Technology Strategies and Readmissions

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Center for Innovation and Technology in Public Health

The Third National Medicare Readmissions Summit

Washington, D.C., June 13

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Public Health Institute

Center for Innovation and Technology in Public Health

- Established in 2009 when PHI acquired the Health Technology Center's intellectual property and human resources

- Mission: Accelerate the adoption and appropriate use of technology-enabled innovations in improving the public's health

- Independent research and evaluation group focusing on technology-enabled innovations to improve population health

Center for Technology and Aging

- Established in 2009 with funding from The SCAN Foundation, located at the Public Health Institute

- Mission: Expand the use of technologies that help older adults lead healthier lives and maintain independence

- Independent, non-profit resource center on issues related to diffusion of technology for older adults

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Reducing Rehospitalizations Through Innovative Technologies That Improve Care Coordination

This Commonwealth Fund-supported project involves a **two-year** effort:

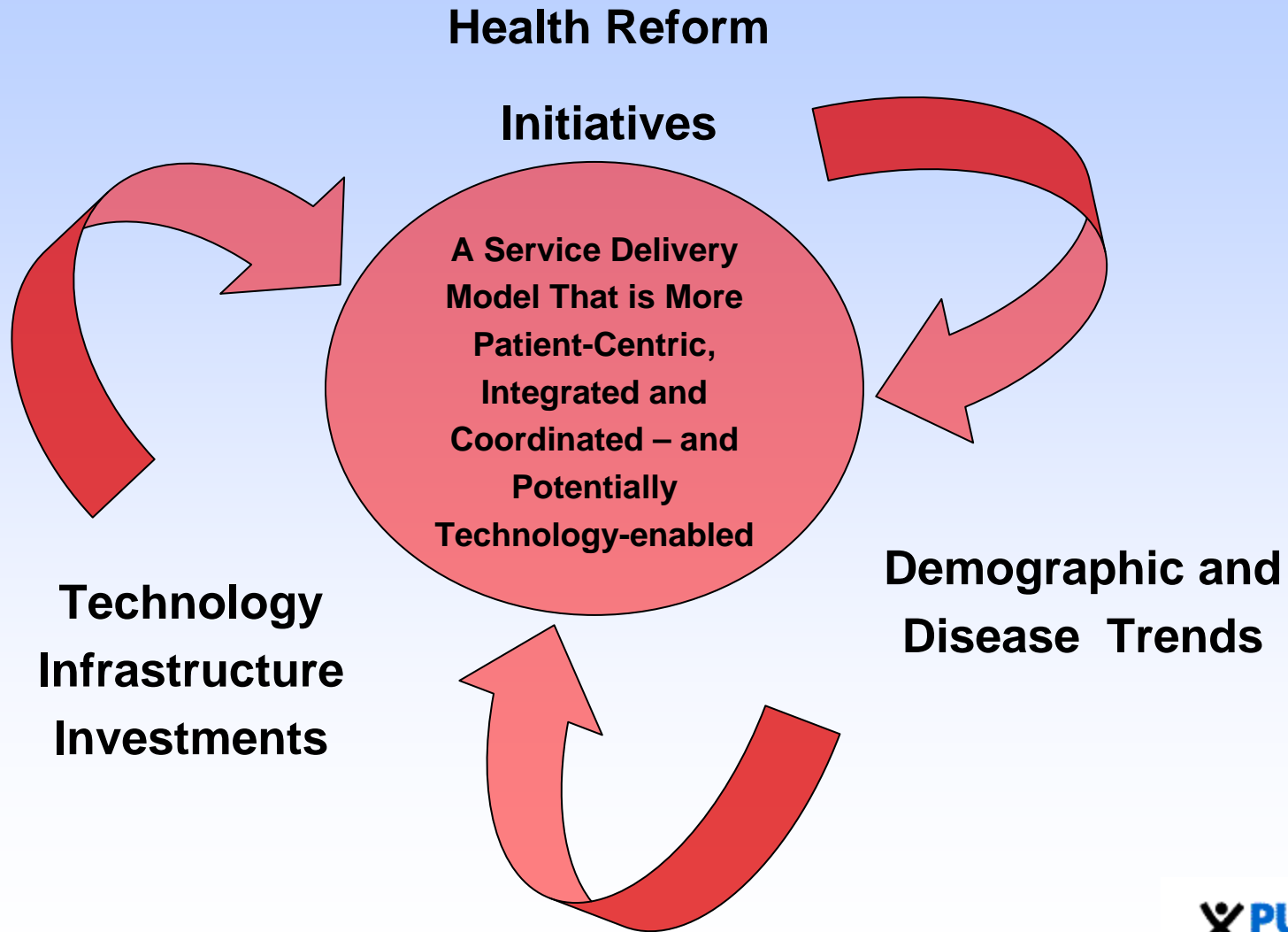| Process	Deliverables
Evaluation	• Working Paper
Business Planning	• Case Study • Tools
Operations	• Case Study

