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

Andrew Broderick and Valerie Steinmetz

Abstract: Building on its success using telehealth to reduce preventable readmissions with home-based Medicare beneficiaries, Centura Health at Home (CHAH)—the home care unit of Centura Health—augmented its program by integrating its existing service with a clinical call center staffed by registered nurses who provide telephonic telehealth services. Results from the year-long program demonstrated successful outcomes in terms of reducing 30-day rehospitalizations, increasing patients' quality of life, improving patients' self-management skills and education, and reducing the frequency of home visits from registered nurses. Centura's experience indicates that restructuring home service coordination and educating clinical call center nurses on chronic disease management are key to a successful program. The successful integration of the two programs has led to the establishment of telehealth as the standard of care at CHAH.

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For more information about this study, please contact:

Andrew Broderick, M.A., M.B.A.
Codirector, Center for Innovation and Technology in Public Health
Public Health Institute
abroderick@phi.org

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OVERVIEW

Across the country, the average 30-day rehospitalization rate for Medicare beneficiaries with chronic conditions is 20 percent. At Centura Health, the average rate is 19 percent, of which approximately 90 percent are unplanned and preventable. Centura Health has been working to reduce its 19 percent rate of readmissions, particularly among older adults struggling with chronic conditions. Centura Health at Home (CHAH)—the organization's home care unit—has demonstrated the ability of telehealth to significantly reduce readmission rates for home care–based Medicare beneficiaries to 6 percent.

Building on its success with telehealth, CHAH recently completed a one-year program to further decrease 30-day rehospitalization rates and increase quality of life among older adults by expanding its telehealth services. The project was funded by the Center for Technology and Aging as one of five grant projects in the Remote Patient Monitoring Diffusion Grants program.[1] CHAH integrated two independent, successful home health service programs, a clinical call center staffed by registered nurses (RNs) and a remote patient monitoring (RPM)

program. The merged telehealth program expands the activities of the clinical call center to provide assistance to participants in the telehealth program 24 hours a day, seven days a week.

The year-long program reduced the frequency of 30-day rehospitalizations and home RN visits, while improving quality of life, self-management, and education among patients. The program also supported advocacy for policy change addressing payments to home care agencies for telehealth services in Colorado. The integration of CHAH staff into the telehealth program has been essential for the program's success and has led to the establishment of telehealth as a new standard of care at CHAH.

BACKGROUND

As the largest integrated health care system in Colorado, Centura Health serves communities in Boulder county, the metro Denver area, Colorado Springs, Pueblo, Cañon City, and rural and mountain communities. The integrated delivery system encompasses a network of 13 hospitals, four freestanding emergency departments, seven senior living communities, and home health and hospice services. Approximately 14,500 employees, including more than 6,000 physician partners, deliver advanced care to more than half a million people annually.

The deployment of information systems is a core tenet in Centura Health's systemwide strategic 2020 plan to improve the quality, consistency, availability, and affordability of health care to communities throughout Colorado. This also aligns operationally with the evolution of the Centura model from centers of care (i.e., individual hospitals) to a complete system of care. Establishing electronic health records linking physicians, clinics, hospitals, long-term care facilities, and home care services has been central to Centura's strategic investments in information technology.

Centura Health at Home (CHAH) was founded in 1997. It is a division of Centura Health and a nonprofit, faith-based, home health care organization that provides a broad continuum of services, including home care, rehabilitation therapies, and senior living options, to more than 20,000 patients and members of their families, many of whom are older adults. CHAH serves patients and residents in their own homes, nursing homes, residential centers, and hospitals, and employs more than 1,300 employees to serve communities across the state. Today, CHAH is the largest home care provider in the state, with more than 400 clinical staff and associates, including registered nurses, physical therapists, occupational therapists, speech therapists, medical social workers, and chaplains.

