



Case Studies in Telehealth Adoption

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The Veterans Health Administration: Taking Home Telehealth Services to Scale Nationally

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ABSTRACT: Since the 1990s, the Veterans Health Administration (VHA) has used information and communications technologies to provide high-quality, coordinated, and comprehensive primary and specialist care services to its veteran population. Within the VHA, the Office of Telehealth Services offers veterans a program called Care Coordination/Home Telehealth (CCHT) to provide routine noninstitutional care and targeted care management and case management services to veterans with diabetes, congestive heart failure, hypertension, post-traumatic stress disorder, and other conditions. The program uses remote monitoring devices in veterans' homes to communicate health status and to capture and transmit biometric data that are monitored remotely by care coordinators. CCHT has shown promising results: fewer bed days of care, reduced hospital admissions, and high rates of patient satisfaction. This issue brief highlights factors critical to the VHA's success—like the organization's leadership, culture, and existing information technology infrastructure—as well as opportunities and challenges.



OVERVIEW

Since the 1990s, information and communications technologies—including telehealth—have been at the core of the Veterans Health Administration's (VHA's) successful system-level transformation toward providing continuous, coordinated, and comprehensive primary and specialist care services. The VHA's leadership and culture; underlying health information technology infrastructure; and strong commitment to standardized work processes, policies, and training have all contributed to the home telehealth program's success in meeting the chronic care needs of a population of aging veterans and reducing their use of institutional care and its associated costs. The home telehealth model also encourages patient activation, self-management, and helps in the early detection of complications.

Within the VHA, the Office of Telehealth Services (OTS) uses health informatics, disease management, and telehealth technologies to support the remote provision of services and improve access to timely care for patients in their homes and local communities (Exhibit 1). The OTS offers veterans a program called Care Coordination/Home Telehealth (CCHT) to provide routine noninstitutional care and targeted care management and case management services to veterans with diabetes, congestive heart failure, hypertension, post-traumatic stress disorder (PTSD), chronic obstructive pulmonary disease, and depression. CCHT uses remote monitoring devices in veterans' homes to communicate health status and to capture and transmit biometric data that are monitored remotely by care coordinators.

In fiscal year 2010, an estimated 300,000 patients received care across all programs within OTS. CCHT, which targets patients at risk for long-term institutional care (approximately two-thirds of the current CCHT population), currently manages more than 70,000 veteran patients using home telehealth technologies. The program has demonstrated successful outcomes. Through the end of fiscal year 2010, veterans reported patient satisfaction levels greater than 85 percent for home telehealth services offered through CCHT. In addition, the program was associated with a greater than 40 percent reduction in bed days of care, as compared with pre-enrollment figures, for the CCHT population receiving home telehealth.¹

Organizations outside the VHA can learn from its home telehealth experience. Core principles in successful implementation include: a recognized responsibility for the care and case management of patients across the continuum; a systematic approach to the introduction of a quality performance improvement and management infrastructure; contracting with technology vendors on a national scale; and implementation that is driven at the local clinical level to ensure that benefits can be derived immediately. This is supported by a tremendous organizational readiness and capacity for change that is embodied in all areas of practice. The ability to directly control budgets for care services is also a strong motivator in making home telehealth programs work. While complementary infrastructure elements at the VHA, including electronic health records (EHRs), help make home telehealth operational at an organizational level, they are not necessarily required for a program to work.

From an organizational perspective, it may be easiest for other integrated delivery networks or government-sponsored systems to draw lessons from the VHA's experience, particularly where there is a recognized responsibility for the care and case management of patients across the continuum. In terms of care management and patient care coordination needs, the lessons of the VHA may be most applicable to the dual-eligible population.

Exhibit 1. Elements of Telehealth, Veterans Health Administration

Telehealth involves the use of information and communications technologies to deliver medical care remotely by connecting multiple users in separate locations. The VHA Office of Telehealth Services uses health informatics, disease management, and telehealth technologies to facilitate access to care and improve health outcomes in three main ways:

- **clinical video telehealth** uses interactive video technologies for the real-time delivery of physician visits to distant clinics to make diagnoses, manage care, perform check-ups, and provide care in polytrauma, mental health, rehabilitation, and surgical consultations;
- **store-and-forward telehealth** supports the acquisition, transmission and storage of prerecorded information (sound, data, image), such as X-rays, video clips, and photos, between providers and specialists in radiology, dermatology, and retinopathy; and
- **care coordination/home telehealth** uses electronic monitoring devices to capture patient physiological data related to symptoms and vital signs in the home environment and transmit those data to health care providers for review and appropriate coordination of care.