Center for Technology and Aging:
Diffusion Grant Program Areas

- Medication Optimization
- Remote Patient Monitoring
- Post Acute Care Transitions (Tech4Impact)
- mHealth

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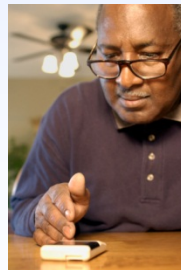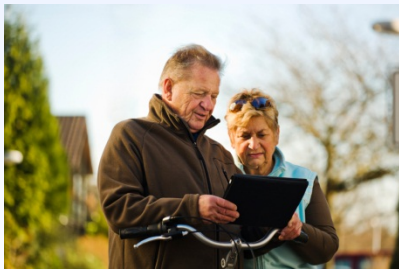
New Opportunities for Redesigning Care Delivery

Health Reform

Initiatives

A Service Delivery Model That is More Patient-Centric, Integrated and Coordinated – and Potentially Technology-enabled

Technology Infrastructure Investments

Demographic and Disease Trends

5

Preventable Readmissions:
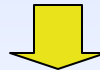# Current State and Future Implications

Challenges in care transitions

•Communication and care coordination

• Patient compliance with care plan

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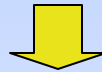
Improve care coordination, outreach and patient engagement

•Multidisciplinary team management

•Patient centered information

•Patient education and support

⬇

Technology-enabled processes that lend themselves to supporting

•Evidence-based care

•Care coordination

•Patient-provider communications

•Self-management

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Transitional Care Interventions

- The Care Transitions Intervention
- "The Coleman Model"
- Qualifications: CTI Coach can be layperson
- Length of intervention: 30 days
- Average cost: $196 per patient
- Steps:
  - Four pillars--Medication management; Patient-centered record; Follow-up; Red flags
  - Five encounters--Hospital/SNF Visit; Home Visit; 3 Follow-Up Calls

- The Transitional Care Model
- "The Naylor Model"
- Qualifications: Transitional Care Nurses are advanced practice nurses
- Length of intervention: 1 to 3 months
- Average cost: $982 per patient
- Steps:
  - Visit patient in hospital, home visit w/24 hours, accompany patient to 1st doctor visit, facilitate clinician collaboration and communications with patient/family, on call 7 days a week

Transitional care interventions rarely encourage the use of a specific technology

Self-Management Education

Technology has facilitated broader diffusion of the original innovation in community-based self-management English- and Spanish-language programs for persons with chronic conditions:

- Online training workshop
  - Better Choices, Better Health
- Key features
  - Six week, highly-interactive, small-group workshop
  - Two peer moderators per workshop
  - Participation involves about two hours per week
  - Participants do not need to log on at the same time
- Licensed by National Council on Aging
  - Pilots underway in 7 states

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Coordinated Care

The Medicare Care Coordination Demonstration found six key components that distinguished successful programs:

- **Target patients at substantial risk** of hospitalization

- **Regular in-person contacts** with patient by care coordinator

- **Access to timely information** on hospital/ER admissions

- Co-location to facilitate occasional **interaction of care coordinators and physicians**

