
Technologies for Improving Post Acute Care Transitions: Background



Andrew Broderick

Research Program Director

**Center for Innovation and Technology in Public
Health, Public Health Institute**

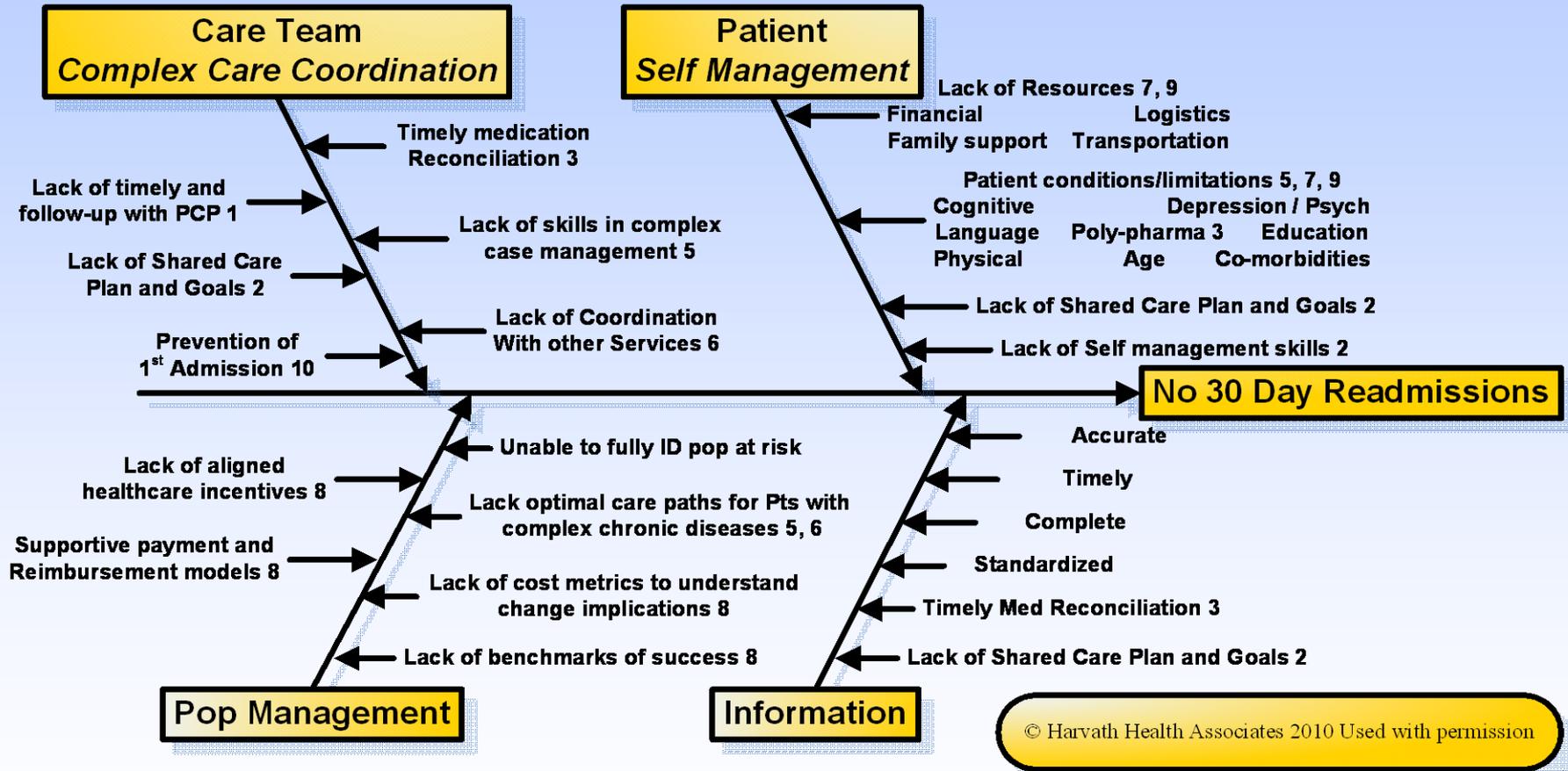


ARC Learning Session

Avoid Readmissions Through Collaboration

Oakland, CA January 19, 2011

Issues surrounding the risk for readmissions



Numbers denote references (next page)

