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Original Study

Implementation of Telemedicine Consultation to Assess Unplanned Transfers in Rural Long-Term Care Facilities, 2012–2015: A Pilot Study

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A B S T R A C T

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Introduction: Public and private entities in the United States spend billions of dollars each year on potentially avoidable hospitalizations. This is a common occurrence in long-term care (LTC) facilities, especially in rural jurisdictions. This article details the creation of a telemedicine approach to assess residents from rural LTC facilities for potential transfer to hospitals.

Methods: An electronic LTC (eLTC) pilot was conducted in 20 pilot LTC facilities from 2012–2015. Each site underwent technologic assessment and upgrading to ensure that 2-way video communication was possible. A new central “hub” was staffed with advanced practice providers and registered nurses. Long-term care pilot sites were trained and rolled out over 3 years. This article reports development and implementation of the pilot, as well as descriptive statistics associated with provider assessments and averted transfers.

Results: Over 3 years, 736 eLTC consultations occurred in pilot sites. One-quarter of consultations occurred between 10 PM and 9 AM. Overall, approximately 31% of cases were transferred. This decreased from 54% of cases in 2013 to 17% in 2015. Rural pilot facilities had an average of 23 eLTC consults per site per year.

Discussion: Averted transfers represent a dramatic benefit to the residents, as potentially avoidable hospitalizations cause undue stress and allow for nosocomial infections, among other risks. In addition, averting these unnecessary transfers likely saved the taxpayers of the United States over \$5 million in admission-related charges to Centers for Medicare and Medicaid Services (511 avoided transfers × \$11,000 per average hospitalization from a LTC facility).

Conclusions: Overall, the eLTC pilot showed promise as a proof-of-concept. The pilot’s implementation resulted in increasing utilization and promising reductions in unnecessary transfers to emergency departments and hospitalizations.

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Potentially avoidable hospitalizations (PAHs) from long-term care (LTC) facilities cost the United States taxpayers an estimated \$11,000 per admission, on average.^{1,2} If a substantial proportion of these transfers could be averted, hundreds of thousands of patients would

avoid the unnecessary stresses, infections, and other adverse effects associated with hospitalizations.¹ Hundreds of millions to billions of dollars could also be saved.^{1–3} Reducing PAHs, especially in the form of readmissions, is a major national objective.⁴ Because LTC facilities are a major source of hospital admissions and readmissions, they are a natural part of public and private initiatives in this arena.^{1,5–7} The Agency for Healthcare Research and Quality estimates that PAHs accounted for 35% of all-cause hospitalizations among skilled nursing facility residents in 2008.⁸ One potential avenue for decreasing PAHs is telemedicine.

In the late 1990s and early 2000s, telemedicine broadly was in its infancy, and even more so specifically in the LTC arena.^{9–11} Cost, technical issues, and acceptance of the use of telemedicine in this

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context were all identified as significant barriers. However, organizations also began to research the potential benefits for telemedicine, especially around impacting a particularly problematic aspect of care—when and whether to transfer a resident to a hospital.^{12–14} This transfer decision was especially problematic in rural areas and during nights and weekends, where it might be more difficult to get an on-call clinician to a long-term facility in a timely fashion to either assess for a transfer or attend to an otherwise nonurgent issue. Research has shown telemedicine brings potentially substantial savings and improvement in a patient's quality of life associated with averting PAHs.^{1–3,15–20} Telemedicine may also provide a reasonable compromise to the Centers for Medicare and Medicaid Services' (CMS) proposed rule requiring onsite evaluation prior to transfers of a LTC resident. The provision's onsite evaluation requirement has been challenged by facilities and trade groups as "dangerous for patients", too costly, and burdensome, especially for rural jurisdictions where there may be a lack of appropriate providers in proximity.^{21,22} CMS has received over 9800 comments about its proposed package of reforms for LTC providers aimed at improving patient safety and quality of care, and saving money (CMS-3260-P).²³

LTC in the Avera Health System

Avera Health is an integrated health system spread over a wide region of Iowa, Minnesota, Nebraska, and South Dakota and includes 32 hospitals, primary care clinics, and several postacute facilities. Avera's systems experience many of the same transfer issues identified by scholars and policymakers over the past decade.^{22,24} In addition, Avera faces challenges in the provision of LTC to residents who may need to access urgent and/or specialty outpatient healthcare in their community. Residents largely live in small, geographically dispersed rural communities that are facing the broader issue of a growing shortage of physicians and other healthcare workers.^{25–27} In addition, residents are often medically complex and/or frail, which can make transfers challenging.²⁸ This article details the conceptualization and implementation of electronic LTC (eLTC) operations, which serves 34 facilities and 5000 residents as of early 2016. The article details implementation of an initial pilot, funded by the Health Resources and Services Administration's Federal Office of Rural Health Policy (FORHP), which led to a recently initiated eLTC scaling-up project funded by a multimillion award from the federal government.