- **Same care coordinator for all of physician's patients**

- Strong **patient education**, guidance on taking medication, and **social supports**
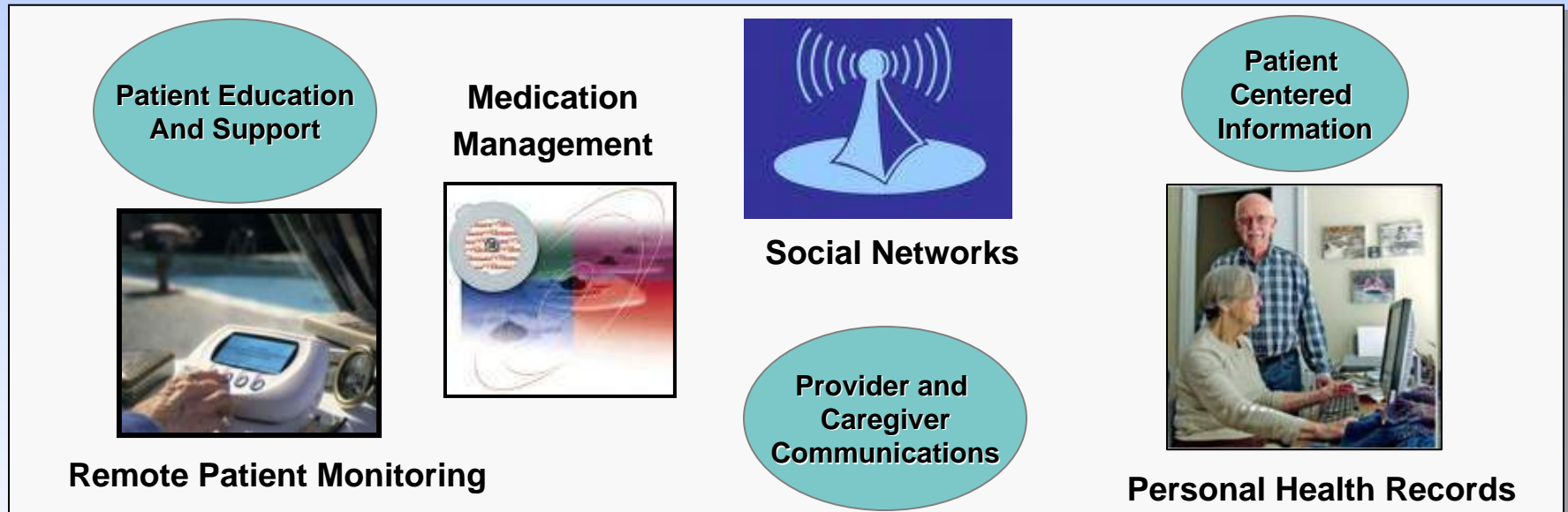
THE PROMISE OF CARE COORDINATION

Models that Decrease Hospitalizations and Improve Outcomes for Medicare Beneficiaries with Chronic Illnesses

A REPORT COMMISSIONED BY
THE NATIONAL COALITION ON CARE COORDINATION (N3C)

By Randall Brown, Ph.D., Mathematica Policy Research, Inc.

March 2009

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The Potential Contribution of Multiple Technologies

Patient Education And Support

Medication Management

Social Networks

Patient Centered Information

Remote Patient Monitoring

Provider and Caregiver Communications

Personal Health Records

Technology options should be considered if appropriate and they lead to care coordination that is efficient, effective and satisfying for patients and providers

Interactive Consumer Health IT: Barriers and Drivers to Use

The greatest positive effect on patient care processes and outcomes is found when a complete feedback loop is provided between physician recommendations and patient actions through the following functions:

- Monitoring current health status

- Interpretation of data in light of established, individualized treatment goals

- Adjustment of the care management plan as needed

- Communication back to the patient with tailored recommendations or advice

- Repetition of this cycle at appropriate intervals

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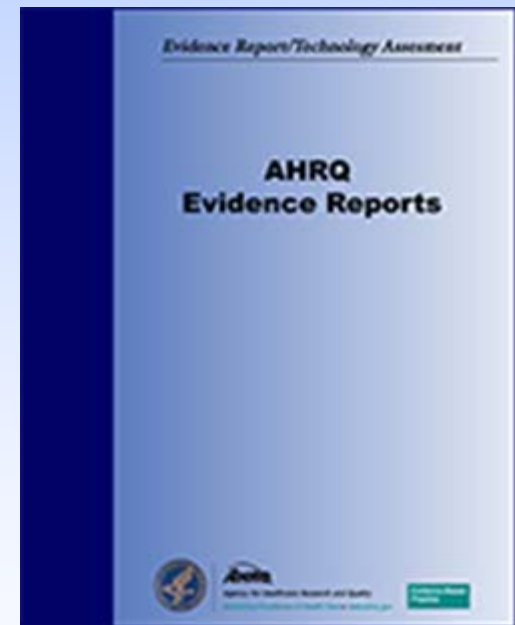
Remote Health Services and Health IT

Interactions where patient and provider are physically separate but virtually connected to facilitate patient data collection and transmission to improve care coordination and communications and to actively support remote patient care.

