly fee of $34.95/mo. Prices subject to change.

Quick links to buy products

ADT® Security Services, Inc.

Additional Product Information

Date Updated: 04/30/2009

Go to Product
## User Satisfaction

<table>
<thead>
<tr>
<th>Survey Items</th>
<th>Scale</th>
<th>High Score</th>
<th>N</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading speed</td>
<td>1-10</td>
<td>Ext. Satisfied</td>
<td>104</td>
<td>8.71(1.42)</td>
</tr>
<tr>
<td>Content of product descriptions</td>
<td>1-10</td>
<td>Ext. Satisfied</td>
<td>104</td>
<td>8.42(1.52)</td>
</tr>
<tr>
<td>“Compare products” feature</td>
<td>1-10</td>
<td>Ext. Satisfied</td>
<td>102</td>
<td>8.28 (1.81)</td>
</tr>
<tr>
<td>“Key Issues to Consider” general feature</td>
<td>1-10</td>
<td>Ext Satisfied</td>
<td>102</td>
<td>8.76 (1.53)</td>
</tr>
<tr>
<td>“Questions for Vendors” general feature</td>
<td>1-10</td>
<td>Ext. Satisfied</td>
<td>76</td>
<td>8.70(1.42)</td>
</tr>
<tr>
<td>“Related Readings” general feature</td>
<td>1-10</td>
<td>Ext. Satisfied</td>
<td>93</td>
<td>8.43(1.88)</td>
</tr>
<tr>
<td>Overall Satisfaction with Website</td>
<td>1-10</td>
<td>Ext. Satisfied</td>
<td>99</td>
<td>8.59(1.59)</td>
</tr>
<tr>
<td>Likelihood of Returning to Website</td>
<td>1-10</td>
<td>Ext. Likely</td>
<td>99</td>
<td>8.29(2.11)</td>
</tr>
<tr>
<td>Likelihood of Using Website to Make Purchase Decision</td>
<td>1-10</td>
<td>Ext. Likely</td>
<td>99</td>
<td>8.09 (2.17)</td>
</tr>
<tr>
<td>Likelihood of Recommending Website to Colleague</td>
<td>1-10</td>
<td>Ext. Likely</td>
<td>99</td>
<td>8.60 (1.91)</td>
</tr>
</tbody>
</table>
### Table 2: Means (SD) for Heuristic Domain Items

