



Case Studies in Telehealth Adoption

January 2013

Scaling Telehealth Programs: Lessons from Early Adopters

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The mission of The Commonwealth Fund is to promote a high performance health care system. The Fund carries out this mandate by supporting independent research on health care issues and making grants to improve health care practice and policy. Support for this research was provided by The Commonwealth Fund. The views presented here are those of the authors and not necessarily those of The Commonwealth Fund or its directors, officers, or staff.

ABSTRACT: Remote patient monitoring (RPM)—like home telehealth and telemonitoring—can help improve coordination, improve patients’ experience of care, and reduce hospital admissions and costs. Such technologies remotely collect, track, and transmit health data from a patient’s home to a health care provider and can facilitate communication and help engage patients in the management of their own care. This synthesis brief offers findings from case studies of three early RPM adopters: the Veterans Health Administration, Partners HealthCare, and Centura Health at Home. Each of the programs started as a pilot with the support of a small group of advocates who believed in the technology’s potential for offering improved care for a targeted population. Early lessons include promoting a culture of openness and preparedness; using a multidisciplinary team-based approach; establishing leadership support; minimizing barriers to patient enrollment, like cost; and including nonstandard measures, like patient experience and staff satisfaction, in program evaluations.



OVERVIEW

A lack of systematic care coordination contributes to a high prevalence of preventable rehospitalizations in the Medicare population. As the U.S. health care system looks to achieve the goals of the Institute for Healthcare Improvement’s Triple Aim—improving patients’ experience of care, improving the health of populations, and reducing the cost of health care—providers increasingly acknowledge that patient-centered technologies can contribute toward the realization of those goals. However, providers for the most part have little experience with such technologies.

Health care reforms provide an opportunity to replace current fragmented and poorly coordinated care delivery practices with a more integrated model of care, supported by the use of technology-enabled innovations. While their implementation into care practices can be disruptive to workflow and result in process

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Commonwealth Fund pub. 1654
Vol. 1

changes in the basic delivery of care, experience indicates that their diffusion can lead to significant improvements in the quality and cost of care and transform the performance of care delivery on key outcome measures such as preventable readmissions.

Using Remote Patient Monitoring to Improve Patients' Outcomes and Experiences

This brief offers a synthesis of findings from case studies of three early adopter organizations that use remote patient monitoring (RPM). RPM—also referred to as home telehealth, telehomecare, and telemonitoring—can help resolve critical challenges in care coordination. RPM technologies can remotely collect, track, and transmit patient health data from a patient's home (or other care setting) to a health care provider or case manager in a different location. RPM can facilitate interaction and communication between the patient and caregiver and can help to activate and engage patients in the management of their own care.

Specific outcomes of RPM include reducing hospitalizations and health care costs; improving patient knowledge, satisfaction, and clinical outcomes; and activating patients to better manage their own health and care. However, despite the potential broad-based benefits, their use is still in the early stages of adoption for most providers.

The three organizations studied in this series—the Veterans Health Administration (VHA), Partners HealthCare, and Centura Health at Home—have successfully implemented telehealth programs for target populations within their systems. The telehealth-enabled interventions deployed by these organizations rely at their core on the use of remote monitoring devices in the homes of patients to capture and transmit biometric data and communicate health status to a remote care team who continuously review the data and coordinate care accordingly. These programs can help realize improved financial and clinical outcomes by facilitating behavior change and by staging timely, interactive care interventions to prevent unnecessary hospital admissions or emergency department visits.

Each of the programs described in this series of case studies started as a pilot with the support and promotion of a small group of advocates who believed in the technology's potential and capacity for offering improved care for a targeted population. Evidence of each program's positive impact reinforced that belief and strengthened the case for expansion throughout the organizations. While each organization's approach to the design and implementation has varied, their collective experience offers other organizations best practices for implementing telehealth-enabled care programs at scale.

Early Lessons from Telehealth Adopters

The experiences of the three organizations offer considerations for organizations planning to design, implement, and scale telehealth programs for target populations within their health systems:

- **Telehealth-enabled programs disrupt the status quo.** Telehealth requires a different mind-set to achieve desired changes in practice and targeted outcomes. An organization's ability to promote a culture of openness, preparedness, and adaptiveness to technology-led change will increase the likelihood that the implementation will succeed.
- **Program development involves a multidisciplinary, team-based approach.** Telehealth requires the integration of technical, clinical, and business processes into a standard program. Telehealth programs tend to specialize in providing the technology expertise, wraparound support and training, and equipment installation, while home care and other care partners provide the clinical expertise for successfully designing and implementing the technology for use in care.
- **Technology implementation is a social process.** Technology-enabled solutions in health care are very much social in nature. Establishing leadership support and identifying program champions are the core foundations for a successful program, while patient activation and engagement have been key to successful program outcomes.