Person interacts with telehealth device → **Personal information is collected & transmitted** → **Care team reviews data & follows up as appropriate**

Data collected includes:

- Vital signs monitoring (blood pressure, blood glucose levels, pulse, weight; etc)

- Physical, behavioral, and cognitive well-being assessments

Data transmitted over:

- Video over low-bandwidth POTS

- Video over IP

- LAN/WAN

- Broadband

Results include:

- Improvement in care coordination and caregiver support

- Reduction in unnecessary visits and hospitalizations

- Improvement in medication compliance and treatment outcomes

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Remote Patient Monitoring:
Monitoring, Evaluation, and Management

RPM performs a range of capabilities, including:

– Monitoring of therapeutic processes

– Tracking of health and preventive behavior

– Managing chronic disease and post acute care

– Improving self-management role

– Supporting patient needs with daily life and personal safety

Remote Patient Monitoring:
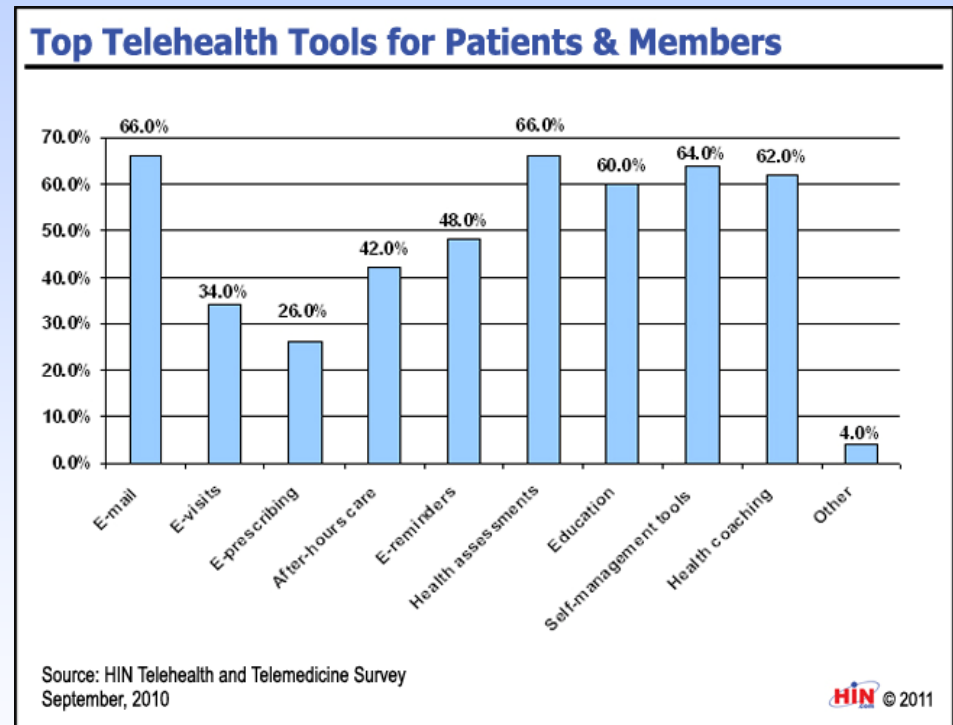# Patient Self-Management Tools and Skills

The ability to engage and activate patients and augment their self-management skills is critical to the value of integrated RPM devices:

RPM capabilities	Resultant Support via Technology
Managing therapeutic processes	- Disease knowledge - Vital signs and self-reporting - Take medication - Rules of conduct - Physiotherapy
Managing health and preventive behavior	- Nutrition - Physical exercise - Cognitive exercise - Social interaction - Stress reduction
Managing the role of the chronically ill patient	- Dynamics of health status and disease progress - Navigating the health care system - Relationship to health care professionals - "Action plans"
Managing daily life	- Maintain autonomy in daily life - Deal with disease related implications - Support in daily life by friends, family members and informal helpers
Managing crises	- Be prepared for crises - Recognize crises - Call for help

