Technologies to Support Patient-Centered Medical Homes

Andrew Broderick

Research Program Director

Center for Innovation and Technology in Public Health

The National Medical Home Summit

San Francisco, California

21 September 2011

Public Health Institute: Technology and Innovation Programs

Center for Innovation and Technology in Public Health


Center for Technology and Aging

- 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

- 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

A Time of Opportunity for Redesigning Care Delivery
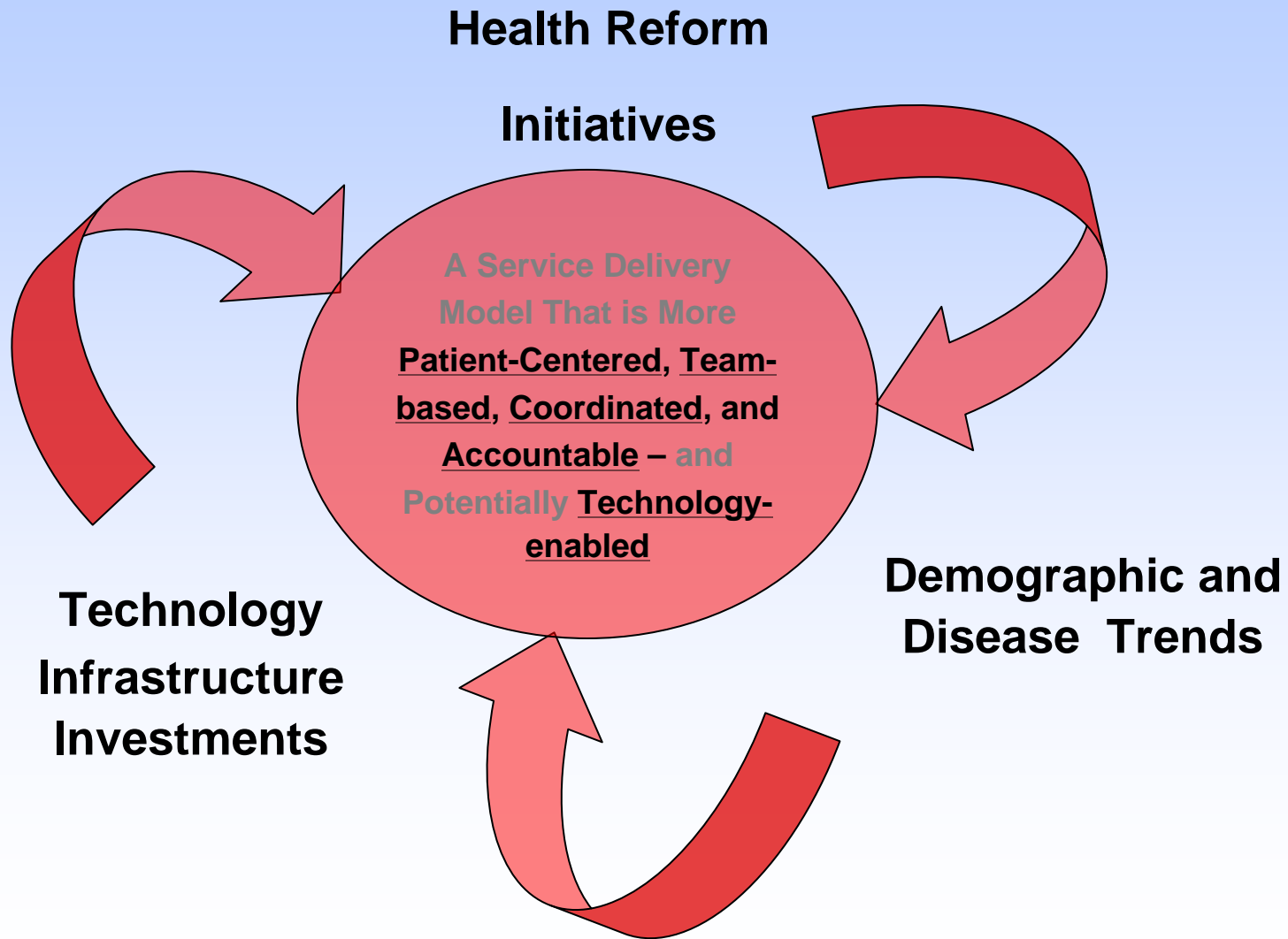
A Framework: Understanding Core Functions of Technology-enabled Care Processes

Evidence on care coordination highlights the following characteristics in successful models:

- Support regular **in-person interactions** with patients with care coordinator

- Manage **care transitions** in comprehensive and timely manner

- Care coordinators who serve as a **"communications hub"** between providers

- Keep case loads (50-80) manageable and provide ongoing **feedback and training**

- Use strong **evidence-based patient education** to support medication adherence

- Provide **resources for addressing psychosocial issues**, such as loneliness and depression

High Performing Health Systems Employ HIT Applications in Improvement Initiatives
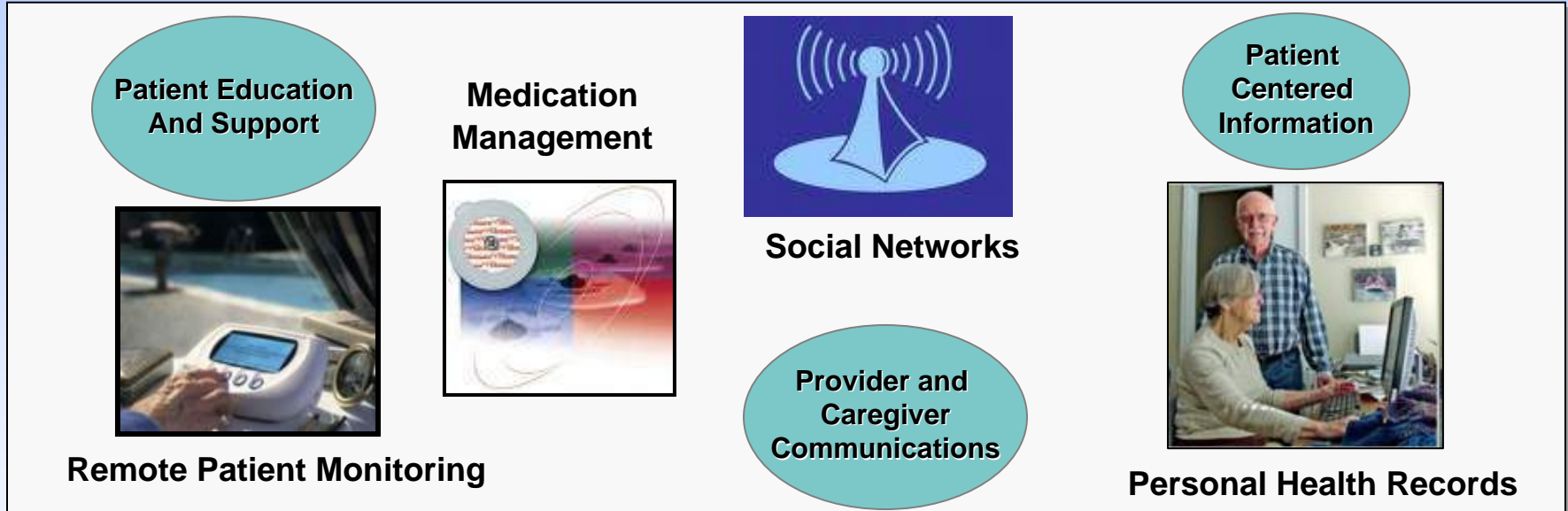
Medical Home Principle	Technological Capability	Required Health IT Functionality	Examples of Health IT Applications
Patient-centered, whole-person orientation	- Uniquely identify patients, including language preferences - Identify the patients' care preferences and preferred learning mode, and facilitate their self-management with input from providers	- Access to patient health records and preferences - Support for patient self-management	- EHRs - PHRs - Telemedicine
Comprehensive, team-based care	- Collect, store, manage, and exchange relevant general medical and behavioral health information	- Collect standardized, accurate, and essential data elements - Facilitate medication reconciliation - Allow registry views for monitoring by patients	- EHRs - PHRs - Patient registries - Telemedicine
Coordinated care		The above, plus: - Support care coordination - Incorporate data from outside systems - Allow linking to other resources	
Continuous access to care	- Communication among practice team and patients	- Allow access via secure Web portal, E-mail, or PHR	- Web portals - Secure E-mail - PHRs - Telemedicine
Systems-based approach to quality and safety	- Collect, store, measure, and report on the processes and outcomes of individual and population performance and quality of care - Uniquely identify patients in the practice - Support providers' decisionmaking on tests and treatments	- Allow automated quality measurement - Allow improved interfaces with public health services - Allow outcomes evaluation - Allow evidence-based CDS at the point of care - Allow risk stratification of patients for performance measurement	- EHRs - Patient and population registries - Pay-for-performance outcomes databases - Telemedicine - PHRs with decision support tools

Source: Mathematica's adaptation from the Patient-Centered Primary Care Collaborative, 2009, pp. 7-14.
Key: CDS = clinical decision support; EHR = electronic health record; PHR = personal health record.