- **Barriers to patient participation need to be low.** To minimize any potential barriers to maximizing enrollment, patient participation should be at no or little financial cost and enrollment should be automatic for all eligible patients. The VHA has recently announced that it will waive copayments for patients receiving its telehealth services.
- **Telehealth data can empower all stakeholders.** Telehealth data can have a positive impact on patient care when placed in the hands of motivated clinicians and patients. The real-time transmission of monitoring data, for example, allows nurses to provide patients with just-in-time care and education. The use of personal health data can help educate and motivate patients to make necessary lifestyle changes and realize better clinical outcomes.
- **Program evaluations need to incorporate non-standard measures.** Program evaluations need to recognize the importance of nonstandard measures and the role they contribute to improved clinical and financial outcomes. These may include patient experience and staff satisfaction, for instance.
- **Successful programs can take time to scale successfully.** It takes time to integrate technology into care delivery and to allow staff to adapt. Structure, coordination, planning, and setting goals and expectations are critical. Aligning program goals with broader organizational strategic initiatives to improve performance and deliver more accountable care can facilitate progress.

LEARNING FROM THE VETERANS HEALTH ADMINISTRATION, PARTNERS HEALTHCARE, AND CENTURA HEALTH AT HOME

Each organization has established practices for scaling telehealth based on its needs and objectives. The strategic objectives used by these organizations to guide the introduction of telehealth programs into practice are often in alignment with larger strategic initiatives. These may include performance improvement initiatives that seek to achieve clinical excellence

and improvement in care quality and reduced cost or responses to health care and payment reforms.

Each program has sought to enhance patient activation and engagement in care, as well as the remote monitoring of data for the early detection of complications. These shared program features are fundamental to facilitating behavior change and ensuring timely, interactive care interventions that prevent unnecessary hospitalizations. In all organizations, organizational culture, human factors, and social processes that promote support from executive leadership, clinical staff, and patients and their families have been key elements to ensure the realization of successful program outcomes.

Veterans Health Administration: Taking Home Telehealth to Scale Nationally

The [Veterans Health Administration](#) (VHA) is the most notable example of a home telehealth service taken to scale. The VHA piloted, evaluated, and deployed home telehealth in a continuing process of learning and improvement, and found that an enterprise-wide implementation can be achieved and can lead to cost-effective, quality outcomes for chronic care patients. The organization's Care Coordination/Home Telehealth (CCHT) program uses Group Health's Chronic Care Model as a framework, with the patient's home the preferred site of care wherever possible and appropriate. Promoting patient activation and self-management has been key to CCHT's success in preventing unnecessary hospital admissions or emergency department visits.

First introduced in 2003, CCHT is now a routine service that uses home telehealth and disease management technologies in the remote care management of chronically ill patients at risk for long-term institutional care. CCHT has demonstrated successful outcomes including patient satisfaction and reductions in bed days of care and hospital admissions. Through the end of fiscal year 2010, veterans reported patient satisfaction levels greater than 85 percent for home telehealth services offered through CCHT, and reductions in bed days of care in excess of 40 percent on preenrollment figures for the CCHT population

receiving home telehealth. The reduction in health care resource utilization (defined as hospital days of stay) from 2004 to 2007 is significant across eight primary conditions for patients monitored for either single or multiple diagnoses (Exhibit 1).

The VHA's national telehealth program has been developed through strong leadership support, articulation of a strategic vision and compelling business case, and an underlying health information technology infrastructure. Coupled with a strong commitment to standardized work processes, policies, and training, the program has transformed care coordination to successfully meet the chronic care needs of an aging veteran population while reducing their utilization of and costs associated with institutional care. Other integrated delivery networks or government-sponsored systems can benefit most from VHA's lessons learned. From the perspective of patient care coordination, the lessons may be most applicable to the Medicare–Medicaid dual-eligible population.