CHAH is the first home health agency in Colorado to have implemented a telehealth system. The agency's integrated clinical call center–telehealth program represents a culmination of efforts that originally began in 2004 with video-based interventions for a small population of high-acuity patients enrolled in a managed Medicare plan. Telehealth has enabled CHAH to visit with patients in between scheduled in-person home visits to reinforce the education process and to maintain closer contact with patients. Traditionally, eligible participants meet the Medicare home health benefit and for these patients there has been no program cost for participation.[2]

INTEGRATION OF THE CLINICAL CALL CENTER AND TELEHEALTH PROGRAMS

The integrated program broadens the clinical call center's capabilities to include telehealth assistance and coordinated care. This clinical call center also extends the reach of telehealth-enabled care to include patient populations who would otherwise not be eligible for home care services under the Medicare homebound benefit. The evaluation criteria used for inclusion in the telehealth program has been broadened to include all patients readying for discharge from the hospital, regardless of their eligibility under Medicare for home care services. The program extends the continuity of care on a 24/7 basis, more effectively uses existing health care resources, and extends the reach of a limited nursing staff to manage a larger number of patients on a daily basis (Exhibit 1).

Exhibit 1. Centura Health at Home Integrated Telehealth Program

- Remote monitoring of patients by registered nurses and augmented with 24/7 clinical call center and telehealth services
- Patients identified for and introduced to the program during a hospital admission or upon enrollment in CHAH
- "Real-time" patient education, lifestyle management, and medication adjustments

Who is eligible?	Who is *not* eligible?

• Patients who have any of the following:
  ° chronic disease (e.g., congestive heart failure, chronic obstructive pulmonary disease, hypertension, diabetes)
  ° fall risk factors
  ° age 80 or older
  ° two or more hospitalizations in past six months
  ° two or more emergency room visits in past six months
  ° taking five or more medications
  ° documented history of nonadherence to prescribed regimen
  ° any other indicator that they may return to the hospital in 30 days or less
• For telephonic telehealth-only program: patient does not qualify for Medicare homebound benefit
• Patients covered by Medicare, Medicare Advantage plans, and Medicaid
	• Active substance abusers
	• Unsafe home environment
	• Pest control problems
	• Patients with documented violence/aggression
	• Patients with advanced dementia, unless they have a competent caregiver
	• Patients with low functional vision, unless they have a competent caregiver

Source: Centura Health at Home.

Initially, CHAH sought to enroll at least 200 patients eligible for home care, and to increase the number of patients served in the program by a minimum of 200 per year. Of CHAH's Medicare patients, 70 percent require home care. One-third of these patients are using telehealth and this proportion is continuously growing. On average, a home care nurse can see five to seven patients a day during in-person home visits, whereas a telehealth nurse can monitor 60 to 70 patients a day. The increase in the monitoring caseload managed by telehealth nurses has been gradual as Centura has refined processes, developed the skills of monitoring nurses, and transitioned to a new monitoring platform. The number of patients a telehealth nurse can manage in a day is expected to continue to increase to close to 100 patients in the future.

The telehealth component of the program uses remote patient monitoring technology for the daily measurement of patient indicators, including vital signs, weight, and behavioral health, with remote monitoring of data conducted by RNs. The clinical call center–based program, which has been in existence for more than 20 years, broadens the traditional clinical call center's capabilities to now include telehealth assistance and coordination of care for patients utilizing remote patient monitoring, while also generating a telephonic telehealth-only treatment group that extends the reach of care to patient populations not meeting the Medicare home health benefit. Integrating the clinical call center with the telehealth program has also allowed CHAH to adapt the traditional clinical call center's business marketing model to a clinical business model to support a more robust telehealth program.

Patients were recruited in the Denver Metro area at two Centura Hospitals, St. Anthony's Central

and Porter Adventist Hospital. The typical participant was an older adult (average age of 76), living in his or her own home, managing comorbid conditions, and had recently experienced a hospitalization related to an exacerbation of a chronic health condition. Among patients, 44 percent were diagnosed with congestive heart failure, 34 percent had chronic obstructive pulmonary disease, and 17 percent were diabetic.[3] Because nurses at the clinical call center were familiar with the use of telephonic technology but lacked training on information technology, the program emphasized support for nurse training and education in information technology.