Source: U.S. Department of Veterans Affairs, VHA Office of Telehealth Services, "What Is Telehealth?" (Washington, D.C.: U.S. Department of Veterans Affairs, 2011).

BACKGROUND

The Veterans Health Administration within the U.S. Department of Veterans Affairs (VA) is regarded as a modern, responsive, efficient, and effective health care organization that many hold up as a model for delivering cost-effective, quality outcomes. While it faces similar financial and clinical challenges as other health care delivery organizations, the VHA is unique in terms of the health care needs it addresses among the veteran population and in being directly accountable to Congress and financed primarily from public budgets. As one of the nation’s largest integrated health care systems, the VHA’s primary and specialty care services serve approximately 6 million veterans with an annual budget of more than \$50 billion. It is organized around a service network model rather than hospitals. Each of the 21 Veterans Integrated Service Networks (VISNs)—or shared systems of care—operates with accountable clinical leadership responsible for making basic budgetary, planning, and operating decisions (Exhibit 2).

The shift toward continuous, coordinated, and comprehensive primary and specialist care services started in the mid-1990s.² Observers have attributed the VHA’s successful transformation from a bottom- to

a top-performing health care organization to a combination of factors, including a strategic vision and compelling case for system-level transformation; leadership support and shared decision-making authority between officials in the central office and regional managers and key personnel at the local level; continuous and accountable performance improvement processes targeted toward incentivizing the delivery of interdisciplinary, team-based, patient-centered, quality care services at a reasonable cost; and a technology architecture that has served as the backbone for implementing enterprise-wide EHRs and health information systems and allowing the organization to align its mission with quantifiable strategic goals and performance indicators. The potential value to the VA from investments in health information technology is just over \$3 billion in cumulative benefits (net of investment costs) through reductions in unnecessary and redundant care, process efficiencies, and improvements in care quality.³

Reducing hospital readmissions has been an important performance improvement goal at the VHA. Higher readmission rates within the VHA have been generally associated with patients who are at an increased distance from the admitting facility and experience higher comorbidity scores.⁴ In fiscal year 2009, the VHA reported that the 30-day unadjusted all-cause readmission rate averaged 12.7 percent (with a range of 0 to 17.7%) across the VHA health care system. During this period there were 485,774 acute medical/surgical discharges and 81,634 mental health hospital discharges reported by the VHA. The unadjusted readmission rate for congestive heart failure was higher than the VHA national average (20.2%) at 12 facilities and significantly lower than the VHA national average at 10 facilities.⁵ Structural and organizational interventions using technology, like telehealth, are particularly promising in terms of offering improved access to health care and providing superior quality of care.

Care Coordination/Home Telehealth was developed by the VHA to respond to the rising number of elderly veterans with chronic care needs and reduce their use of institutional care and its associated high costs. Group Health’s Chronic Care Model serves as the conceptual framework for CCHT and has helped

Exhibit 2. Veterans Administration: Demographics and Health Care Utilization

Population	
Projected U.S. veterans population	22,328,000
Sex	
Female	10%
Age	
65 years or older	42.1%
Race	
White	83.0%
Black	11.9%
Hispanic	6.1%
Veterans Health Affairs	
Total enrollees	8.57 million
Total unique patients treated	6.17 million
2011 appropriations (actual)	\$51.5 billion
Hospitals	152
Community-based outpatient clinics	817

Source: National Center for Veterans Analysis and Statistics.

move toward the goal of making the patient's home into the preferred place of care where possible and appropriate.⁶ Promoting patient activation and self-management is fundamental in the CCHT model to prevent unnecessary hospital admissions or emergency department visits. The VHA's experience indicates that the messaging functionality within home telehealth services supports this goal through proactively identifying adverse symptoms, knowledge deficits, and negative health-related behaviors. Reduced use of health care resources for CCHT's patient population is attributed to patient self-management, disease management, and the use of virtual visits.