Issues surrounding the risk for readmissions

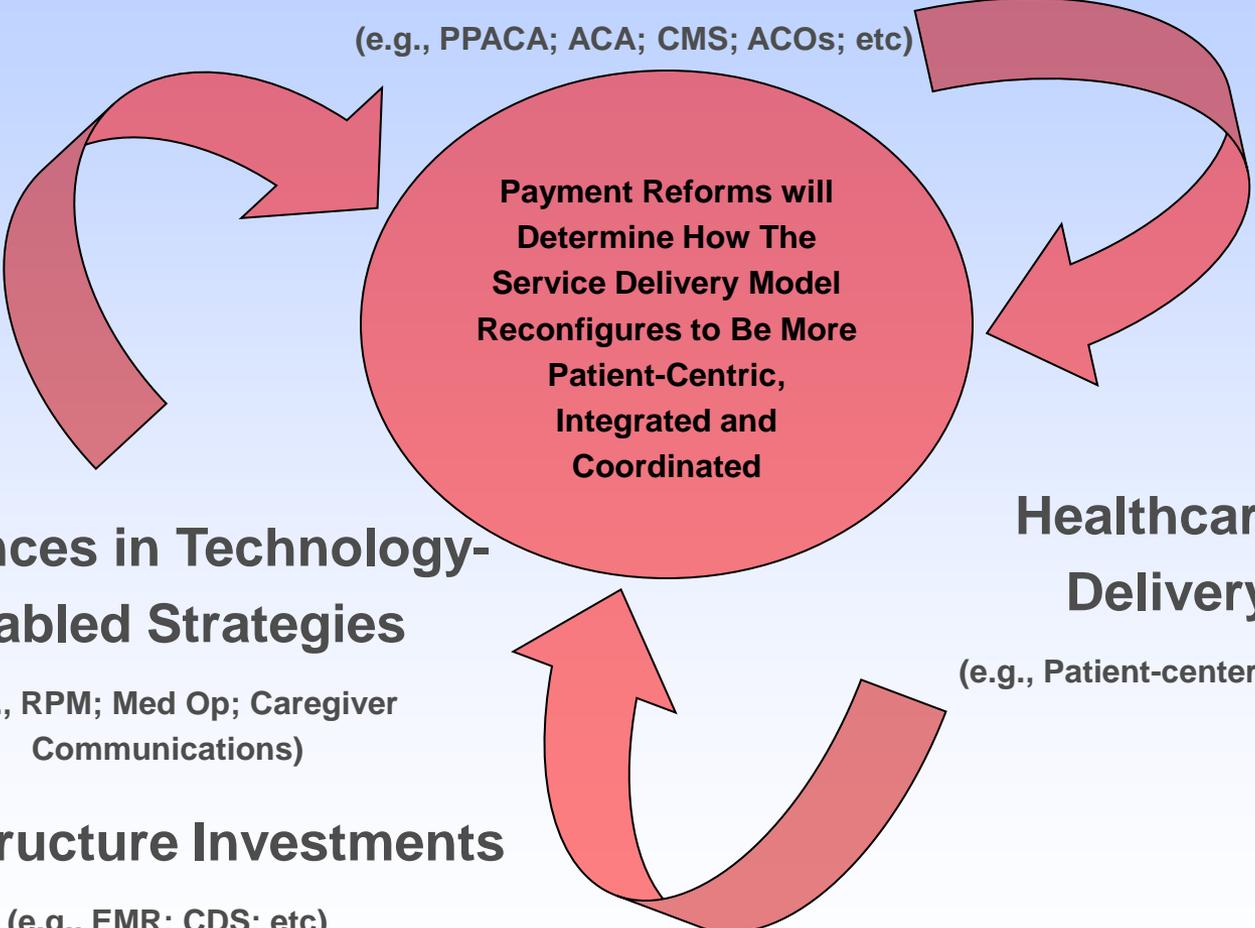
Literature References

1. New England Journal of Medicine, Jencks S, et al “Rehospitalizations among patients in the Medicare fee-for-service program” *N England Journal of Medicine* 2009; 360: 1418-28.
2. Kate Lorig, interview on patient self-management research November 2008.
3. Guharoy, R. et al. “Incidence of ADEs in patients readmitted within 30 days of discharge in a tertiary care teaching hospital,” *Formulary Journal of Modern Medicine*. Dec 2007.
4. Silverstein, M. et al. “Risk Factors for 30-Day hospital Readmissions in Patients \geq 65 years of Age.” *Baylor University Medical Center Proceedings*, Vol. 21, No. 4 pp. 363-72.
5. Naylor, M.D. et al. “Comprehensive Discharge Planning and Home Follow-up of Hospitalized Elders,” *Journal of the American Medical Association*, Vol. 281, No. 7, February 17, 1999, pp. 613-20.
6. Coleman, E. et al, “The Care Transitions Intervention,” *Archives of Internal Medicine*, Vol. 166, 2006, pp. 1822-8.
7. Schmittiel J. et al. “Why Don’t Diabetes Patients Achieve Recommended Risk Factor targets? Poor Adherence versus Lack of Treatment Intensification,”
8. Pham, H.H. et al. “Care Patterns in Medicare and Their Implications for Pay for Performance,” *New England Journal of Medicine*, Vol. 356, No. 11, March 15, 2007, pp. 1130-9 and Epstein A “Revisiting readmissions – changing the incentives for shared accountability” *N Eng J Med* 2009; 360: 1457-59.
9. Robyn Golden of Rush University Hospital, interview on readmission research from both their program and the BOOST program June 2010.
10. Source: ARHQ study “Patients with initial preventable condition (2004 study)” (20% readmissions were from preventable first admissions)

New Opportunities for Redesigning Care Delivery

Payment Reform and Increased Focus on Efficiency and Quality

(e.g., PPACA; ACA; CMS; ACOs; etc)



Payment Reforms will Determine How The Service Delivery Model Reconfigures to Be More Patient-Centric, Integrated and Coordinated

Advances in Technology-enabled Strategies

(e.g., RPM; Med Op; Caregiver Communications)

