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Innovative Information Technology–Powered Population Health Care Management Improves Outcomes and Reduces Hospital Readmissions and Emergency Department Visits

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Background: Patients with chronic conditions are often the most frequent users of health care. Moreover, adapting to developments in one's illness, understanding how to self-manage a chronic illness, and sharing information between primary care and specialty providers, can be a full-time job for someone with a chronic illness. In response to these challenges, Christiana Care Health System (Wilmington, Delaware) developed Care Link, an information technology (IT)–enhanced care management support to enable populations of patients to achieve better clinical outcomes at lower cost.

Methods: In 2012 Christiana Care received a grant to design a generalizable, scalable, and replicable IT–driven care model that would integrate disparate clinical and registry data generated from routine care to support longitudinal care management for patients with ischemic heart disease. The single-disease care management program was expanded beginning in mid-2015 to serve risk-based models for many diseases and chronic conditions.

Results: More than 8,600 patients in several surgical and medical populations, including joint replacement, cervical spine surgery, and congestive heart failure, have been supported by Care Link. For example, preoperative assessment of patients with elective joint replacement to predict post-acute care needs led to an increase in the volume of patients discharged to home with self-care or with home health care by 30%—from 61% to 80%.

Conclusion: Care Link IT functions can be replicated to address the unique longitudinal care needs of any population. Care Link's next steps are to continue to increase the number of patients served throughout the region and to expand the scope of care management programming.

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From left to right: Donna Mahoney, Michele Campbell, Sharon Anderson, Tabassum Salam, Patty Resnik, Terri Steinberg.

The burden of chronic disease in the United States has long been recognized. For example, in 2012, among adults, approximately half (49.8%—117 million people) had at least 1 of the 10 following chronic conditions: hypertension, coronary heart disease, stroke, diabetes, cancer, arthritis, hepatitis, renal disease, asthma, chronic obstructive pulmonary disease.[1] Even more concerning, although 24.3% of adults had 1 chronic condition, 60 million adults had multiple conditions (13.8% had 2 conditions, and 11.7% had 3 or more conditions).[1] It has been shown in many populations that those with chronic conditions are the most frequent users of health care. One survey, for example, found that 76% of physician visits, 91% of all prescriptions filled, and 81% of all hospital admissions were for chronic disease[2]—and these inpatient stays contribute significantly to overall costs.[2,3]

Concurrent with the expansion of value-based payment models in health care, Medicare has progressively moved toward shifting larger portions of its overall payments through alternative models, having set a goal of at least 50% by the end of 2018. In addition, Medicare has linked value-oriented quality measures to fee-for-service payments.[4]

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As a leading care provider in Delaware, Christiana Care Health System has been deeply committed to addressing the health of its community in new and broader ways. In Delaware, as elsewhere, the impact of unaddressed complex chronic conditions manifests as too many emergency department (ED) visits for acute conditions that could have been managed at home or in the physician's office. Community services are vitally helpful when they are effectively made available to those who need them. Adapting to developments in one's illness, understanding how to self-manage a chronic illness, coordinating appointments, sharing information between primary care and specialty providers, and following up on details—from transportation to prescriptions to scheduling tests—can be a full-time job for someone with a chronic illness.

In response to these challenges, Christiana Care developed Care Link, a patient-centered and clinician-led information technology (IT)–enhanced care coordination service designed to fill gaps in the health care system and to get people the right care at the right time, in the right place, and with the right community resources. An innovative multidisciplinary program, Care Link is providing IT–enhanced care management support to enable populations of patients to achieve better clinical outcomes at lower cost.

METHODS

Setting

Christiana Care Health System is one of the largest health care systems in the United States, ranking as the 22nd leading hospital and 11th on the East Coast in terms of admissions. The health system includes The Medical Group of Christiana Care, a network of primary care physicians, medical specialists, and surgical specialists; as well as home health care, preventive medicine, rehabilitation services, and patient/family advisors for core health care services. A not-for-profit teaching hospital affiliated with Sidney Kimmel Medical College at Thomas Jefferson University (Philadelphia), Christiana Care is recognized as a regional center for excellence in cardiology, cancer, and women's health services. Christiana Care has an extensive range of outpatient services, and through Christiana Care Quality Partners, Christiana Care works closely with its medical staff to achieve better health, better access to care, and lower cost. Christiana Care is home to Delaware's only Level 1 trauma center, the highest-capability center and the only one of its kind between Philadelphia and Baltimore. Christiana Care features a Level 3 neonatal ICU, the only delivering hospital in Delaware that offers this highest level of care to the most critically ill newborns. Christiana Care includes two hospitals with 1,100 patient beds.

Development of Care Link

In 2012 the Center for Medicare and Medicaid Innovation (CMMI) selected Christiana Care from more than 3,000 applicants across the United States to receive a three-year award to develop and test new methods for care delivery. Christiana Care received a $10 million grant to design a generalizable, scalable, and replicable IT–driven care model that would integrate disparate clinical and registry data generated from routine care to support longitudinal care management for patients with ischemic heart disease.[5] The goal, in accordance with the Institute of Healthcare Improvement's Triple Aim,[6] was to achieve better health, better health care experiences, and lowered costs for patients with ischemic heart disease and provide a national model for how to activate data in a fragmented, multipayer health care environment. Concurrent with the growth of value-based payment models, the single-disease care management program was expanded beginning in mid-2015 to serve risk-based models for many diseases and chronic conditions.

In December 2012 Christiana Care launched the expanded, fully functioning care management team, which was composed of two health ambassadors, two RNs, two social workers, one clinical pharmacist, and a medical director—for patients with ischemic heart disease. The grant program's promise led us to begin planning its expansion to a sustainable program in mid-2014 and, following completion of the grant period, Christiana Care Link was launched in January 2015.

Command Central "Hub"

The Care Link hub is located in the Center for Virtual Health in downtown Wilmington, Delaware. The staff, except for those who are embedded in the practices, virtually manage the populations by using sophisticated software and hardware systems. This Care Link hub has two key functions—to provide (1) enhanced transitional care to ensure that the patient experience is seamless in the transition between inpatient and outpatient settings, and (2) longitudinal care management to address evidence-based secondary prevention goals.

Early in the development of Care Link, it became apparent that the methods and resources in place for ischemic heart disease would also be valuable in the management of other diseases and conditions. The ability of the technology platform to identify people at risk for events, or with clinical scenarios that require attention, in combination with a comprehensive care management program, was noted to be a powerful resource. Previously, "cookbook medicine" applied clinical scenarios to everyone with the same condition or disease. We realized that the technology-based care management tools could be used to customize the interventions on the basis of severity and other factors. Patients who might otherwise not seek medical attention are thereby "discovered" so that the right care is provided when needed.

The CMMI grant, fortified by a significant financial investment by Christiana Care Health System, established the foundation for a scalable, innovative IT platform that would enable the care management service essential to Care Link with an efficient staffing model. The use of a shared population health management electronic health record (EHR)