HOME TELEHEALTH: TAKING A PROGRAM FROM INITIAL PILOT TO SCALE

Today, the VHA is the largest individual purchaser of home telehealth technology worldwide and it plans to increase the size of its program considerably. The VHA's history has made it the health care industry's test case for how to successfully plan and implement a program that has been embraced throughout the organization from senior leadership to the patient population. However, the VHA has faced many of the same challenges as other health care organizations in implementing technology into care delivery practice. Namely, scaling a process that reproduces the financial and care outcomes from pilots while ensuring sustainability of the clinical, technology, and business processes necessary to support home telehealth.

Implementation at the VHA has centered around reengineering existing processes, a strong IT infrastructure, and a commitment to training. 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 its experience with pilot programs. For example, CCHT incorporated existing business processes wherever possible to reduce the program's overhead costs and increase efficiency. The VHA experience demonstrates that implementation at scale is possible and can yield substantial returns across both time and geography. Dr. Adam Darkins,

who oversees CCHT, adds that the basic care needs, staffing, and use of technology to coordinate care, as well as design and operational details will vary to accommodate differences in health care delivery organizational models.

The current program's origins date back to the mid-1990s, although the VHA's involvement with telemedicine dates back to 1977 when it piloted the use of telemedicine in Nebraska. Home telehealth as discussed in this case study only came to the fore in the mid-1990s, when it was introduced to address patient need. The primary goals were to expand access, provide care as close as possible to the patient's community, and make the home the preferred place of care when appropriate. The clinical leadership of the regional VISN in South Florida and the Caribbean, VISN 8, originally conceived the program with the goal of creating a cost-effective mode of avoiding higher-cost institutional care and supporting aging veterans in their homes and communities. The initial pilot focused on the 4 percent of the noninstitutionalized veteran population in the network who were driving approximately 40 percent of costs.⁷

VISN 8 conducted a telehealth pilot from 2000 to 2003 in its integrated system of seven hospitals, 10 multispecialty outpatient clinics, and 28 community-based primary care clinics. With a population of approximately 900 patients, the pilot included monitoring along with patient self-management and use of relatively simple home telehealth devices. The pilot was associated with a 40 percent reduction in emergency room visits, a 63 percent reduction in hospital admissions, and an 88 percent reduction in nursing home bed days of care, as well as a high (94%) level of patient satisfaction. The pilot formed the basis for the model that was implemented nationally in the VHA after 2003.⁸ The national model also achieved high rates of patient satisfaction and reductions in resource utilization.

When developing the national program, the VHA's senior leadership was committed to putting into place the necessary infrastructure. Core elements included developing algorithms for selecting patients

and matching them to the right technology (e.g., video-phones, messaging devices, biometric devices, digital cameras, and telemonitoring devices); establishing a national training center to ensure a competent workforce; awarding national contracts for technology, based upon meeting strict clinical and technological requirements; and integrating telehealth technologies with the VHA's electronic medical record.⁹ Although the growth of the national home telehealth program has been managed largely at a VISN level to meet the needs of the veteran patient population each serves, the enabling clinical protocols, workforce training, and business processes have been developed at the national level. Today, CCHT programs are available at 140 VHA medical centers. Forty percent of veteran patients receiving care via CCHT live in rural or remote locations.

Resistance from clinicians has been successfully addressed by placing the emphasis on program outcomes, patient satisfaction, and training. The VHA has established strategic communications initiatives, like an annual telehealth meeting for key staff from around the country. In addition, a number of staff members who helped start the program are now in senior management within the organization and have effectively become champions of the telehealth program. Meanwhile, graduates of the national training program have gone on to serve as advocates for the program. Dr. Darkins describes their role as critical in helping solve programmatic issues at the local level and serving as ambassadors for the program. This has helped information about the program grow at an organizational level, increasing buy-in and understanding.

CCHT AND THE HOME TELEHEALTH PROGRAM

First introduced into the VHA in 2003, CCHT uses home telehealth and disease management technologies in the care management of chronically ill patients to delay, if not prevent, their being placed into long-term institutional care. Between 2003 and 2007, CCHT patients increased from 2,000 to 31,570.¹⁰ Today, the number of patients managed using home telehealth

technologies at the VHA for noninstitutional care, chronic disease management, acute disease management, and health promotion and disease prevention is almost 70,000. The VHA plans to have 92,000 people enrolled in its telehealth program by the end of 2012.¹¹ The most commonly used technologies in CCHT are messaging and monitoring devices (85%), followed by videotelemonitors (11%) and videophones (4%). Messaging devices ask patients questions to help assess their health status and disease self-management capabilities. Monitoring devices record vital sign data. Videophones and videotelemonitors facilitate audio-video consultations at home.