HIT applications provide functional capabilities that are in strong alignment with the goals of the patient-centered medical home

The Potential of Patient-Centered Technologies

Patient Education And Support

Medication Management

Social Networks

Patient Centered Information

Remote Patient Monitoring

Provider and Caregiver Communications
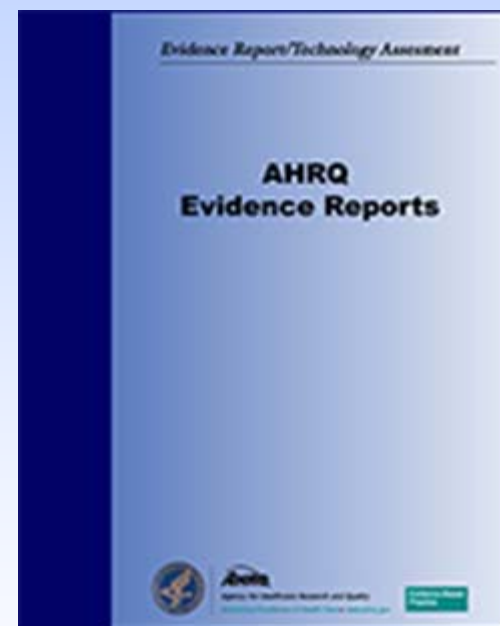
Personal Health Records

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

Source: Barriers and Drivers of Health Information Technology Use for the Elderly, Chronically Ill, and Underserved, November 2008. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/clinic/tp/hitbartp.htm

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 patient behavior change

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

9

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 Support for Chronic Care Management

In the drive to reduce costs, improve quality and satisfaction, and increase the productivity of primary care health workers, early adopters identify six components of chronic care management facilitated by remote patient monitoring*

- **Early intervention:** to detect deterioration and intervene before unscheduled and preventable services are needed
- **Integration of care:** exchange of data and communication across multiple co-morbidities, multiple providers, and complex disease states
- **Coaching:** motivational interviewing and other techniques to encourage patient behavioral change and self-care
- **Increased trust:** patients' satisfaction and feelings of "connectedness" with providers
- **Workforce changes:** shifts to lower-cost and more plentiful health care workers, including medical assistants, community health workers, and social workers
- **Increased productivity:** decreased home visit travel time and automated documentation

Coye, M.J., Haselkorn, A., & DeMello, S. (2009). Remote Patient Management: Technology-Enabled Innovation and Evolving Business Models for Chronic Disease Care. Health Affairs, 28(1), 126-135

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: Conditions for Success

Key conditions for successful RPM deployment and statistically significant clinical results reflect a mix of technology, human, and organizational management factors

Category	Condition
Patient	• No moderate or severe cognitive, visual, or physical impairment • Life expectancy is not measured in months rather than years • At-risk for deterioration and hospitalization but motivated patients
Device	• User-friendly and non-intrusive nature • Effective matching with individual patient's needs and capabilities • Automation simplifies data capture and offers greater reliability • Promote patient access to information to actively engage
Organization	• Adapt the means and frequency of monitoring to each patient's needs • Design and implementation that supplements primary care practices • Close collaboration between staff and other clinical professionals

Source: Clinical Effects of Home Telemonitoring in the Context of Diabetes, Asthma, Heart Failure and Hypertension: A Systematic Review (2010)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2956232/

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 U.S. 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

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 standardizing and integrating the core program elements:

- Product selection
- Training and development
- Protocols - patient selection and management
- Data analytics

VHA Outcomes 2004-2007

| Condition	Patients	Decrease Utilization
Diabetes	8,954	20.4
Hypertension	7,447	30.3
CHF	4,089	25.9
COPD	1,963	20.7
PTSD	129	45.1
Depression	337	56.4
Other Mental Health	653	40.9
Single Condition	10,885	24.8
Multiple Conditions	6,140	26.0