Remote Patient Monitoring:
Targeted Applications

Targeted Health Conditions
Monitored Remotely*

- Heart failure 77.1 percent

- Diabetes 74.3 percent

- COPD 54.3 percent

- Med adherence 54.3 percent

- Asthma 42.9 percent

Top Telehealth Tools for Patients & Members

Tool	Percent
E-mail	66.0%
E-visits	34.0%
E-prescribing	26.0%
After-hours care	42.0%
E-reminders	48.0%
Health assessments	66.0%
Education	60.0%
Self-management tools	64.0%
Health coaching	62.0%
Other	4.0%

Source: HIN Telehealth and Telemedicine Survey
September, 2010

HIN © 2011

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Technologies to Support Caregiver Communications

| Challenge	Solution	Example Technology
Medication Management	Medication Reconciliation and Adherence	Medication Optimization
Fragmentation of Information on Patient	Patient-centered Record	Personal Health Record
Patient Adherence to Care Plan	Patient Education and Support	Online Social Networks
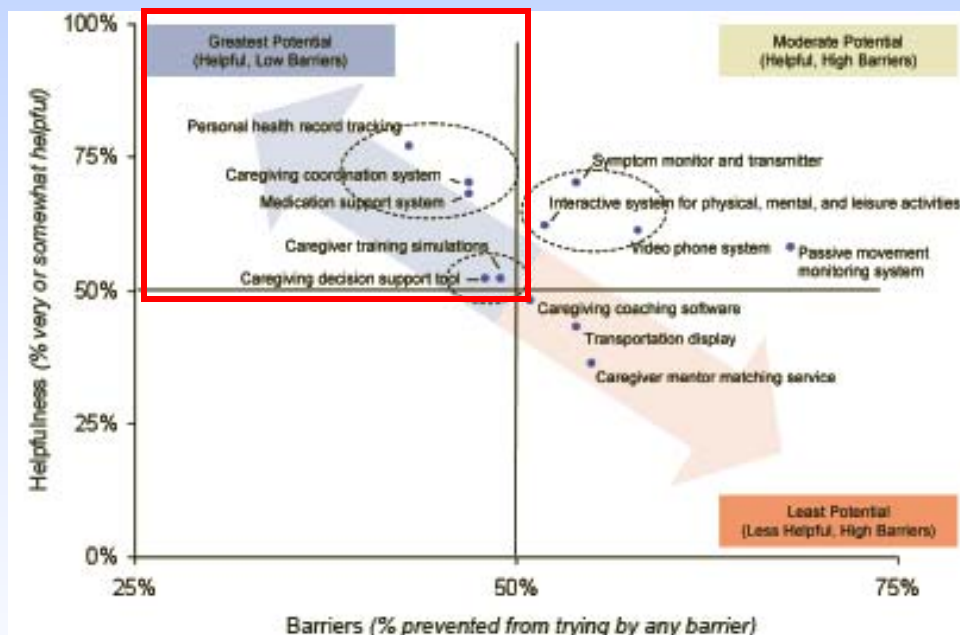
Source: United Healthcare/National Alliance for Caregiving (2011)
E-Connected Family Caregiver: Bringing Caregiving into the 21st Century

Personal Health Records

- **Improved outcomes for patients**
- **Improved clinician efficiency**
- **Consumer Empowerment**
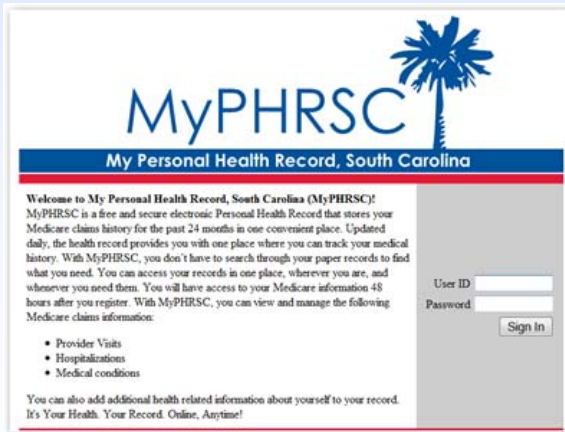
Washington State Unit on Aging
# CTA Tech4Impact Grant Project