The VHA has used home telehealth services for managing chronic conditions at an unprecedented scale compared with other health service organizations. The VHA's underlying health information infrastructure, coupled with a strong commitment to standardized work process, policies, and training, has contributed to the increase in the program's capacity to manage an increasing volume of patients. Of patients enrolled in the program between 2003 and 2007, 96 percent were male and 4 percent were female. The age range was 20 to 101 years, with a mean of 66.5 years and 16.5 percent of patients 85 years and older. About 57 percent lived in urban areas, 37 percent in rural areas, and 2 percent in highly rural areas. About 48 percent of patients were managed for diabetes, 40 percent for hypertension, 25 percent for congestive heart failure, 12 percent for chronic obstructive pulmonary disease, 2 percent for depression and 1 percent for PTSD.¹² Almost 67 percent were monitored for one condition, and 33 percent for multiple conditions.

Within CCHT, care is actively managed by care coordinators who are health care professionals, usually nurses or social workers, but who also include dietitians, occupational therapists, physicians, and pharmacists. An individual care coordinator handles a panel of 100 to 150 general medical patients or 90 patients with mental health-related conditions. Care coordination is managed in association with the patient's clinician, and referrals to additional care services can be made by the care coordinator (subject to

appropriate delegation and scope of practice) without the patient having to be automatically seen by a primary care physician.

Ensuring the VHA has a competent telehealth workforce has been a critical component of its strategy to expand services nationwide. Standard professional training does not include telehealth. To remedy this situation, the VHA has established a dedicated national CCHT training center. Formal telehealth certification does not exist, but the VHA ensures regular competency assessments and requires that staff are trained as part of its internal reviews of telehealth programs. Care coordinators undergo a three-to-five-week intensive training course in the requisite skills and competencies. The center has trained over 5,000 staff members, to date.

Eligible patients are offered the choice to receive CCHT-based care or other noninstitutional care services. Among those offered home telehealth, only 10 percent prefer to use the more traditional in-person encounters. When a patient is enrolled, the care coordinator selects the appropriate home health technology using an algorithm based on a patient's needs, the complexity of the disease or condition, and the individual's ability to use technology. The algorithm helps determine which CCHT device (videophone, messaging device, biometric device, digital camera, or telemonitoring device) is most suitable and cost-effective for each patient's use. Upon device selection, the care coordinator gives the patient and caregiver the required training.¹³

On an ongoing basis, the coordinator reviews telehealth monitoring data and provides active care or case management. Each patient is classified on the basis of his or her risk level, which is assessed daily according to preset thresholds, with alerts if any significant changes arise in the patient's symptoms or behavior that require intervention and management. When alerts occur, care coordinators intervene as necessary. For instance, a coordinator may call a patient to verify a potential exacerbation of their condition to prevent an emergency room visit or hospitalization.

Care coordinators coordinate patients' care even when they receive care services outside the VHA

system. The VHA also provides patients with the ability to authorize sharing of electronic patient record data, such as prescriptions or lab results, through the "Blue Button" application. Blue Button is a convenient and secure method for patients to retrieve information in plain text via the Internet. In addition to the 6 million veterans who receive care through the VHA, the VHA plans to also make the Blue Button application available to the 17 million veterans who receive care at non-VHA health providers and hospitals.¹⁴

EVIDENCE OF OUTCOMES IN HOME TELEHEALTH

The VHA has found that an enterprise-wide home telehealth system is an appropriate and cost-effective means of managing chronic care patients in both urban and rural settings. Studies that compared data from the year before entering the program and six months postenrollment show a 25 percent reduction in bed days of care, a 20 percent reduction in number of admissions, and a mean satisfaction score rating of 86 percent. Decreases in health resource utilization were largest in highly rural (50.1%) and urban (29.2%) areas, for mental health-related conditions, and for patients with multiple conditions. Patients' acceptance of CCHT was high, with only 10 percent declining services. The cost for CCHT (\$1,600 per patient per year) compared favorably with the direct cost of VHA's home-based primary care services (\$13,121 per patient per year) and market nursing home care rates (an average of \$77,745 per patient per year).