Patients participating in the project were stratified into two categories. The first group used remote patient monitoring technologies and had access to the 24/7 clinical call center. A second tier of patients who did not qualify for the Medicare homebound benefit and tended to be more physically capable of caring for themselves received telephonic telehealth care through the clinical call center. On average, the patients in the first group are enrolled in the program for 60 days. Patients transmit monitoring data on a daily basis, or more often if the condition requires close monitoring. For patients in the second group, clinical call center RNs set up weekly calls over a three-week timeframe after discharge to review medication lists and management, compare medications to discharge orders, and educate patients using a teach-back technique that highlights patients' level of understanding regarding their condition and lifestyle behaviors. Upon completion of the project, the duration of the telephonic care intervention was extended to four weeks. During each call, nurses identified potential medical issues and decided which follow-up interventions were needed.

Under the new integrated program, the first group of patients using RPM received a base station that displays and collects behavioral and general health questions, as well as vital sign data from peripheral devices. Baseline parameters are set using input from primary care physicians, as well as a telehealth algorithm, which is customized for each patient using 2,000 different elements, based on patient health history, current health status, and educational needs. Patients are given peripheral devices, including a scale, blood pressure cuff, pulse oximeter, and thermometer. They are monitored on a daily basis and transmit data through the phone line at least once daily, and more if the condition requires it. Within 48 hours of discharge, home care field nurses visit and conduct health and environmental risk assessments. In the following 24 hours, a telehealth technician visits the patient at home to install and familiarize patients with the remote monitoring technology. Nurses and installers are trained to use the teach-back technique to assess the patient and family's level of understanding and commitment. At the same time, primary care physicians write up PRN orders (i.e., "as needed" orders that nurses can modify), which allow the monitoring nurses to react to trending and monitoring data within a specified set of parameters.

Once operational, dedicated telehealth nursing staff monitor patient data from the remote devices and call the patient if there are significant vital sign or health status changes. Patients are also able to contact the clinical call center with questions 24/7. When telehealth patients call, call center RNs can review patient data, provide assistance, and escalate the alert to a physician, if needed. Primary care physicians are closely involved in the program and monitor patients' progress by reviewing weekly reports containing the patients' current medication list, vital sign and symptom readings, and nursing notes. For patients in the second group who are solely using the clinical call center as their telehealth strategy, clinical call center RNs set up a series of weekly follow-up calls after discharge to review care management plans and issues related to patient self-efficacy.

Patients can be discharged from the remote patient monitoring program when they no longer meet home care criteria. Patients in the telephonic telehealth intervention are discharged when the three weekly calls are complete or the patient self-discharges from the telephonic component. The program prepares patients for eventual discharge by teaching them how to independently monitor core health indicators and to identify red flags so they know when to contact their clinicians.

EVIDENCE OF OUTCOMES

Prior to the implementation of the integrated program, the telehealth program at CHAH demonstrated a reduction in hospital readmissions to 6 percent, from the average 19 percent rate at Centura Health. The goal of the merged telehealth program was to expand access to the telehealth program for a broader population of older adults in Centura's hospital system most responsible for the systemwide 19 percent readmission rate. Specific goals were to enroll at least 200 patients, decrease 30-day readmission rates related to congestive heart failure, chronic obstructive pulmonary failure, and diabetes at participating Centura hospitals by 2 percentage points, and measurably increase participants' quality of life. About one-quarter of the 200 patients used telephonic telehealth, while the majority used remote patient monitoring with access to the clinical call center.