<table>
<thead>
<tr>
<th>Domain Items</th>
<th>Heuristic Items (range:1 (Completely disagree) to 5 (Completely agree with statement))</th>
<th>Range</th>
<th>Mean (SD) (N=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visibility of System Status</strong></td>
<td>When starting from the home page, it is obvious where I am and where I can go next.</td>
<td>1-5</td>
<td>4.88 (.34)</td>
</tr>
<tr>
<td></td>
<td>All the icons and/or navigation possibilities are visible and it is clear where they lead.</td>
<td>1-5</td>
<td>4.50 (.63)</td>
</tr>
<tr>
<td></td>
<td>It is clear what all the words on the page mean.</td>
<td>1-5</td>
<td>4.56 (.73)</td>
</tr>
<tr>
<td></td>
<td>It is clear what all the functional graphics are meant to do.</td>
<td>1-5</td>
<td>4.63 (.62)</td>
</tr>
<tr>
<td></td>
<td>The same words mean the same thing throughout the website.</td>
<td>1-5</td>
<td>4.56 (.63)</td>
</tr>
<tr>
<td><strong>Flexibility of Use &amp; Structural Integrity</strong></td>
<td>This site is free from empty areas or dead links.</td>
<td>1-5</td>
<td>4.56 (.63)</td>
</tr>
<tr>
<td></td>
<td>This site supports exploration.</td>
<td>1-5</td>
<td>4.69 (.79)</td>
</tr>
<tr>
<td></td>
<td>It is easy to remember the structure of the site.</td>
<td>1-5</td>
<td>4.63 (.72)</td>
</tr>
<tr>
<td><strong>Efficiency of Use</strong></td>
<td>The site accepts all user configurations.</td>
<td>1-5</td>
<td>4.25 (.86)</td>
</tr>
<tr>
<td></td>
<td>The response times of the site are of reasonable length.</td>
<td>1-5</td>
<td>4.88 (.34)</td>
</tr>
<tr>
<td></td>
<td>The site provides direct and clear access to the most common tasks one wants to perform.</td>
<td>1-5</td>
<td>4.88 (.34)</td>
</tr>
<tr>
<td><strong>User Control, User-Centered Design</strong></td>
<td>The user can completely control all of the interactive elements.</td>
<td>1-5</td>
<td>4.44 (.63)</td>
</tr>
<tr>
<td></td>
<td>The site supports all the tasks the user aims to perform.</td>
<td>1-5</td>
<td>4.38 (.89)</td>
</tr>
<tr>
<td></td>
<td>Users can get the desired information with minimal errors and backtracking.</td>
<td>1-5</td>
<td>4.69 (.60)</td>
</tr>
<tr>
<td><strong>Content and Presentation</strong></td>
<td>The amount of information about products on the site is about right.</td>
<td>1-5</td>
<td>4.50 (.73)</td>
</tr>
<tr>
<td></td>
<td>The quality of information on the site is high.</td>
<td>1-5</td>
<td>4.63 (.50)</td>
</tr>
<tr>
<td></td>
<td>The site seems to have been constructed and then left on its own (REVERSED)</td>
<td>1-5</td>
<td>3.31 (1.74)</td>
</tr>
<tr>
<td></td>
<td>The information presented on the website is just an adaptation of printed material (REVERSED)</td>
<td>1-5</td>
<td>3.31 (1.70)</td>
</tr>
<tr>
<td></td>
<td>The information presented is graphically acceptable &amp; easy to read.</td>
<td>1-5</td>
<td>4.69 (.60)</td>
</tr>
<tr>
<td><strong>Subjective Satisfaction, Communication, &amp; Help</strong></td>
<td>I feel like I am left to my own devices on this site (REVERSED)</td>
<td>1-5</td>
<td>3.38 (1.41)</td>
</tr>
<tr>
<td></td>
<td>This site is pleasant to use.</td>
<td>1-5</td>
<td>4.81 (.54)</td>
</tr>
<tr>
<td></td>
<td>This site encourages exploration</td>
<td>1-5</td>
<td>4.81 (.40)</td>
</tr>
<tr>
<td></td>
<td>It is easy to find help on this site.</td>
<td>1-5</td>
<td>4.63 (.50)</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td>23-155</td>
<td>102.56 (9.37)</td>
</tr>
</tbody>
</table>
Number of Visits to www.techforltc.org
What’s next?

Have begun to work on Phase 2 of the website designed to:

1) Add 6 new care issues
   - Mobility
   - Assistive cognition
   - Eating
   - Dressing
   - Wound and Skin Care
   - Leisure

2) Enhance educational content

3) Evaluate user satisfaction
   - Coming soon! Let us know if you would like to participate.
Introduction and Objectives

Beneficial Technologies

- Emerging technologies are having an ever greater impact on the field of aging, and no more so than in the area of community-based independent living

HealthTech

Center for Technology and Aging

Network on Environments, Services and Technologies

In this portion of the presentation we will:

1. Present forecasts of specific technologies and their relationship to the workforce

2. Discuss challenges and opportunities for using beneficial technologies to support the independence of older adults
HealthTech’s Research Methodology

- Literature Review
- Stakeholder Analysis
- Developer and Product Review

Expert Interviews → Expert Panel

Analysis → Forecasting → Validation → Diffusion

Webinars, Technology Profiles, Forecast & Trend Reports, Demonstration Projects, Education
# Challenges of the Aging and Persons with Disabilities