Development and Implementation

Avera's eLTC pilot model, which launched in 2012, represents the culmination of over a decade's worth of work in the creation of telemedicine infrastructure, programs, and processes. In 2002, Avera partnered with a technology firm to create an electronic intensive care unit (eICU™) care program. This eLTC model was conceived out of necessity; Avera's main base of operations (South Dakota) is largely rural, and many of the patients and ICUs within the region needed instant access to high-quality clinicians during urgent and emergency

events. The eICU program grew into Avera's eCARE approach, which includes eEmergency, ePharmacy, eCorrectionalHealth, and now eLTC. Avera's "virtual health system" serves 545,000 square miles across 10 states and has provided services to over 965,000 patients at 250 locations; its eEmergency service line is in 10% of the nation's Critical Access Hospitals.²⁴ eLTC services are among the newest part of the virtual medicine program at Avera and have presented somewhat different challenges than previous programs in the eCARE suite.

By their nature, LTC facilities exist in, and are reflective of, their communities, both urban and rural. The rural communities, especially, were the focus (and driver) of the eLTC expansion. On average, the 14 sites that were part of the FORHP-funded pilot were in communities with fewer than 10,000 people. The communities largely consist of below- or at-poverty individuals.²⁹

Conceptualization of an eLTC Pilot Program

The eLTC project was born out of challenges inherent to these populations in a rural context, such as high acuity LTC patients and fewer providers, especially in specialty care. Internal quality reviews of Avera's system's and affiliated LTC transfers revealed that a sizable proportion of transfers to emergency departments and subsequent hospitalizations were potentially avoidable. Complex, substantial needs had been identified, and Avera leadership believed eLTC might be an avenue to address these needs. The practicality of a pilot grew out of early research highlighted by the American Telemedicine Association, especially Weiner's 2004 study on using a portable telemedicine system to facilitate connection to on-call physicians between 5 PM and 1 AM.¹³ The study's findings suggested Avera could potentially improve quality of care while avoiding unnecessary transfers.

In 2010, the eCARE group concluded Avera would implement a 24/7 pilot model of telephonic- and video-based consultation in some of our rural and extremely rural facilities. This pilot would involve installing 2-way video and peripherals, allowing real-time communication between residents and providers in our facilities with on-call specialists. Specialty equipment, such as a 2-way stethoscope and high-definition camera, allowed providers to listen to lungs, heart, and abdomen at a distance, as well as gaining a closer view of the patient as needed.

A core group of staff were hired, including a director of eLTC, a service line manager, 2 advanced practice providers, and 3 registered nurses. Avera staffed the telehealth "hub" that eLTC pilots contacted with advanced practice providers and registered nurses. Next, the program created information technology (IT) requirements for each pilot site; the process is outlined in Table 1. The program staff ascertained that some sites would more easily be able to adopt the desired mobile platform approach than others; for those sites that were not mobile-ready, the IT infrastructure was upgraded. Staff implemented a number of processes to ensure smooth rollout of the pilot program, including quarterly meetings with leadership, the creation of an implementation plan (with

Table 1
Implementation Process for Facility eLTC Readiness

Initial conversation and needs assessment	Identify lead and key contacts at the facility; send materials; meet with staff and complete site assessment; send provider information documentation
Local leadership on-boarding	Obtain facility demographic information, conduct presentations, tour facility, obtain network upgrade quotes
Contracts	Send service agreements, physician letters, connectivity contracts, bill of materials, and meet with staff and providers
Implementation	Enable EHR access, schedule weekly implementation meetings, install and test equipment, train staff, provide informational materials to residents
Training	Deliver site training for leadership and staff including workflow redevelopment, conduct extensive technology checks, schedule planned follow up calls to address post-implementation issues or training needs, schedule monthly eLTC program calls
Implementation finalized	Resolve outstanding issues, create after-action report, establish process for monthly site reports

EHR, electronic health record.

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