Results from the program show that 30-day rehospitalizations related to congestive heart failure, chronic obstructive pulmonary failure, and diabetes were reduced by 62 percent, and rehospitalization rates for patients receiving telehealth home care (6.3%) were significantly lower than those for traditional home care patients (18%). Emergency department use decreased from 283 visits in the year preceding the study to 21 visits during the year-long study. Quality of life, which was measured at baseline and at the end of the study period using the SF-36 scale that examines health and wellbeing across eight physical, mental and social aspects, showed a statistically significant increase for patients receiving home telehealth care in specific age groups and sexes with comparatively greater increases for women compared with men, but did not present a statistically significant increase in overall quality of life. Patient satisfaction and self-management, measured on a monthly basis using Centura's telehealth patient satisfaction tool, showed positive perceptions and beliefs about health technology, patient satisfaction with the technology, and self-management. The frequency of RN visits was reduced from the traditional two to three visits per week over a 60-day episode of care to approximately three visits over the entire 60-day telehealth care management period. The resulting cost savings is between $1,000 and $1,500 of total costs per patient.[4]

Over the course of the year-long program, there were seven readmissions for 87 patients with congestive heart failure, three for 67 patients with chronic obstructive pulmonary disorder, and no readmissions for the 34 patients with diabetes (Exhibit 2).

Quality of life was measured at baseline and at the end of the study period using the SF-36 scale that examines health and well-being across eight physical, mental and social aspects. An increase of five points is statistically significant. The project found that quality

Exhibit 2. Program Readmission Rates: Centura Health at Home Remote Patient Monitoring

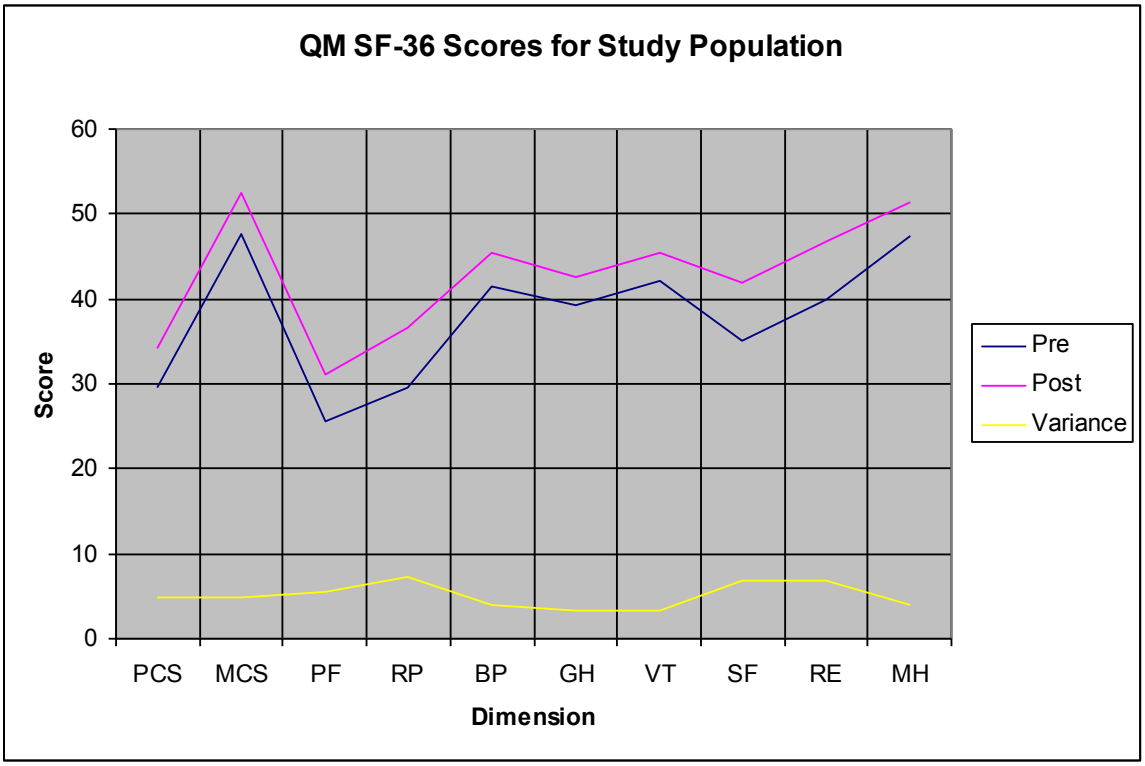
Facility and condition:	Pre-intervention readmission rates	Post-intervention readmission rates (n=200)
St. Anthony's Central		
• Congestive heart failure	13.8%	4.2%
• Chronic obstructive pulmonary disease	14.1%	6.7%
• Diabetes	14.7%	0.0%
Porter Adventist Hospital		
• Congestive heart failure	17.7%	9.5%
• Chronic obstructive pulmonary disease	12.5%	2.7%
• Diabetes	9.5%	0.0%