## Everyday Living Activities
- **ADLs:** bathing, dressing, grooming, transferring, feeding, toileting
- **IADLs:** using phone, taking meds, light housekeeping, preparing meals, managing finances, going outside alone
- Home and personal safety (fall prevention, wandering)
- Mobility
- Transportation

## Health Management
- Disease self-management
- Vision, hearing, sensory, motor
- Nutrition
- Vital signs
- Exercise
- Fatigue/sleep
- Cognitive function
- Care coordination

## Staying Connected and Supported
- Personal engagement
- Lifelong learning
- Social interaction
- Being supported by caregivers
- Leisure activities
- Emotional and spiritual well-being
Needs of the Aging and Persons with Disabilities:

Shared Needs:
- Health management
- Help with ADL, IADL
- Staying connected
- Supported, care coordination
Framework For Forecasts

- Service
- Consumer Experience
- Technology Development, Adoption, and Dissemination
- Settings and Facilities
- Business Models
- Workforce
- Regulations and Standards
- ICT
Trend: Consumers Drive The Adoption of Technologies

TREND

Boomers purchase technologies and services as family caregivers and continue to demand these same technologies and services as they age. Providers and payers expand their adoption of technologies and services that address medical needs due to persistent consumer demand and supporting translational research. Consider discrete technologies that are less intrusive, easier to use, and more flexible in personal-safety, monitoring, and remote-care applications for this consumer segment.

Important Technologies and Characteristics:

- Discreet technologies
- Personal safety
- Monitoring and sensors
- Safe designed housing
- Telehealth/Remote Care
Consumer Driven Technology Trend: Supporting Forecasts

Consumer Experience

• The desire to appear independent drives development of discreet technologies and services related to lifestyle needs.

  ▪ 0-2 years: Technologies with simple interfaces and minimal features appeal to older adults.
    • Example: GreatCall’s Jitterbug
  ▪ 2-5 years: Discreet and affordable wearable sensors are the major modality for collecting physiologic and personal data in remote monitoring applications.
  ▪ 5-10 years: Developers produce aesthetic and functional technologies to meet large Boomer market.
Consumer Driven Technology Trend: Supporting Forecasts

Service

• Technology develops to help older adults safely transport themselves, whether on foot, driving or public transportation.

  2-5 years: GPS-enabled cell phones are customized to help older adults navigate on foot and on public transportation.
  • Example: iPhone, Blackberry

  Geographical Information System (GIS) on cell phones enable older adults to map where they live relative to local services, to reroute public transportation to suit their needs, etc.

  5-10 years: Virtual reality driving simulators gain use in clinical practice to assess executive functions and make specific driving recommendations.
  • Example: Drexel University Applied Neuro-Technologies Lab’s Virtual Reality Driving Simulator, University of Florida’s Independence Drive Program
Consumer Driven Technology Trend: Supporting Forecasts

Settings and Facilities

• **Consumer demand for independent living drives senior living facility design.**
  
  0-2 years: Senior living facilities adopt cognitive fitness, sensor and monitoring technologies initially in more high-end housing.
  
  • Example: Eskaton’s National Demonstration Home
  
  2-5 years: Senior living facilities partner with universities to create learning communities
  
  • Example: Hebrew SeniorLife’s NewBridge on the Charles
  
  5-10 years: Design elements that promote physical and psychological well being become wide spread
Consumer Driven Technology Trend: Supporting Forecasts

Workforce

• **New roles emerge to navigate complex systems.**
  - 0-2 years: Roles of care coach/manager, ombudsmen, mentors, super-users expand and proliferate.
  - 2-5 years: Increased importance of and demand for web managers in complex service organizations.
  - 5-10 years: Systems integrators needed to manage increasingly interdependent operations: reimbursement, PHR/personal health info, supply chain and Durable Medical Equipment (DME)/equipment, social/gaming, and services.
The Growing Need for Direct-Care Workers

Between 2000 and 2030, the number of US elders will increase by 104% while **women aged 25 to 44** (the traditional source for direct care workers) **will increase by only 7%**.
The majority of direct-care workers are now employed in home- and community-based settings, and not in facility-based long-term care settings.