Exhibit 3 summarizes the reduction in health care resource utilization (defined as hospital days of stay) by the condition monitored and for patients monitored for single or multiple diagnoses. There is wide variation across conditions. Although the reasons accounting for such variation are not exactly clear, the most likely explanation is a reflection of the case mix in that disproportionate numbers of patients are involved for specific conditions as well as the fact that certain conditions affect patients more severely than others.

Exhibit 3. Outcomes: VHA Care Coordination/Home Telehealth 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.

Leaders of other health care organizations have been dismissive of the applicability of the VHA's results, noting that the VHA is both payer and provider and therefore has completely aligned incentives and underlying systems for aggressive management of chronic diseases. However, other programs—some in highly fragmented environments—have been able to achieve similar results to those of the VHA. For instance, the Health Buddy Project, a Medicare telehealth demonstration project, was able to enroll more than 700 patients in two areas of the Pacific Northwest. The program's first phase, from 2006 to 2009, showed a 240 percent return on investment for Medicare.¹⁵

KEY SUCCESS FACTORS IN TAKING HOME TELEHEALTH FROM PILOT TO SCALE

The VHA first considered a role for telehealth in noninstitutionalized care in the mid-1990s. Rather than technology being the driver, the impetus for introducing telehealth was the need to address the care demands of chronically ill, aging veterans and

to expand access to care services and make the home the preferred place of care. The decision to implement telehealth received strong support from the VHA leadership, and a telehealth pilot involving the remote monitoring and patient self-management of nearly 900 patients was launched in 2000. The results of the pilot, which demonstrated reductions in hospital admissions and bed days of care as well as high levels of patient satisfaction, formed the basis for the model that has become the national standard in the VHA since 2003.

Although initial evidence for an innovation is necessary, it is often not sufficient for widespread diffusion. Ongoing monitoring of the clinical outcomes has demonstrated repeatedly high levels of patient satisfaction and reduced resource utilization and has supported the continued growth of telehealth within the VHA, validated the positive benefits, and strengthened the program's ability to spread home telehealth services more broadly throughout the organization.

The VHA's experience with home telehealth programs highlights the potential of alternatives to traditional care models to drive substantial benefits. The experience also demonstrates that implementation at scale is possible and can yield substantial returns across both time and geography. Successful implementation was centered around reengineering of existing processes coupled with a strong IT infrastructure and a commitment to training.

The following are key factors that have led to the VHA's ability to successfully pilot and implement home telehealth at scale.

Systematic evidence of targeted outcomes.

The pilot program validated the evidence initially found in the literature of small-scale interventions successfully using home telehealth with chronic disease patients to support independent living and reduce hospital admissions. The program has continued to demonstrate systematic evidence of targeted outcomes: reductions in bed days of care and hospital admissions, as well as high levels of patient satisfaction, all without diminishing the health status of participants. Such evidence has been important in expanding the scale of the program. As it has grown, the evidence has made a

strong clinical and business case that facilitates buy-in from clinicians and managers. The VHA has found that disseminating its findings broadly throughout the system, through an annual meeting for key staff members and a quarterly newsletter, for instance, reinforces the continuous cycle of learning within the organization.

Standardization of core program elements.

From the outset, the VHA tried to systemize clinical, technological, and business processes. A core principle of this standardized approach has been national policies and operational procedures that ensure the care a veteran receives is consistent throughout the VHA system. In addition, care coordinators monitor core biometric data and changes in patients' health status, provide support to patients through education and self-management, and intervene to prevent patients' clinical deterioration and avoidable hospital admissions.

Technology-enabled tools and resources.

The electronic patient record is a critical tool that enables just-in-time decisions that support patient care, particularly in chronic care management. The VHA's electronic health information system, VistA, has been instrumental in providing a technical health information infrastructure that supports systemwide implementation of the home telehealth program. Another important technological tool is the algorithm the VHA uses to match patients to appropriate technologies. The home telehealth devices have been chosen for their simple user interface design and ease-of-use to ensure they can be implemented systematically among a very large number of patients and perform reliably.

Staff training and development. The OTS has established national training centers dedicated to each of its three telehealth service areas with the capacity to facilitate remote training and to train hundreds of staff members each year. A robust training program has helped contribute to overcoming the initial resistance that clinicians have had to the telehealth approach. The training program for CCHT has also created a cohort of graduates who serve as ambassadors for the program and who can help solve programmatic issues at the local level.