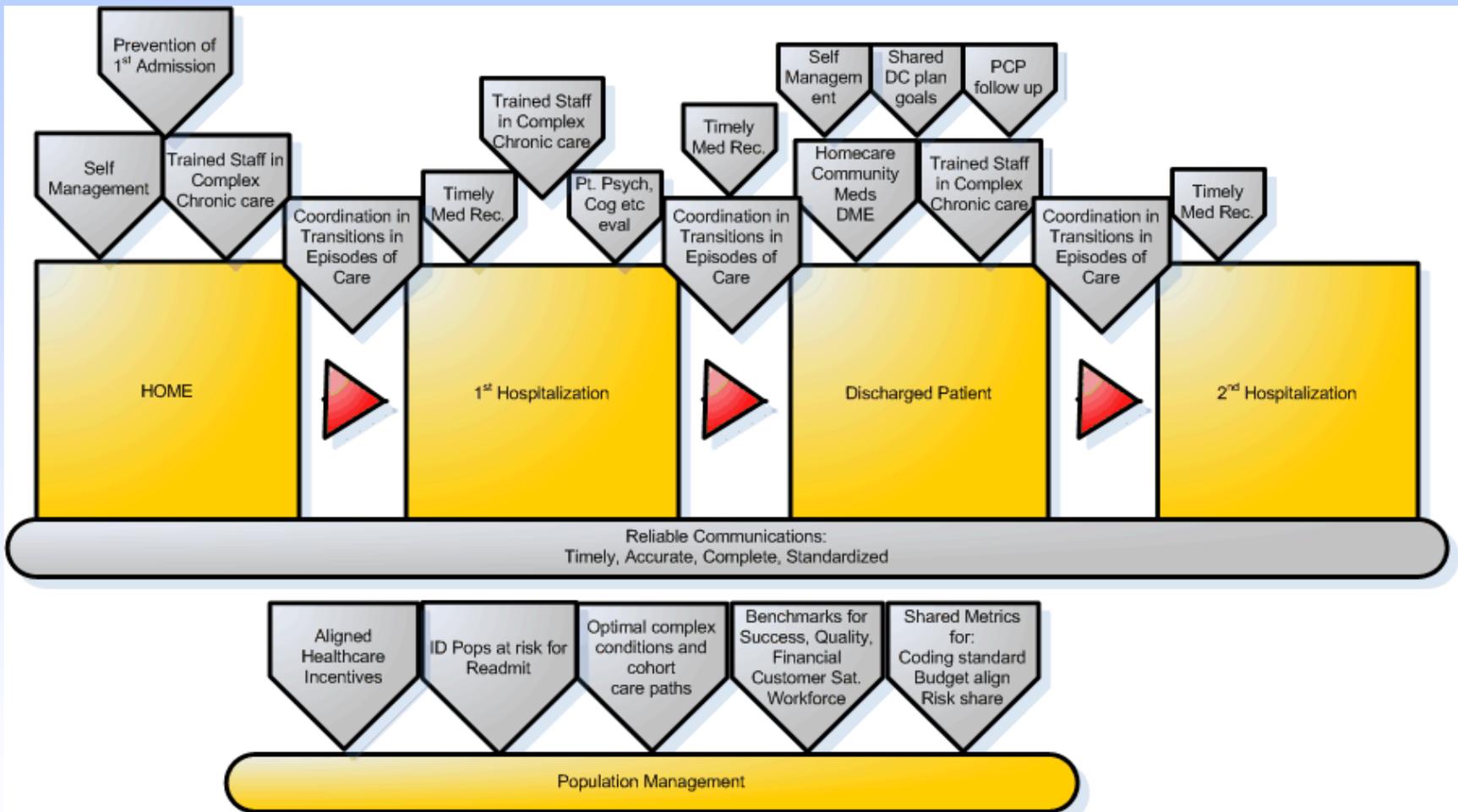
Infrastructure Investments

(e.g., EMR; CDS; etc)

Healthcare Service Delivery Model

(e.g., Patient-centered Medical Homes)

Issues in readmissions by process steps



© Harvath Health Associates 2010 Used with permission

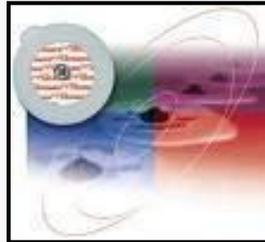
The Potential Contribution of Multiple Technologies

Video-Based
Education



Remote Home Management

Smart Sensors



Wireless Broadband
Networks

Home
Medication
Management

Telemedicine



Cognitive Assessment

Which technologies will have the biggest impact on 30 day readmissions?

Reducing Rehospitalizations Through Innovative Technologies That Improve Care Coordination

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

We propose **three core research products**:

- 1) **Working papers** on the potential impact of technology-enabled innovations
- 2) **Case studies** that demonstrate their successful diffusion into the delivery system to improve integration of care
- 3) **Tools and other resources** to support health care organizations in the selection and broad-based diffusion of proven innovations

The project work will be conducted with an **Advisory Board** comprised of the following:

- Leading **national organizations and thought leaders** in the health policy arena and **major care delivery systems**
- Expertise from within the **Public Health Institute**, including senior advisors, the Center for Technology and Aging, and the Center for Connected Health