By 2016, home- and community-based direct-care workers are expected to outnumber facility workers by nearly two to one.
Consumer Driven Technology Trend: 
Supporting Forecasts

Information & Communication Technology

• **Sensors and monitoring technology evolve to be less intrusive, easier to use, and more flexible.**
  
  * 0-2 years: Due to the early stage of the development, the use of monitoring and sensing technologies is limited to a few simple and basic applications.
    
    • Example: Tunstall’s Falls Management System, QuietCare
  
  * 0-2 years: Monitoring of physiological data and personal data is done discreetly through wearable sensors.
  
  * 2-5 years: Environmental monitoring appliances are designed with plug-and-play capability to meet the evolving monitoring and support needs of consumers.
  
  * 5-10 years: Personal and environmental monitoring converge. Cell phones become the main data collection device.
Aging and Technology Use

Internet Penetration

- A third of seniors (age 65 and older) have the Internet at home.
- More than two-thirds (70%) of the next generation of seniors (50-64 year-olds) have gone online.

Internet Usage

51% of adults age 60-69 go online
- 88% use email
- 72% get health info
- 75% get hobby info
- 67% get news online

26% of adults age 70+ go online
- 86% use email
- 65% get health info
- 56% get hobby info
- 53% get news online

Broadband Use

- Those age 50 and over experienced a 26% growth rate in home broadband adoption from 2007 to 2008.
- Half of Americans between the ages of 50 and 64 have broadband at home. Some 19% of those 65 and older had home broadband access as of April 2008.

Cell Phone Use

- 50% of Americans age 65 and older have a cell phone.

What are they doing online?
Consumer Driven Technology Trend: Supporting Forecasts

Regulations and Standards

- Regulation changes lag despite pressure from older adults and persons with disabilities to adapt environments for accessibility.

  0-5 years: Higher visibility of environmental challenges for persons with disabilities brought by aging populations.

  5-10 years: Better access in public and commercial areas, but low-income housing remains a challenge because of the lack of market power.

  5-10 years: Housing developers begin going beyond code standards toward individualization for residents’ needs, but face challenges with local regulators.

  10+ years: ADA criteria expands to reflect the changing population.
Consumer Driven Technology Trend: Supporting Forecasts

Business Models

• **Willingness to pay for services out-of-pocket and lack of reimbursement cause technology developers to shift focus away from institutions to individual consumers.**

  • 0-2 years: Care-in-place and remote monitoring technologies continue to be paid for out-of-pocket.
    
    • Example: Centura Health at Home’s Home Care

  • 2-5 years: Community living facilities pay for inclusion of beneficial technologies in new construction, but pass the costs on to the consume.

  • 5-10 years: Fee-for-service bundled packages of technology and in-home technical support become available.

  • 5-10 years: commercially available technologies such as assistive devices and home health monitoring become widely available in retail store.
Baby Boomers as Caregivers for their Aging Parents

- More than 15 million take care of their aging parents
- Largest out-of-pocket expenses are for supervising care long distance
- Most Americans have no idea how much long-term care costs
- Never has old age lasted so long or been so costly
The Perfect Storm

Stakeholders, whether they are developers, policy makers, providers, or the consumers themselves, are all interested in the different ways of keeping this population healthy at home.