The VHA attributes the rapidity and robustness of its CCHT implementation to the systems approach taken to integrate the clinical, technology, and business elements of the program based on experience gained from piloting. For example, CCHT incorporated existing business processes wherever possible to reduce the program's overhead costs and increase efficiency

on an enterprise scale. With more than 70,000 patients receiving telehealth-supported care management in 2012, the VHA's experience demonstrates that implementation at scale is possible and can yield substantial returns. Some of the VHA's keys to success include:

- **Aligning telehealth strategy with organizational vision and mission.** The VHA's success with telehealth is evidence of the organization's ability to connect vision, strategy, and technology in the delivery of continuous, coordinated chronic care for targeted populations at risk for long-term institutional care. The experience serves as a strategic and operational blueprint for other organizations looking to implement telehealth at scale.
- **Leveraging underlying human and social processes.** The VHA has instilled an organizational culture and capacity for technology-led change. This has resulted in the telehealth program being embraced by the national and local leadership, as well as by the population it is designed to serve. The staff that originally started the program has since advanced to more senior positions throughout the organization, effectively becoming champions for the program.
- **Generating systematic evidence of targeted outcomes.** Targeted outcomes have been maintained

Exhibit 1. VHA Care Coordination/Home Telehealth Program Outcomes, 2004–07

Condition	Number of patients	Percent decrease in utilization
Diabetes	8,954	20.4%
Hypertension	7,447	30.3
Congestive heart failure	4,089	25.9
Chronic obstructive pulmonary disease	1,963	20.7
Post-traumatic stress disorder	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

Source: A. Darkins, P. Ryan, R. Kobb et al., "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," *Telemedicine and e-Health*, Dec. 2008 14(10):1118–26.

as the program has been taken to scale. As the program has grown, the evidence has reinforced the benefits to patients and has made a strong clinical and business case that facilitates buy-in from clinicians and managers. The dissemination of findings broadly throughout the system has reinforced the continuous cycle of learning within the organization.

- **Standardizing core program elements.** With systemized clinical, technology, and business processes, as well as national policies and operational procedures for contracting with vendors and a dedicated program office and training center, CCHT care is consistent across time and place throughout the VHA system.
- **Balancing system with local needs.** Successful implementation of the program has relied on the VHA's ability to balance top-down guidance on standardizing approaches to clinical protocols, workforce training, and business processes with bottom-up innovation to meet the needs of patients at the local level.
- **Investing in an enabling technology infrastructure.** The enterprise-wide health information technology infrastructure and use of algorithms to match patients with appropriate telehealth technology have contributed to the consistency in the systemwide implementation of home telehealth. Although beneficial to the program, they are not necessarily required for a program to work successfully.
- **Dedicating resources to staff training and development.** Establishing a national training center to deliver online training programs has ensured a telehealth-competent workforce to deliver efficient and effective care at scale. Program staff and graduates of the training program have been critical in helping solve programmatic issues at the local level and in serving as ambassadors for promoting the program throughout the organization.

Partners HealthCare: Connecting Heart Failure Patients Through RPM

Partners HealthCare is an integrated health system in Boston. Partners' programs in home telehealth have been driven in large part by the Center for Connected Health (CCH), Partners' research center for the development, testing, and implementation of patient-centered technology solutions for health care delivery. Being one of only a handful of research centers of its type in the world, CCH plays a unique role in the integrated delivery system's development of technology-enabled approaches to delivering quality, cost-effective, patient-centered care. The Connected Cardiac Care Program (CCCP), which provides home telemonitoring and education for heart failure patients, is among a number of CCH programs that have been successfully piloted at Partners and scaled across the network.

A 2006 pilot study of CCCP with 150 heart failure patients showed reductions in heart failure-related and all-cause readmissions as well as in emergency room visits. While these results were not statistically significant, they provided evidence to Partners' leadership that led to its support for the expansion of CCCP. Additional benefits included a reduction in the need for nurse visits for patients receiving skilled nursing care from a home care provider, and participants' high satisfaction levels and greater confidence to self-manage diseases. To date, more than 1,200 patients have been enrolled in CCCP. The program has consistently experienced an approximate 50 percent reduction in heart failure-related readmission rates for enrolled patients. Non-heart failure readmissions have declined by 44 percent. CCH's in-house analysis estimates that the program has generated total cost savings of more than \$10 million since 2006 for the more than 1,200 enrolled patients (Exhibit 2).