Source: Data provided by Centura Health at Home, reporting outcomes to the Center for Technology and Aging.

of life increased for patients receiving home telehealth care, averaging a 4.8 point increase in both the physical and mental health components (Exhibit 3). While these results were not statistically significant overall, specific components of the quality-of-life survey demonstrated statistically significant changes in all ages and sexes: physical functioning, role limitation due to physical problems, social functioning, and role limitation due to emotional problems. There were statistically significant improvements for 45-to-54-year-olds, 65-to-74-year-olds, and individuals 75 and older.

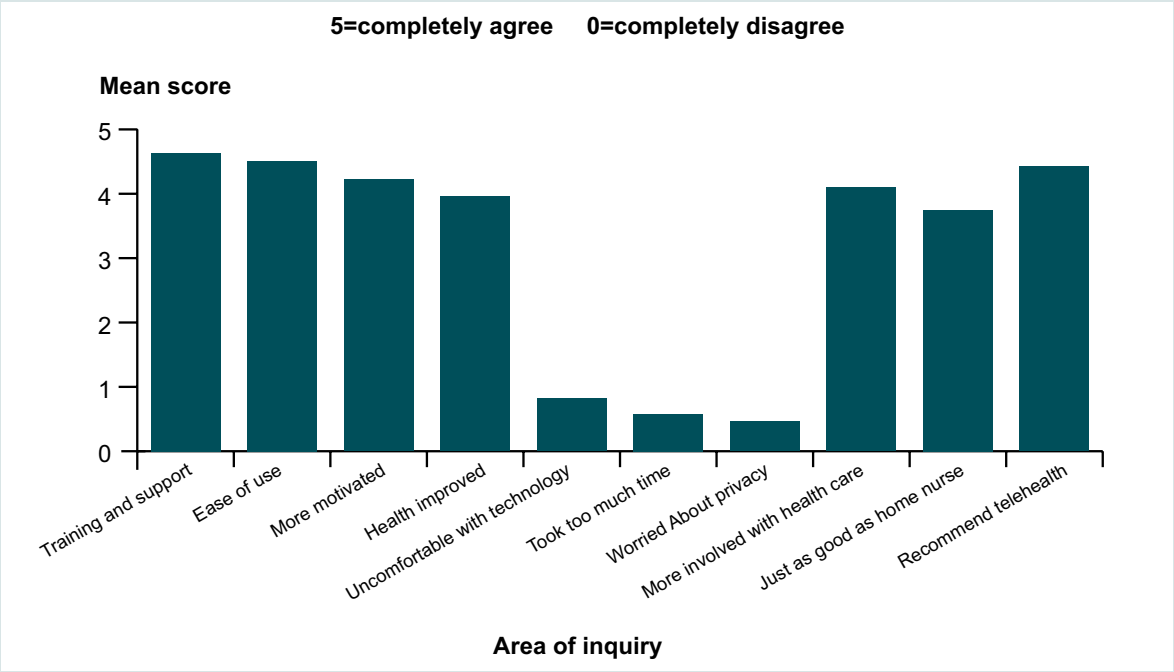
Patient satisfaction and self-management was measured with the Centura telehealth patient satisfaction tool, which was developed specifically for this project and has received a large uptake of use from subsequent Center for Technology and Aging grantees. In reviewing surveys about older adults' perceptions and beliefs about health technology, several key points were addressed, such as privacy concerns, time of use, involvement in one's health care (patient self-management), and quality of care (Exhibit 4). The survey was created on a five-point Likert scale taken from the Coleman Care Transitions Survey that was developed and tested for use with older adults.[5] Satisfaction scores were not assessed for statistical significance; rather they were viewed in aggregate form only for Centura's own knowledge, as opposed to individual patients' pre- and post-study. Exhibit 3 shows the monthly patient satisfaction and self-management scores of all patients using telehealth.