Partners HealthCare: Connected Cardiac Care

- 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

PARTNERS® HEALTHCARE | CENTER FOR CONNECTED HEALTH

Remote Patient Monitoring: CTA Lessons Learned

- **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

Center for Technology and Aging
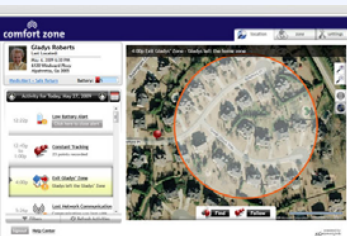
Remote Patient Monitoring:
Potential Levers to Realize Greater Value

- Incentive-based Coverage and Payment Policies
- ROI Frameworks
- Implementation Toolkits and Best Practices
- Business Models
- Open Innovation
- Professional Licensure and Scope of Practice
- Consumer Acceptance and Preparedness

Personal Health Records: Patient Engagement Tool

Patient portals and secure messaging capabilities can increase connectedness, continuity of care, and self-management to support efficient care outcomes
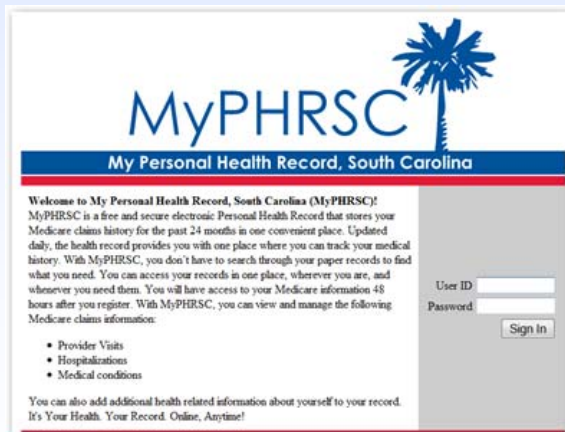
- Improved outcomes for patients

- Improved provider efficiency

- Consumer Empowerment

# Washington State Unit on Aging: Shared Care Plan Personal Health Record

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
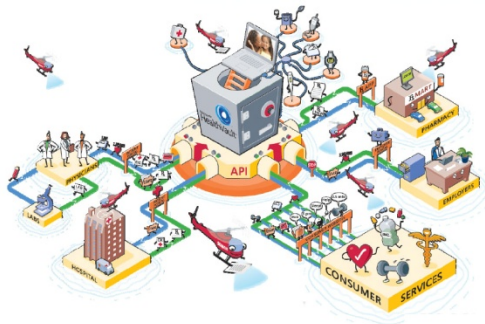
Personal Health Records: Medication Reconciliation

One-time Entry Medication Lists

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

mHealth:
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

Patient-Centered Diabetes Care: Care4Life

Intervention: A Spanish-language text messaging intervention

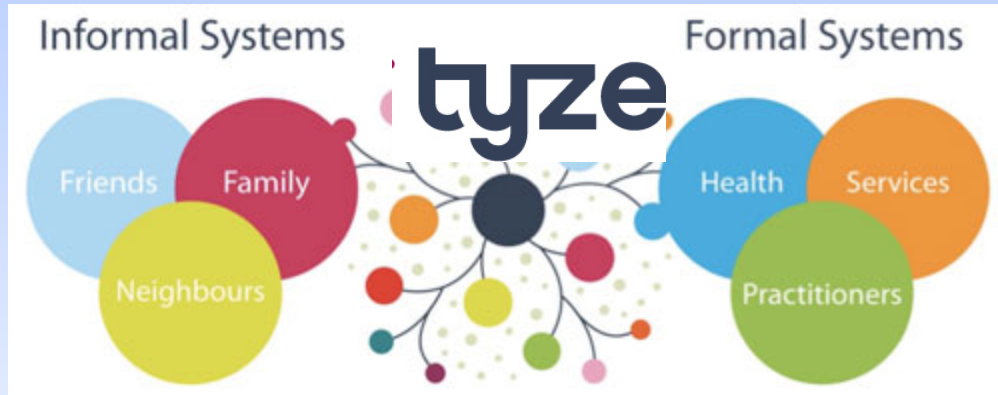**Population:** Hispanic adults, newly diagnosed with type 2 diabetes

Objective: Support patient self-management through facilitating patient education, behavior change, and adherence with standard care practices.

Targeted Outcome: a practical, low-cost, replicable mHealth application that can be rapidly introduced into safety net communities.

Online Social Networks: Connect, Share, Coordinate, Support

Informal Systems · Formal Systems

tyze

Friends · Family · Neighbours · Health · Services · Practitioners

The Kinnexxus Senior Ecosystem™

Community

Senior

Friends & Family

Professional Care Providers

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.