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**Impact of After-Hours Telemedicine on
Hospitalizations in a Skilled Nursing Facility**

Impact of After-Hours Telemedicine on Hospitalizations in a Skilled Nursing Facility

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The benefit of primary care provider (PCP) services in skilled nursing facilities (SNFs) has been demonstrated through many studies and embraced by several care models, such as the Special Needs Plan (SNP) and the Program for All-inclusive Care for the Elderly (PACE). Both SNP long-term care models and PACE have demonstrated improved outcomes through increased clinical services. CMS, realizing this benefit, moved to require an in-person PCP evaluation through their proposed rule in 42 CFR § 405, 431, 447, et al, Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities.¹ In this rule, CMS proposed to require an in-person evaluation of a resident by a physician, a physician assistant, nurse practitioner, or clinical nurse specialist before an unscheduled transfer to a hospital. This proposal was founded in the belief that in-person clinical evaluations of SNF residents reduces unscheduled transfers through improved care in the SNF.

Although this CMS proposed rule was not enacted, the principles upon which this requirement was founded (improved quality of life for SNF residents and cost savings) are being embraced by others. Specifically, new accountable care models, such as accountable care organizations, bundled payments, and Comprehensive Primary Care, are attempting to deploy bedside clinical evaluation prior to unscheduled emergency department (ED) transfers from SNFs.

On-site, bedside clinical management for a change of condition in SNF patients is believed to result in improved care and reduced avoidable hospitalizations. However, PCPs are not always available on site in the SNF, especially outside of normal workweek hours.

In an effort to evaluate the effectiveness of an after-hours telemedicine-enabled coverage service, the Fan Fox and Leslie A. Samuels Foundation provided a grant to support the integration of TripleCare (TC), a physician group specializing in caring for medically frail patients through telemedicine, into a 365-bed nonprofit SNF in Brooklyn, New York, for 1 year starting in March 2015. The TRECS (Targeting Revolutionary Elder Care Solutions) Institute oversaw the implementation of the study and the evaluation of outcomes.

METHODS

Prelaunch activities included Wi-Fi upgrades in the facility, meetings between TC's clinical team and the facility's medical staff (medical director, attending physicians, and managed care nurse practitioners), obtaining electronic health record (EHR) read-only access, establishing an emergency medication supply to support the clinical practice, and training the nursing staff on how to use the technology and when to call TC.

Intervention

When nurses identified a change in condition (ie, fever, shortness of breath, chest pain) (**Table 1**) during the service's hours of operation (Monday through Thursday 6 pm to 7 am; Friday from 6 pm, all day Saturday and Sunday, through Monday at 7 am; and 6 major holidays), they placed a call to TC's toll-free number and gave a report directly to the TC physician. The physician supplemented the patient history by accessing the facility EHR. When the patient's clinical status warranted a physical exam, the nurse would transport the telemedicine unit to the patient's bedside and the physician would access the unit through software installed on the physician's computer. The telemedicine unit was designed for simplicity and use in the SNF. The nurse and physician would "meet" in the patient's room, using bidirectional secure video conferencing to interview the patient when possible and collaboratively complete an appropriate physical exam using the unit's digital stethoscope and 18× zoom camera. Based on the information from the nurse's report, data found in the EHR, the patient exchange, and the physical exam, a working diagnosis was developed and a plan of care created and executed. Frequent follow-up interactions occurred as indicated and a note and order set were faxed to the facility to be included in the patient's medical record.

The TC physician contacted the attending physician or nurse practitioner when the need arose during an encounter; otherwise, he or she provided them with a patient report the morning of the next business day following the encounter. The patient's family member or

significant other was contacted if the patient was very ill or there was a need to address advanced directives. The TC physician contacted the local hospital ED if a patient had received on-site care but did not improve or if a procedure (eg, intravenous [IV] access, gastrostomy tube replacement) or diagnostic test (eg, head computed tomography) was needed and the SNF could provide care once the procedure was completed or the test was negative.