Exhibit 3. Quality of Life SF-36 Results:
Centura Health at Home Remote Patient Monitoring



Code key:	
PCS = Physical Component Summary	GH = General health
MCS = Mental Component Summary	VT = Vitality
PF = Physical Functioning	SF = Social Functioning
RP = Role-Physical	RE = Role-Emotional
BP = Bodily Pain	MH = Mental Health

Exhibit 4. Telehealth Patient Satisfaction Survey Results: Centura Health at Home Remote Patient Monitoring



LESSONS LEARNED

Lessons learned at CHAH from the integration of telephonic telehealth with home telehealth highlight several critical program areas for the successful implementation of telehealth at scale and on a sustained basis: staff engagement; training and support; working with vendors to select solutions that scale while meeting the broader patient population's needs; and modifying care management practices to reflect telehealth-enabled efficiencies.

Staff engagement and buy-in are critical to program success. For the program to be successful, home care nurses and clinicians must see value in the telehealth intervention for patients, nurses, and physicians. One potential strategy is hosting an open house for the home care nurses to interact with the telehealth technology and ask questions. Key discussion points used during such events should demonstrate the value of the telehealth intervention to patients, nurses, and clinicians by focusing on outcomes, visits/episode, rehospitalization rate, as well as patient satisfaction data. Discussing how the program can improve chronic disease management by extending the reach of the nursing staff can demonstrate the value of the intervention without negatively affecting the workflow of clinicians. As a result of the improved chronic disease management in the program, field nurses were able to focus their time and attention on visits dictated by urgent health circumstances, rather than regular assessments, which can be routinely conducted via telehealth equipment.

Effective nurse communication training is vital to patient enrollment and engagement. Home Service Coordination Nurses—the nursing staff who introduced patients to the program during their hospital stay—required additional training for effective communication, particularly to emphasize the value of the program to patients. Clinical call center nurses also benefited from effective communication training to bolster confidence in decision-making processes to actively manage patients in response to issues raised during calls. Training focused on key words and phrases that are simple yet effective in describing the program and on the intended outcomes for the patient. There was also some scripting of the initial RN call to the patients after the technology installation, as well as

key elements for the installers in teaching patients and families.

Traditional clinical call center nurses require additional disease management education. Clinical call center nurses also underwent specific disease management education that improved their problem-solving and critical-thinking skills while fostering confidence. Among the challenges encountered, clinical call center nurses who were previously accustomed to directing patients with symptoms to emergency rooms required training on the new paradigm, which emphasizes chronic disease management at home.

Streamline the discharge planning process to incorporate enrollment into the telehealth program. Centura's experience indicates that attention to coordinating home care services is a key factor to program success. As part of the program, the home service coordination discharge planning process was restructured in the hospital. Case managers were trained to identify patient eligibility and enrollment criteria for patients discharged without home care. Before discharge, patients are introduced to the telehealth intervention in the hospital. Within 48 hours of discharge, a personalized telehealth algorithm is created and telehealth technicians install devices and train patients on how to use them. This streamlined process encourages patient and caregiver engagement as they begin to follow their treatment plan at home.

Patient telehealth program enrollment is most effective when introduced by a trusted clinician. Patients were most likely to enroll in the telehealth program when they were introduced to the program during the hospital stay by a home care nurse or physician or by a primary care physician after discharge. Once patients were enrolled, repeat visits from the telehealth device installer were required to train elderly adults on using the technology.

Select a technology that will work in the long term. The original program design involved use of either two-way video technology, to meet the needs of patients' with a very high acuity level, or remote patient monitoring technology, to more routinely monitor patients with chronic conditions. 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. In particular, the new platform offers the ability to only monitor those patients who fall outside established parameters, thereby placing the emphasis on those patients needing immediate attention.