FUTURE OPPORTUNITIES AND CHALLENGES IN MAINTAINING HOME TELEHEALTH AT SCALE

While the VHA has become known for its focus on information technology, pioneering research, high quality of care, and remote health services, the organization continues to face challenges in translating theory and pilots into mainstream services and in ensuring the sustainability of the clinical, technology, and business processes necessary to support home telehealth. Looking forward, the VHA faces a number of related goal-driven challenges.

Realizing greater economies of scale. CCHT has cited reduced health care resource use among the targeted high-utilization patients. This impact provides strong economic justification for home telehealth to be an integral component of standard noninstitutionalized care services for chronically ill veterans at risk for long-term institutional care. Because of the lower marginal cost of adding services to the existing infrastructure, the VHA is intent on expanding its CCHT program to provide chronic care management, acute care management, and health promotion and disease management for other patients in areas such as weight management, dementia care, and palliative care. In April 2011, the VHA awarded six national contracts for home telehealth devices and services worth \$1.38 billion over five years.

Advancing integrated models of care. Many veterans rely on providers other than the VHA for services, which complicates efforts to coordinate their care. This is particularly challenging as the VHA uses a primary care model that adheres to clinical guidelines and sharing of information among providers. The advent of a patient-centered medical home model on a national scale is leading the VHA to think about how care coordination for home telehealth can evolve and contribute to successful care management that ensures patients receive the right care in the right place at the right time and that patient engagement and adherence are enhanced. This issue will become increasingly important as more care takes place in the home and community, with informal caregivers playing a central

role and with individuals encouraged to take on greater responsibility for their own health management.

Adapting to continuous technological change. The VHA is looking at new and emerging technologies, such as social media and mobile devices, to aid in delivering care remotely. There are professional, ethical, technological, regulatory, legal, organizational, and risk management issues that apply to how these new technologies will be implemented, and the VHA is addressing these. The VHA also has launched numerous technology initiatives to transform itself into a 21st century organization that is people-centric, results-driven, and forward-looking. Through a new program called the Innovation Initiative, the VA has committed to being on the cutting edge of health care delivery and laying the foundation for safe, secure, and authentic health record interoperability. By tapping into the talent and expertise of individuals both inside and outside the organization, the VA seeks to identify new, innovative solutions that will increase veterans' access to VHA services, improve the quality of services, enhance the performance of VA operations, and reduce or control the cost of delivering those services that veterans and their families receive.

CONCLUSION

Because the Department of Veterans Affairs operates a large integrated delivery system financed primarily by public money, drawing lessons from the VHA's experience may be easiest for other integrated delivery networks or government-sponsored systems. The lessons of the VHA may be most applicable to the population that most resemble veterans targeted for CCHT: dual-eligibles who tend to receive care services through a fee-for-service model. Telehealth-based care coordination and management will have an impact on the quality of life and care, as well as costs associated with this population. But implementation of programs will likely need to be accompanied by the ability to reproduce the VHA's underlying systemness to comprehensively support the patient population.

Organizations can learn from the VHA's home telehealth experience on a number of levels. In particular, by using the core principles that have guided the implementation at scale: a recognized responsibility for the care and case management of patients across the continuum; a systematic approach to the introduction of a quality performance improvement and management infrastructure; contracting with technology vendors on a national scale; and implementation that is driven at the local clinical level. In addition, the VHA has a tremendous capacity for change that is instilled in the organizational culture from the national leadership and is embodied in all areas of practice.

HOW THIS CASE STUDY WAS CONDUCTED

This case study was developed through interviews with staff from the VHA's Care Coordination/Home Telehealth (CCHT) program and an examination of peer-reviewed journals, articles, and websites of the Department of Veterans Affairs. In particular, the authors would like to acknowledge Dr. Adam Darkins, who oversees the VHA's CCHT, and his staff.

The other organizations profiled in our *Case Studies in Telehealth Adoption* series are [Partners HealthCare's Connected Cardiac Care Program](#) and [Centura Health's Centura Health at Home program](#). To read them, along with a synthesis of findings from all three case studies, visit our website at <http://www.commonwealthfund.org/Publications/Case-Studies/2013/Jan/Telehealth-Synthesis.aspx>.