Data analysis was done by the TRECS Institute in collaboration with the facility and TC. Census and insurance-related data were obtained from the facility billing system. Patient/resident encounter information was obtained from reports and data extractions from TC's and the facility's EHRs.

With regard to interoperability and the Health Insurance Portability and Accountability Act (HIPAA), although the facility and TC HIPAA-compliant EHRs were not integrated, each had HIPAA-compliant access to each other's record system. Additionally, a secure fax was sent after each patient visit, which was uploaded into the patient's EHR chart.

For the purposes of estimating the financial impact of the after-hours program, several assumptions were made. For long-term residents who experienced an avoided hospitalization, the facility estimated that 25% of these residents, when they do go to the hospital, qualify for the Medicare rehabilitation payment benefit for a period of 15 days.

During the period of study, the SNF introduced no new significant delivery system changes and had the same director of nursing and medical director.

RESULTS

The project took place from March 2015 to March 2016. The facility's bed census remained constant at 365, of which 44 were dedicated short-term beds. From 2014 through 2016, the facility occupancy ranged from 97.4% to 98.3%, with the number of admissions per year at 957, 1045, and 947 in 2014, 2015, and 2016, respectively. TC physicians completed 313 encounters with a wide variety of diagnoses (Table 1). Of these encounters, 105 were identified by the TC physician as being avoided hospitalizations. Avoided hospitalizations are defined as those episodes of care that would have been expected to result in ED evaluations if routine after-hours telephonic care with the attending or their covering physicians were called to provide care. A retrospective review by the facility's medical director, who was not associated with TC, of all encounters identified by the TC physicians

as avoided hospitalizations resulted in a consensus that 91 of the encounters actually represented avoided hospitalizations. Of the 313 total encounters, 54 (17%) resulted in ED transfers and 259 (83%) were treated on site. The preceding year, 490 patients were hospitalized from the facility compared with 402 during the study period, representing an 18% reduction in the number of patients transferred to the hospital.

Payers were the major financial benefactor of TC. Treating patients on site eliminated Medicare's payment to the hospital, the emergency ambulance, and the facility for the skilled days that some of the patients would have received following a 3-day qualifying Medicare acute care stay. Of the 91 avoided hospitalizations, 31 were individuals whose SNF stay was covered under a Medicare Advantage plan, 57 were dual-eligible individuals (those enrolled in Medicare and Medicaid) whose SNF stay was covered under Medicaid, and 3 were privately paid. Of the 57 individuals covered by Medicaid who avoided hospitalization, the facility estimated that, based on their clinical status, 14 (25%) would have been eligible for Medicare benefits had they experienced a hospitalization and returned to the facility. Because they remained in the SNF, they did not convert to Medicare, resulting in Medicare savings. Based on the 91 patients with avoided hospitalizations, the total Medicare savings were estimated to be more than \$1.55 million in this 1 SNF during this period (**Table 2**). According to the HHS Office of Inspector General in 2013, the average hospital admission cost in Brooklyn, New York, was \$15,000.¹ This translates to an annual Medicare cost savings of \$500,000 in an average-sized SNF of 120 beds, or \$4167 per bed.

The SNF paid \$60,000 annually for this service (including the technology). This fee was offset by preventing hospitalizations; helping the facility maintain census, especially in its short-term rehabilitation unit; capturing lost Medicaid days while a patient was hospitalized; and a decrease in transportation costs. It is estimated that the facility netted \$20,000 above the cost of the program. The facility continues to support this clinical service.