Improving
- Communications
- Coordination
- Self-management

During Care Transitions

via EHRs and PHRs

Focus Area	**Improving communications, coordination, self-management during care transitions**
Population	**Patients recently discharged from hospital that are participating in the Care Transitions Intervention program**
Technology	**EHRs and PHRs**
Expected Benefits	**Reduce hospitalizations/re-hospitalizations, improve patient self-management, improve communications**
Workforce Issues	**CTI coach, connected clinicians, increased engagement of patients and caregivers**
Organizational Readiness	**An early adopter, Whatcom County, WA started project in 2001**
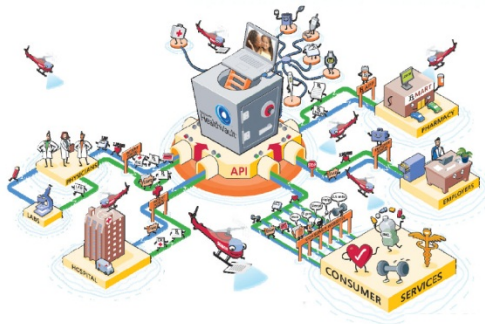
Medication Management Systems:
A Prime Target, Broader Population Than RPM

- Medication errors are mostly made at the "interfaces of care"

- Poor management compromises patient safety, and results in unnecessary care

- Solutions focus on three key process steps to optimize patient outcomes
  - Reconciliation
  - Adherence
  - Monitoring

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Medication Optimization

Medication Reconciliation		Medication Adherence		Medication Monitoring
Assess >	**Prescribe** >	**Dispense** >	**Administer** >	**Monitor** >
Goals •Patient history includes a complete and accurate medication list •Patient needs are accurately conveyed and understood	**Goals** • Medication orders are documented and shared with patients	**Goals** • Medication is made available • Medication picked up by patient • Patient and caregivers understand medication instructions	**Goals** • Individual dose dispensed • Individual dose taken by patient (on time, in the right does, and for the right length of time)	**Goals** • Routine dosing and tracking of medication • Reports and trending information from medication log generated • Clinician adjusts medication as needed • Prescriptions refilled
Example Technologies •Medication List Software •Personal Health Records (PHR)	**Example Technologies** •Medication List Software •Personal Health Records (PHR)	**Example Technologies** •Teleconsultations •Online Patient Education •Cognitive Assessment Tools •Pharmacy Kiosks	**Example Technologies** •Medication Adherence Devices (integrated and standalone, simple and advanced function)	**Example Technologies** •Personal Biometric Testing Devices •Wireless Communication Devices •Personal Health Records (PHR)

Technologies to Improve Medication Reconciliation Problems

One-time entry Medication List – electronic or paper

Name	Organization	Description
My Medication Log	Cardiovascular and Public Health Detailing Programs	A medication log for use in the Cholesterol Action Kit ihttp://www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/Tools/MyMedicationLog.htm
Universal Medication Form	McLeod Health in Florence, SC	A form where patients can enter medications used, allergies, and immunization records
Health and Safety Passport	California Pacific Medical Center, San Francisco	Patients list their medications, health history, and other relevant information
Med List	A statewide, collaborative initiative in Massachusetts	Medication list to keep track of patient medications and supplements. Also offers tips for using medications wisely.
My Medicine List	ASHP	A tool where patients can develop and manage their own medication list. The tool can be found on the ASHP Foundation website
Pill Card	AHRQ	Information on how to develop an easy-to-use "pill card" for patients, parents, or anyone who has a hard time keeping track of their medicines at http://www.ahrq.gov/qual/pillcard/pillcard.htm
My Medicine Record	FDA	Patients list prescription medicines, over-the-counter medicines and dietary supplements. http://www.fda.gov/cder/consumerinfo/my_medicine_record.htm

Continuous Electronic Medication List and Personal Health Records

- Walgreens has partnered with Microsoft® HealthVault™, a web-based PHR platform, giving Walgreens pharmacy patients the ability to upload their medication history into HealthVault and share this information with caregivers, clinicians, and others