In Partners' experience, the role of human factors and social processes in supporting technology deployment has been as important as the technology itself in ensuring the successful introduction of connected health solutions into workflow and patient care. The impact that the technology has on patient

Exhibit 2. Partners HealthCare's Connected Cardiac Care Program and Reducing Preventable Readmissions

CCCP outcomes

- 51% reduction in heart failure hospital readmissions*
- 44% reduction in non-heart failure hospital readmissions*
- Improved patient understanding of heart failure and self-management skills
- High levels of clinician and patient acceptability and satisfaction

Savings**

A case study prepared by CCH reports the following cost savings to date from CCCP:

- Cost of CCCP: \$1,500 per patient
- Total savings from reduction in hospitalizations: \$9,655 per patient
- Total net savings: \$8,155 per patient
- Total savings: \$10,316,075 for 1,265 monitored patients since 2006

* N=332

** This program targeted reductions in unplanned heart failure and non-heart failure related admissions. The savings achieved factor in the cost of running the program, including marketing, referral management, telemonitoring nurse support, and technology.
Source: CCH analysis provided to the author.

activation and engagement in self-care and the subsequent role it plays in demonstrating evidence to providers has been key to Partners' success. These outcomes are critical evidence in demonstrating to providers that such programs can support behavior changes that lead to improved health and quality of care.

Strategic initiatives aligning the Partners organization with external forces that are shaping the future of health care organization, financing, and delivery have served as important levers for more widespread use of connected health solutions in patient care.

Factors that have been critical to Partners' success in implementing CCCP at scale include: the importance of leadership support for and the championing of the telehealth program, the integration of patient data into workflow to enable providers to more effectively assess patient status and provide just-in-time care and education, and the use of personal health data to help educate and motivate patients to make necessary lifestyle changes and realize better clinical outcomes. Additional success factors include:

- **Enrolling patients on an opt-out basis.** The initial enrollment approach required that clinicians refer patients to the program. This resulted in low levels of clinician engagement. Through the opt-out

process, patients who have been identified as eligible for participation are automatically enrolled and clinicians are now responsible for notifying CCCP if a patient wishes to not be enrolled. This has resulted in an increase in the number of enrollees in CCCP. Satisfaction levels among doctors have increased as benefits in patient care have become evident.

- **Activating and engaging patients in self-care through technology.** Technology has a positive impact on patient engagement and motivation once it is placed in patients' hands. The evidence that the program can and does support behavior changes that lead to improved care and quality outcomes has contributed to the program's overall success. Through technology, patients have felt more connected to their care team.
- **Using data to motivate and empower clinicians and patients.** Teaching patients self-management skills can help drive a reduction in readmissions. Participants receive constant feedback about how lifestyle factors affect health outcomes, as well as just-in-time care in which remote monitoring and intervention by nurses sends strong messages to patients that they are accountable.

Centura Health at Home: Making Home Telehealth the Standard of Care

Centura Health at Home (CHAH) is a division of Centura Health, the largest integrated health care system in Colorado. CHAH expands the reach and impact of telehealth-enabled home health care services through the integration of two independent, successful home health services: a clinical call center and remote monitoring telehealth program. The integrated program combines RPM efforts that started in 2004 with a clinical call center–based program that has been in existence for more than 20 years. The merged clinical call center–telehealth program extends the reach of telehealth to include all patients in the target populations who are preparing for hospital discharge. The merged program also broadens the clinical call center’s capabilities to include telehealth assistance and coordination of care for patients by using remote patient monitoring on a 24/7 basis, while adapting the clinical call center’s traditional business marketing model to a clinical business model to support a more robust telehealth program. The new program expands service coverage to patients not previously meeting the Medicare homebound benefit by offering a telephonic telehealth-only treatment group.

A one-year pilot of the integrated program in 2010–2011 demonstrated successful outcomes in terms of reducing 30-day hospital readmissions and home nursing visits, while improving quality of life and patient self-management and education. The specific goal of the pilot was to decrease the 30-day readmission rates across the Centura system by an additional 2 percent for patients with congestive heart failure, chronic obstructive pulmonary disease, and/or diabetes, as well as measurably increase participants’ quality of life. Over the course of the year-long pilot, 30-day readmission rates across the three targeted conditions were reduced by 62 percent. Emergency department use decreased from 283 visits in the prior year to 21 visits after one year, and the frequency of home visits was reduced to an average of three visits over a 60-day period from an average of two or three visits per week prior to the implementation of the intervention (Exhibit 3). This led to improved efficiency, extending the capacity

and case loads of nursing staff, and cost savings of between \$1,000 and \$1,500 of total costs per patient.