Project Objective

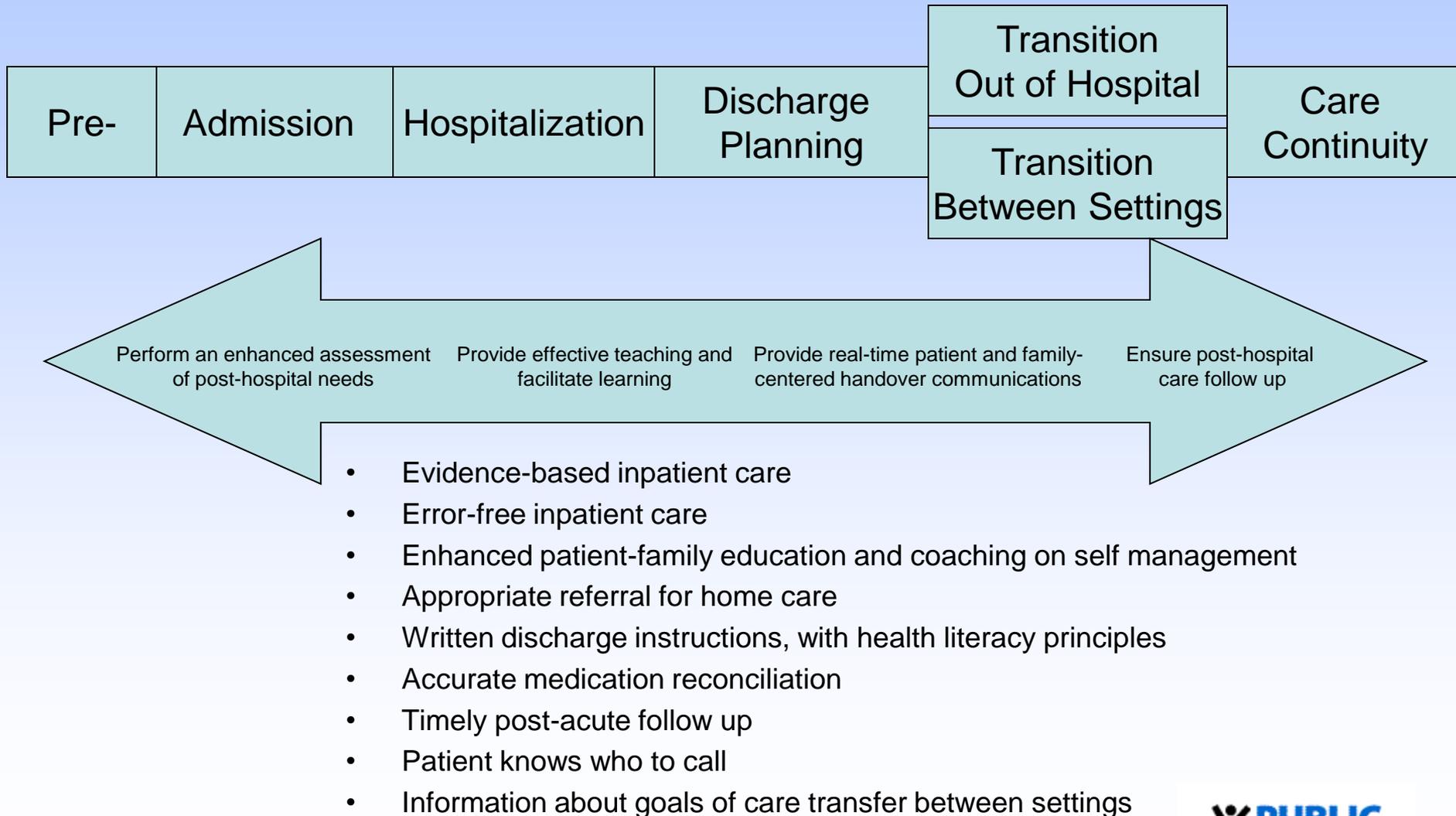
To build an **infrastructure that supports the adoption, diffusion and sustained use of technology-enabled innovations** into care delivery systems to prevent hospital readmissions

Key elements of the infrastructure include **evaluation and decision-making, business planning, and operational processes** that will enable organizations to do the following:

- Identify and select promising technology-enabled innovations
- Understand the impact of business models and incentive structures on technology adoption and financial performance
- Develop strategies that successfully deploy and sustain innovations at a large scale

The targeted impact of technology-enabled innovations will be to improve care outcomes through an **integrated model of care that facilitates coordinated care management processes**

Project Goal: Align Technology with Proven Strategies to Improve Transitions in Care



Remote Health Services

RHS are patient care interactions where patient and provider are physically separate but virtually connected through telecommunications, IT, and sensor technology. RHS facilitate data collection and transmission to improve care coordination and communications and to support patient care applications.



Person interacts with telehealth device

Data collected includes:

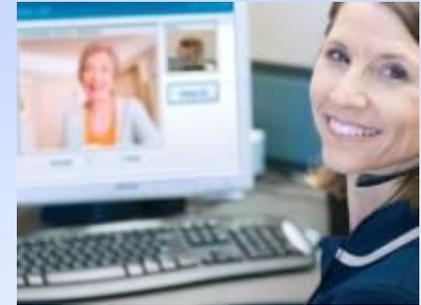
- Vital signs (blood pressure, glucose meters, pulse oximeters, weight)
- Physical and emotional well-being assessment



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:

- Improvement in care coordination and caregiver support
- Reduction in unnecessary visits and hospitalizations
- Improvement in medication compliance and treatment outcomes

Remote Patient Monitoring

- **Remote patient monitoring (RPM) is a specific application within RHS**
- RPM facilitates data collection and transmission to improve care coordination processes, reduce unnecessary resource utilization, improve patient and provider satisfaction, support self-management, and improve care outcomes:
 - Provides **messaging, monitoring and measurement, and interactive communications functions**
 - Use relies on a **reorganization of care processes** (involving newly defined roles, a disruption of existing business models, and a reduction in the use of traditional hospital-based care services)
 - The **Veterans Health Administration and smaller trials at fully-integrated provider-based plans** have demonstrated the greatest success to date in adopting and deploying RPM-enabled programs
 - The **VHA attributes the success of its implementation to the “systems approach”** taken to integrate the clinical, educational, technical, business, and organizational elements of the program
- It is difficult to assess the isolated effect of RPM on reducing rehospitalization rates (results range from low of 14% to a high of 80% reduction)*