**Changing Demographics**
- Increased longevity
- Age wave
- Increased disability incidence
- Increased chronic disease among older adults
- Increased desire to lead independent lives at home

**Scarce Resources**
- Uncertainty of government safety net programs
- Uncertainty over individual financial security
- Overstretched healthcare $
- Workforce shortages

**Technologies for Independent Living**

**Technological Innovation**
The Challenge: Chronic Diseases and the U.S. Care Experience

Several themes predominate in the care management of U.S. residents with chronic diseases compared with residents of other nations with such conditions:

- High cost of care with an emphasis on high personal cost
- Medical errors
- Lack of access and continuity across sources of care

In Chronic Condition: Experiences Of Patients With Complex Health Care Needs, In Eight Countries, 2008

Chronic illness U.S. patients have the most negative access, coordination, and safety experiences.

by Cathy Schoen, Robin Osborn, Sabrina K.H. How, Michelle M. Doty, and Jordon Pough

ABSTRACT: This 2008 survey of chronically ill adults in Australia, Canada, France, Germany, the Netherlands, New Zealand, the United Kingdom, and the United States finds major differences among countries in access, safety, and care efficiency. U.S. patients were at particularly high risk of forgoing care because of costs and of experiencing inefficient, poorly organized care, or errors. The Dutch, who have a strong primary care infrastructure, report notably positive access and coordination experiences. Still, deficits in care management and hospital discharges in which nearly all patients incurred in all countries.

Findings highlight the need for system innovations to improve outcomes for patients with complex chronic conditions. [Health Affairs 28, no. 1 (2009): w1-w10 (published online 13 November 2008; 10.1377/hlthaff.28.1.w1)]

### Access, Coordination, and Safety

**Base: Adults with any chronic condition**

<table>
<thead>
<tr>
<th>Percent reported in past two years: Access problem because of cost*</th>
<th>AUS</th>
<th>CAN</th>
<th>FR</th>
<th>GER</th>
<th>NETH</th>
<th>NZ</th>
<th>UK</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access problem because of cost*</td>
<td>36</td>
<td>25</td>
<td>23</td>
<td>26</td>
<td>7</td>
<td>31</td>
<td>13</td>
<td>54</td>
</tr>
<tr>
<td>Coordination problem**</td>
<td>23</td>
<td>25</td>
<td>22</td>
<td>26</td>
<td>14</td>
<td>21</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>Medical, medication, or lab error***</td>
<td>29</td>
<td>29</td>
<td>18</td>
<td>19</td>
<td>17</td>
<td>25</td>
<td>20</td>
<td>34</td>
</tr>
</tbody>
</table>

* Because of cost, respondent did not get/take medications or stop taking them, visit a doctor when needed for a medical problem, or use a recommended test, treatment, or follow-up.  
** Test results were not available at time of appointment and/or doctors ordered test that had already been done.  
*** Wrong medication or dose, medical mistake in treatment, incorrect diagnosis/test results, and/or delays in abnormal test results.

Remote Patient Management Technologies: A Disruptive and Transformative Solution To A National Health Care Challenge

- Ill-equipped Healthcare system
- New business models emerge
- Remote patient management technologies an opportunity
- Remote patient management technologies a disruptive and transformative technology
- Balance needed between technology, policy and market interests
The Telehealth Process

Person interacts with telehealth device

Data collected includes:
- Vital signs (blood pressure, glucose meters, pulse oximeters, weight)
- Physical and emotional well-being assessment

Personal information is collected & transmitted

Data transmitted over:
- Video over low-bandwidth POTS
- Video over IP
- LAN/WAN
- Broadband

Caregiver or clinician receives data & uses

Results include:
- Enhanced communication between caregivers, providers, and patients leads to improvements in:
  - care coordination
  - caregiver support
- Reduce unnecessary visits
- Improve medication compliance
The Opportunity: RPM of patients with congestive heart failure

NEHI projections of savings using RPM:

- 60% reduction in hospital readmissions from standard care alone
- 50% reduction in hospital readmissions from DM
- Prevent 460,000 to 627,000 heart failure-related hospital readmissions/year
- NEHI estimates an annual national cost savings of up to $6.4 billion dollars.