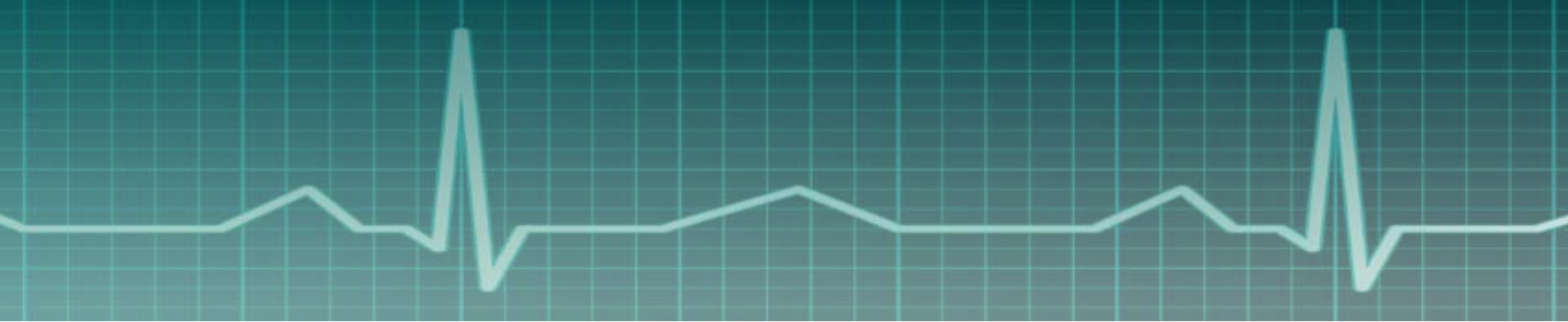
NOTES

- ¹ A. Darkins, “Telehealth Continues to Make Its Mark,” *VHA Telehealth Quarterly*, Oct. 2010 10(1):2.
- ² P. Longman, *Best Care Anywhere. Why VA Health Care Is Better Than Yours* (Sausalito, Calif.: Poli-Point Press, 2007).
- ³ C. Byrne, L. M. Mercincavage, E. C. Pan et al., “The Value from Investments in Health Information Technology at the U.S. Department of Veterans Affairs,” *Health Affairs*, April 2010 29(4):629–38.
- ⁴ S. M. Kehle, N. Greer, I. Rutks et al., *Interventions to Improve Veterans Access to Care: A Systematic Review of the Evidence*, VA-ESP Project #09–009 2011 (Washington, D.C.: Veterans Health Administration, Health Services Research and Development Service, Jan. 2011).
- ⁵ Veterans Health Administration, *2010 VHA Facility Quality and Safety Report* (Washington, D.C.: Veterans Health Administration, Office of Quality and Safety, Oct. 2010).
- ⁶ E. H. Wagner, “Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness?” *Effective Clinical Practice*, Aug./Sept. 1998 1(1):2–4.
- ⁷ R. Kobb, N. Hoffman, R. Lodge et al., “Enhancing Elder Chronic Care Through Technology and Care Coordination: Report from a Pilot,” *Telemedicine Journal and e-Health*, June 2003 9(2):189–95.
- ⁸ Ibid.
- ⁹ D. Lindeman, “Interview: Lessons from a Leader in Telehealth Diffusion: A Conversation with Adam Darkins of the Veterans Health Administration,” *Ageing International*, Oct. 2, 2010 36(1):146–54.
- ¹⁰ 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 Journal and e-Health*, Dec. 2008 14(10):1118–26.
- ¹¹ M. Freudenheim, “Wired Up at Home to Monitor Illnesses,” *New York Times*, Nov. 22, 2010, Health section, <http://www.nytimes.com/2010/11/23/health/23monitor.html>.
- ¹² Numbers reflect multiple comorbidities.
- ¹³ P. Ryan, R. Kobb, and P. Hulse, “Making the Right Connection: Matching Patients to Technology,” *Telemedicine Journal and e-Health*, 2003 9(1):1–8.
- ¹⁴ For more information, see <http://bluebuttondata.org>.
- ¹⁵ L. C. Baker, S. J. Johnson, D. Macaulay et al., “Integrated Telehealth and Care Management Program for Medicare Beneficiaries with Chronic Disease Linked to Savings,” *Health Affairs*, Sept. 2011 30(9):1689–97.

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