Establish physician PRN orders for telehealth patients to maximize efficiency. Monitoring nurses are able to react to trending and monitoring data more quickly by utilizing physician PRN orders. To operate on a larger scale, physicians should establish the orders when patients are initially enrolled into the program.

Provide real-time education to patients to increase patient self-management. The monitoring nurses can connect with patients in real time, helping patients understand the relationship between cause and effect of lifestyle-related behaviors. For example, if nurses observe data such as missed medications or meals high in salt, they have the opportunity to educate the patient and make the correlation between actions and outcome.

DISCUSSION

The current program was designed to demonstrate the impact of a telehealth-based program on 30-day readmissions, particularly in light of looming policy changes that will penalize hospitals for what are deemed to be excessive rates of avoidable readmissions for congestive heart failure and other conditions. The project demonstrated that the use of remote patient monitoring technologies 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. The results support the sustainability of the intervention, with plans to extend the telehealth component within CHAH and to senior living communities to reach 1,000 adults by 2012 and 2,000 patients by 2013. At the state level, CHAH used the emerging evidence base in its

work with the Home Care Association of Colorado to pass Telehealth Rule 8.520. The law now allows direct payment for Medicaid patients in the remote patient monitoring intervention receiving home care telehealth services. Making telehealth the standard of care at CHAH, and not the exception, aligns with Centura's 2020 strategic plan, which expects changes to payment systems to support how, where, and when a hospital provides care.

How This Case Study Was Conducted

This case study was developed through interviews with staff from Centura Health at Home (CHAH) and quarterly reports from the Center for Technology and Aging's CHAH Remote Patient Monitoring Program. In particular, we would like to acknowledge Erin Denholm, CEO; Ellery Aiken, former director of Telehealth and Disease Management; and Melody Wright, vice president of Patient Care Services, for their assistance in preparing this case study.

The other organizations profiled in our *Case Studies in Telehealth Adoption* series are the Veterans Health Administration's Care Coordination/Home Telehealth program and Partners HealthCare's Connected Cardiac Care Program. To read them, visit our website at http://www.commonwealthfund.org/Publications/Case-Studies/2013/Jan/Telehealth-Synthesis.aspx.

NOTES

1 http://www.techandaging.org.

2 The Medicare home health benefit pays a 60-day episodic rate for home health care, including remote patient monitoring, when four criteria are met: the older adult is homebound, requires skilled care on an intermittent basis, a physician signs a home health certification, and the patient receives care from a Medicare-certified home health agency.

3 Every participating patient has comorbidities and the numbers reflect this overlap.

4 Centura Health at Home, reporting outcomes to the Center for Technology and Aging.

5 http://www.caretransitions.org.

About the Authors

Andrew Broderick, M.A., M.B.A., is codirector, Center for Innovation and Technology in Public Health, at the Public Health Institute. Mr. Broderick's research focuses on the adoption and appropriate use of technology to address vital and pressing challenges in public health, including efforts to enhance linkages between the public health and health care delivery systems. Mr. Broderick previously managed research activity at HealthTech, including work in cardiovascular disease, remote health services, and technologies for independent living. Mr. Broderick holds a master of arts in economics and geography from Trinity College, in Dublin, Ireland, and a master of business administration from San Francisco State University. He can be emailed at abroderick@phi.org.

Valerie Steinmetz, program director for the Center for Technology and Aging at the Public Health Institute, leads the Remote Patient Monitoring and mHealth Diffusion Grants Programs. These programs focus on the accelerated adoption and diffusion of technology-enabled chronic disease care that benefits older adults and is patient-centered, coordinated, efficient, and effective. Ms. Steinmetz previously coordinated research in key clinical areas at The Health Technology Center. Ms. Steinmetz graduated from the University of California, Berkeley, and is currently enrolled in Emory University's M.P.H. program in applied epidemiology.

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