Cost for Heart Failure patients

- $5,632 for RPM
- $11,387 for DM without RPM
- $13,468 for standard care

RPM net savings $3,703 / pt per year to disease management
The Early Adopter Experience: Veterans Health Administration

- The cost of the VHA Community Care/Health Technology program is $1,600/pt/yr

- Compares to direct cost of home-based primary care services of $13,121/pt/yr, and nursing home care market rate average of $77,745/pt/yr

- 43,430 patients enrolled

- VHA attributes its “systems approach” to the rapid adoption and value gain

Age Distribution of all CCHT Patients
Significant Barriers Remain to RPM Adoption and Diffusion

Principal barriers include:

- Limited experience of most providers with this technology
- Poor preparation for adopting such technologies
- Lack of financial models that document return on investment

NEHI updated its 2004 findings on barriers to RPM adoption in Remote Physiological Monitoring to include:

- Inadequate reimbursement
- Provider concerns
- Limited patient awareness.
- Information technology barriers
Better Health Care Together finds the US health care system could reduce costs by nearly $200 billion during the next 25 years if remote monitoring tools were utilized.

Estimated Savings and Gain from Policy Implementation, by Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Net Present Value of Savings – Baseline Case</th>
<th>Net Present Value of Savings – Policy Case</th>
<th>Gain From Policy Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF Patients</td>
<td>$79.7 Billion</td>
<td>$102.5 Billion</td>
<td>$22.8 Billion</td>
</tr>
<tr>
<td>Diabetes Patients</td>
<td>$42.3 Billion</td>
<td>$54.4 Billion</td>
<td>$12.1 Billion</td>
</tr>
<tr>
<td>COPD Patients</td>
<td>$18.7 Billion</td>
<td>$24.1 Billion</td>
<td>$5.4 Billion</td>
</tr>
<tr>
<td>Chronic Skin Ulcer Patients</td>
<td>$12.5 Billion</td>
<td>$16.0 Billion</td>
<td>$3.5 Billion</td>
</tr>
<tr>
<td>Total</td>
<td>$153.2 Billion</td>
<td>$197 Billion</td>
<td>$43.8 Billion</td>
</tr>
</tbody>
</table>

Ideal Technology Deployment: Stakeholder Alignment

**Government & Payers**
- Partial or Full Reimbursement
- Supportive Policy

**Health/Community Care Providers**
- Disease management & prevention focus
- Efficient & effective care coordination

**Vendors**
- Business model is affordable & scalable
- Underlying infrastructure in place

**Consumers and Staff**
- Consumer education & trust
- Staff/Caregiver buy-in

**Successful Technology Deployment**
Center for Technology and Aging

Initiative of The SCAN Foundation and HealthTech

- 3-year grant of $5 million to establish the nation’s first center devoted exclusively to advancing the use of technologies that enhance home and community-based care for seniors.

- Address the continuing challenge of adoption, expansion and sustainability of creative technologies that benefit the health and healthcare of older adults and the long-term care work force.

Goals

- Identify and evaluate best practices in the diffusion of emerging technologies.

- Serve as a state and national resource base for providers and policymakers who are engaged in the expansion of technology that improves the quality and efficiency of long-term care services.

- Develop supportive tools to accelerate adoption of technologies that improve the care and well being of older adults.
Center for Technology and Aging

Center for Technology and Aging Activities

- Grant program to test diffusion strategies starting in 2010
- Research and evaluation on adoption and diffusion strategies
- Technical assistance tools
- Policy and position papers that support the adoption and diffusion of beneficial technologies
- National dissemination of information concerning successful strategies and programs through web page, e-newsletter, fact sheets, white papers, and publications

The Center will focus on an array of technologies, including among others:

- Remote patient management
- Medication management
- Cognitive assessment
- Assistive technologies
- Caregiver communication
Questions & Answers: please submit using “chat”
Emerging Technologies and the Future of Independent Living

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