DISCUSSION

As each segment of the healthcare industry is subject to regulatory and reimbursement challenges, the nursing home industry is experiencing a torrent of change and is struggling to remain relevant and financially sustainable. Hospitals have experienced progressively higher financial penalties and payment reductions based on rehospitalization rates,² and nursing homes are now experiencing similar penalties and incentives.^{2,3} To reduce the likelihood of readmissions, hospitals are narrowing the network of nursing facilities to

which they discharge patients. These decisions are driven by star ratings and facilities' return-to-hospital (RTH) rates. There are many factors impacting facility RTH events (eg, patient acuity, comorbidities, facility preparedness, nursing home staff turnover rates, and availability of healthcare practitioners to care for acutely ill patients "in house").⁴ To provide safe and advanced medical care for postacute patients within the SNF, many facilities have invested in their physical infrastructure, creating specialized areas with additional staffing, and have embraced the on-site nurse practitioner model. There has been a broad acceptance and integration of Interventions to Reduce Acute Care Transfers,^{5,6} and other initiatives that have reduced the RTH rates from 23% to 8%,^{7,13} but unnecessary rehospitalizations continue to be common.^{8,9}

The most common diagnoses resulting in hospital readmissions include congestive heart failure, pneumonia, sepsis, and chronic obstructive pulmonary disease.¹⁰ This reflects our experience. However, patients' conditions are in fact much more complex. An example was a 78-year-old man admitted to the facility after falling and sustaining a hip fracture. The patient presented with a fever of 102°F (39°C), lethargy, and low oxygen saturation. He had a history of advanced parkinsonism and recurrent pneumonias and diabetes, and he was requesting aggressive life-sustaining interventions. The patient was seen and examined, conversations with nurses and the patient's family proceeded, and care was initiated with IV hydration and IV antibiotics (both started within 2 hours of visit) and included a discussion of advanced care directives. The patient was monitored closely with frequent vitals and follow-up. This patient was successfully treated on site and was designated as "do not resuscitate or hospitalize."

Telemedicine has been utilized in many settings over the past several decades, but there is limited evidence of it being applied to the care of SNF postacute patients. In a study by Grabowski and O'Malley, telemedicine was shown to be a promising intervention for SNF patients; however, the results were not statistically significant.¹¹ Embedding an after-hours coverage service enabled by telemedicine, such as the service provided by TC, to complement the daytime primary care practitioner presence in the SNF was shown to reduce rehospitalizations and has the potential to increase staff performance (data not reported here).¹² This intervention provided on-the-job training in physical assessment skills to the nurses.

We did not study the impact of our intervention over the following 7 days at this facility. However, this was studied in 2 unrelated (unpublished) populations wherein 85% to 92% of patients treated on site remained in the facility or went home over the following 7 days.

CONCLUSIONS

As nursing facilities are called upon to care for higher-acuity patients and drive better clinical outcomes at a fraction of the cost of a hospitalization, systems that deliver quality physicians to the bedside at times of change of condition will be required. This study found that use of a dedicated, virtual, after-hours physician coverage service in an SNF demonstrated a significant reduction in Medicare costs (acute inpatient hospital, subacute care, and transfer costs). These efforts present an opportunity to improve both clinical outcomes for older adults in need of long-term and postacute services and financial outcomes for those providing the care. Of note, the TC physicians were exclusively dedicated to providing care to our client facilities and were not providing medical care simultaneously in other settings (ie, working in the ED or rounding in the hospital).

This study demonstrated that the health plan (payer) is the major financial benefactor from this after-hours medical care program. Ninety-one prevented admissions resulted in \$1.55 million in savings over the course of 1 year in 1 nursing facility. Extrapolating these findings to 30% of America's 1.7 million nursing facility beds could produce actual savings for the Medicare program in excess of \$1.5 billion per year. Although the payer was significantly advantaged by preventing hospitalizations, the SNF also showed modest financial gains by helping to keep their rehabilitation beds filled (by preventing hospitalization and being a desirable referral source to their referring hospital systems and payers) (unpublished data). As the CMS 2% hospitalization penalty to the SNFs engages in 2018, the financial consequences of hospitalization will become even more marked.

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Although portions of this manuscript were part of a doctoral thesis, neither the full manuscript nor any component parts have been or will be submitted elsewhere for publication.