Centura’s experience indicates that restructuring home service coordination and educating clinical call center nurses on chronic disease management are key elements to the program’s success. The scaling of the program led to a decision to switch telehealth vendors to more cost-effectively support the program while meeting the broader patient population’s needs. The program’s success has led to telehealth becoming the standard of care at CHAH. The results of the program supported the sustainability of the intervention and led to plans to expand the telehealth program within CHAH and to senior living communities with the goal of reaching 1,000 patients by 2012 and 2,000 patients by 2013.

Centura’s experience indicates that the use of RPM combined with a 24/7 telehealth clinical call center benefited older adults’ health while making more effective use of existing health care resources and extending the reach of nursing staff. Key elements of the program’s success included: restructuring discharge planning to introduce patients to the telehealth program while still in the hospital, having clinicians introduce the program to patients to increase the likelihood of their enrollment, educating call center nurses on the clinical management of chronic diseases, and providing real-time education to patients to improve their self-management capabilities. Additional success factors for bringing the program to scale include:

- **Engaging staff through evidence-based outreach and promotion.** Programs need to communicate to home care nurses and clinicians the value of telehealth for patients, nurses, and physicians to reduce the likelihood of resistance and ensure high levels of staff engagement. Forums may include an open house for clinicians to interact with the technology and ask questions. Key discussion points focus on outcomes, patient-to-staff ratios, and rehospitalization rates, as well as patient satisfaction data.
- **Restructuring discharge planning and home service coordination.** The discharge planning process and home service coordination were

Exhibit 3. The Impact of Integrated Telehealth on 30-Day Readmission Rates at Centura Health at Home

Facility and condition:	Pre-project readmission rates	Post-intervention readmission rates achieved*
<i>St. Anthony's Central</i>		
• Congestive heart failure	13.8%	4.2%
• Chronic obstructive pulmonary disease	14.1%	6.7%
• Diabetes	14.7%	0.0%
<i>Porter Adventist Hospital</i>		
• Congestive heart failure	17.7%	9.5%
• Chronic obstructive pulmonary disease	12.5%	2.7%
• Diabetes	9.5%	0.0%

* About one-quarter of the 200 patients used telephonic telehealth, while the majority used remote patient monitoring and had access to the clinical call center. Source: Data provided by Centura Health at Home, reporting outcomes to the Center for Technology and Aging.

restructured in the hospital to incorporate telehealth-based care. Case managers have been trained to identify patient eligibility and enrollment criteria for patients being discharged without home care. Introduction to the telehealth intervention takes place before discharge. Within 48 hours of patient discharge, a personalized telehealth algorithm is created for RPM patients, and telehealth technicians install and train patients to use the device within their homes.

- **Introducing patients to the program through a trusted clinician.** Introducing the program during the hospital stay by a home care nurse or physician or by a primary care physician during a scheduled office visit after discharge increased the likelihood that a patient would enroll in the telehealth program.
- **Providing staff training on effective communication techniques.** Home service coordination nurses who introduced patients to the program

during their hospital stay required additional training for effective communication techniques to emphasize the value of the program to patients. Clinical call center nurses also benefited from effective communication training as well as disease management education to bolster confidence in clinical decision-making processes to actively manage patients in response to issues raised during calls.

- **Selecting technology that scales with the program and its needs.** As a result of increasing the volume of patients served through the integrated telehealth program, CHAH made a decision to change vendors to support more cost-effective scaling of the program while meeting the broader patient population's needs. The new platform offers the ability to monitor only those patients who fall outside established parameters, thereby placing the emphasis on those patients needing immediate attention.

The organizations profiled in our *Case Studies in Telehealth Adoption* series include the [Veterans Health Administration's](#) Care Coordination/Home Telehealth program, [Partners HealthCare's](#) Connected Cardiac Care Program, and [Centura Health's](#) Centura Health at Home program. To read the profiles, visit our website at <http://www.commonwealthfund.org/Publications/Case-Studies/2013/Jan/Telehealth-Synthesis.aspx>.

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Editorial support was provided by Deborah Lorber.



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