*Source: Institute for Healthcare Improvement

The Early Adopter Experience: Veterans Health Administration (1 of 2)

- VHA has evaluated, piloted, reevaluated, and deployed RPM technologies in a continuing process of learning and improvement far beyond adoption in the private sector
- Currently, there is no program elsewhere in the US of the size and complexity of VHA's national program to enable detailed comparison
- Home telehealth programs drive substantial benefits as alternatives to traditional care models:
 - Findings from comparative studies conducted on patients enrolled in the VA's Care Coordination/Home Telehealth program in 2006 and 2007 show:
 - 25% reduction in bed days of care
 - 20% reduction in numbers of admissions
 - 86% mean satisfaction score rating



Care Coordination/Home Telehealth: The Systematic Implementation of Health Informatics, Home Telehealth, and Disease Management to Support the Care of Veteran Patients with Chronic Conditions

Adam Darkins, M.D., Patricia Ryan, R.N., M.S., Rita Kibb, M.N., A.P.R.N., Linda Foster, M.S.N., R.N., Ellen Edmondson, R.N., M.P.H., Bonnie Wakefield, Ph.D., R.N., and Anne E. Lancaster, B.Sc.

Department of Veterans Affairs, Office of Care Coordination Services, Washington, D.C.

Abstract

Between July 2003 and December 2007, the Veterans Health Administration (VHA) introduced a national home telehealth program, Care Coordination/Home Telehealth (CCHT). Its purpose was to coordinate the care of veteran patients with chronic conditions and avoid their unnecessary admission to long-term institutional care. Demographic changes in the veteran population necessitate VHA increase its noninstitutional care (NIC) services 100% above its 2007 level to provide care for 110,000 NIC patients by 2011. By 2011, CCHT will meet 50% of VHA's anticipated NIC projections. CCHT involves the systematic implementation of health informatics, home telehealth, and disease management technologies. It helps patients live independently at home. Between 2003 and 2007, the census figure (total prevalence) for VHA CCHT patients increased from 2,000 to 31,570 (1,500% growth). CCHT is now a routine NIC service provided by VHA to support veteran patients with chronic conditions as they age. CCHT patients are predominantly male (95%) and aged 65 years or older. Since criteria determine patient eligibility for enrollment into the program and VHA internally assesses how well its CCHT programs

meet standardized clinical, technology, and managerial requirements, VHA has trained 5,000 staff to provide CCHT. Routine analysis of data obtained for quality and performance purposes from a cohort of 17,025 CCHT patients shows the benefits of a 25% reduction in numbers of bed days of care, 19% reduction in numbers of hospital admissions, and mean satisfaction score rating of 86% after enrollment into the program. The cost of CCHT is \$1,600 per patient per annum, substantially less than other NIC programs and nursing home care. VHA's experience is that an enterprise-wide home telehealth implementation is an appropriate and cost-effective way of managing chronic care patients in both urban and rural settings.

Key words: home telehealth, chronic care, outcomes, patient satisfaction, veterans

Introduction

The Veterans Health Administration (VHA) within the U.S. Department of Veterans Affairs is a large integrated health-care system. VHA currently delivers healthcare services that serve 5.6 million unique veteran patients annually. A total of 7.6 million veterans are enrolled to receive VHA care.¹ The number of veteran patients aged 65 years or more that VHA treats is set to triple by 2011 compared to 2000 (Fig. 1).

As the U.S. population ages, people are living longer,² staying healthier,^{3,4} and choosing to live independently at home.⁵ Responding to these same societal changes has heightened the emphasis Congress⁶ and VHA place upon developing noninstitutional

1118 TELEMEDICINE and e-HEALTH DECEMBER 2008

DOI: 10.1089/jtm.2008.0021

The Early Adopter Experience: Veterans Health Administration (2 of 2)