Technologies to Improve Medication Adherence Problems

Category	Description	Sample Techs	Pros	Cons	Market Stage	Economics
Single-Function	Performs one function currently available within the medication adherence technology spectrum	•iGuard •Timex messenger •Rex Pill bottle •Gentle Reminder	Simplest and easiest to use technologies	•Lacks greater functionality for more comprehensive health management	Many technologies out on the market and currently used	•Usually a one-time purchase •Prices can vary widely •Relatively inexpensive
Multi-Function	Performs two or more functions currently available within the medication adherence technology spectrum	•EMMA •Philips Medication Dispensing Service •MedSignals •uBox •Dispense-a-Pill	•Mostly easy to use •Integrates multiple functions for better health management	•May be complex or require greater caregiver involvement •Lacks functionality for more comprehensive management	Many technologies out on the market and currently used	•Usually a one-time purchase •Prices can vary widely (less than $100 to $1000+)
Advanced Function	Performs one or more of the currently available spectrum functions and can also perform one of the more advanced functions	•MagneTrace •Xhale's SMART™	•Advanced technologies allow actual tracking/adjustment/ingestion of medication •Integrates multiple functions	•Considerably more complicated than single/multi function without clear benefit understanding •In some cases, may lack comprehensive management functionality	Most technologies still in development	•Currently unclear - most technologies still in development •May be relatively expensive
Integrated with Health Management Capabilities	Technologies that integrate medication administration with other health-related management functions (i.e. monitoring, sensors, independent living assistance)	•Med-eMonitor •HealthHero •Home HealthPoint •Zume Life Zuri •Intel HealthGuide	•Combined offering allows for broad patient management •Many devices likely to move towards integration of health tracking/monitoring	•Relatively complicated, may require caregiver involvement •May require greater tech knowledge	•Some techs currently on market and used •Other techs in development	•Usually upfront cost plus a monthly fee (service-oriented model) •Upfront cost can be relatively high

CTA Grantees:
Medication Optimization Technologies

- **Computerized Pill Dispensers**

  Grantee: Caring Choices

- **Video, Spoken Format Technologies**

  Grantee: Connecticut Pharmacists Foundation, Khmer Health Advocates

- **Computer Algorithms that Analyze Medications and Medication Use**

  Grantees: VA Central California, VNSNY, ASCP Foundation

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Mobile Technologies to Support Caregivers

- **78%** of adults aged between **50 – 64 years** and **82%** of those between **65 and 74 years** of age have a cell phone

- **Laptop or tablet computer** ownership among adults over the age of 50 reached **42%** in early 2010.

- **Tracking of a care recipient's need for help** involving a mobile platform is currently used by **3% of caregivers**

- **3% of caregivers** use mobile technologies to track health indicators, while **37%** would like to have this supportive tool

mHealth Technologies
Potential Applications, Examples and Outcomes

Technology Applications	Example Technologies	Potential Outcomes
▪ Chronic disease management ▪ Medication adherence ▪ Location and safety tracking ▪ Access to personal health information ▪ Communications between and among clinicians, patients, and informal caregivers ▪ Wellness	▪ Chronic disease remote patient monitors with mobile alert systems, dashboard access via internet ▪ Medication reminders and safety alerts via text, email, or smartphone application ▪ Safety and location tracking systems ▪ Personal health records ▪ Web-based social networking ▪ Nutrition, activity, and quality of life web-based monitoring systems	▪ Reduced hospitalizations ▪ Increased patient satisfaction ▪ Reduced costs ▪ Aging in place and nursing home diversion ▪ Increased self-management ▪ Improved health and wellness ▪ Increased quality of life ▪ Decreased caregiver burden ▪ Increased communication and coordination between patients, clinicians, and caregivers

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Online Social Network:
Communities of Support and Care Coordination

Online social networks focus on building communities of interest that help older adults communicate, organize, and share with other older adults and with their care providers, and can be used by caregivers and clinicians to coordinate care.

CTA Diffusion Grants Programs Lessons Learned

- **Technology is 10% of the Issue**
- **90% of technology deployment and adoption is:**
  - Organizational leadership
  - Organizational familiarity with change management
  - Patient selection
  - Staff and patient training in deployment
  - Work flow processes
  - Technology deployment strategy
  - Communication and use of data