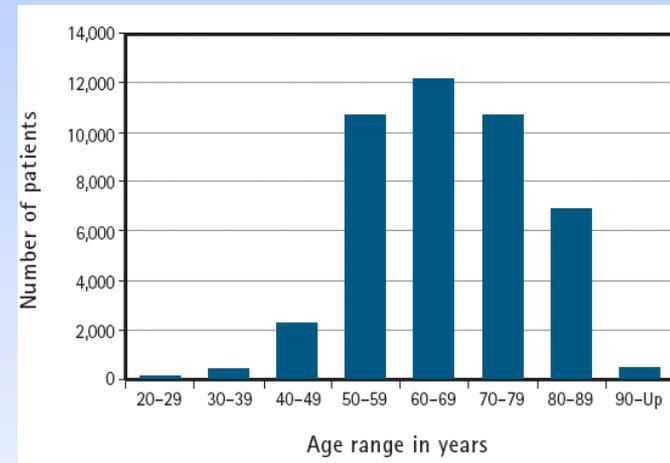
Net cost = \$1,600 / patient / year vs.

- VHA's home-based primary care services = \$13,121 / patient / year
- Market nursing home care rates average = \$77,745 / patient / year

VHA attributes the rapidity and robustness of its CCHT implementation to the “**systems approach**” taken to integrate the elements of the program. This includes:

- Product selection
- Training
- Protocols for patient selection, management
- Data analytics

Age Distribution of all CCHT Patients



Since VHA implemented CCHT in 2003, a total of 43,430 patients have been enrolled

VHA will increase these services 100% above 2007 levels to reach 110,000 patients by 2011. This will be only 50% of its projected NIC needs.

Use of RPM with CHF Patients

RPM interventions have been shown to reduce the frequency of hospitalizations:

- A systematic review of studies involving RPM found that **six of nine studies experienced reductions ranging from 29% to 43% in CHF patients** (Institute for Healthcare Improvement)
- Allegan Homecare **reduced home visits in CHF and COPD patients from an average of 22 nurse home visits per episode to 12 visits for CHF patients**, leading to an increase in average patient case load/nurse from 15 to nearly 25 (Genesis DM / Honeywell HomMed)
- Banner Health reported that telehealth services to more than 550 patients with CHF and other chronic diseases **achieved a readmission rate of 3.8 percent for patients on telehealth, versus a national readmission rate of 29 percent for Medicare-certified home health agencies** (TeleStation/ Philips)



Potential RPM-Associated National Savings In Congestive Heart Failure

The New England Healthcare Institute's Research Update: *Remote Physiological Monitoring* reports the following cost savings for all Class III and Class IV heart failure patients:*

- 60% reduction in readmissions compared to standard care
- 50% reduction in readmissions compared to disease management programs without remote monitoring.
- Potential to prevent 460,000 - 627,000 heart failure-related hospital readmissions/yr
- Annual national cost savings of up to \$6.4 billion dollars



The net savings of RPM technology = \$3,703 / patient / year for those with disease management programs, and \$5,034 for those with standard care

*Note: Assuming 80% of patients hospitalized / year, annual cost \$2,052 / patient for monitoring technology

Web-based Applications for CVD

Specialized web applications that support patient education and self-management interface with peripheral devices to automatically upload data:

- **Heart 360**
 - **Online cardiovascular wellness center** that allows users to manage blood pressure, blood glucose, cholesterol, weight, nutrition and physical activity
 - Provides **education and information** specific to a patient's condition
 - Data can also be **transferred to the patient's HealthVault PHR** for storage or use with other HealthVault-compatible applications
- **CardioSmart Health Tracker**
 - **Online hypertension management tool** that tracks, organizes and presents blood pressure, medication and lifestyle data
 - Supports **patient self-care in the context of lifestyle changes**
 - Provides **care recommendations** that follow ACC guidelines
 - Data are transferable to the **HealthVault PHR**
- **Heart Profilers**
 - Offers **online treatment decision support tools** that help patients with heart disease to make informed decisions
 - Provides decision support specific to a patient's clinical status based on **best practice and latest clinical research**

CVD Technology Example: Connected Cardiac Care (Integrated Remote and Web-based Application)

- Connected Cardiac Care is a **self-management and preventive care program** for CHF patients that combines telemonitoring capabilities with nurse intervention and care coordination, coaching and education
- The program has been launched **throughout the Partners HealthCare network** following a six-month pilot study
- Results include the following:
 - Individuals enrolled in the program had **lower hospital readmission rates and fewer emergency room visits** than those receiving usual care
 - 95 percent of participants found the program improved their heart failure control, helped them manage their condition, and assisted them in staying out of the hospital

