Proactive population health management within an HIE network

Population-oriented models of healthcare delivery are emerging to fill in the gaps left by conventional care models that reach only those people who are willing and able to visit a healthcare provider. Information technology, especially health information exchanges (HIEs), are critical to the success of these new models of care.

HIEs can enhance population health management by giving independent organizations within a hospital system, community, or region the ability to electronically move clinical data across disparate systems without changing the meaning of the data being moved. This resource for data aggregation makes it easier for clinicians to meet high standards of care because they can continue to participate electronically in their patients’ care regardless of where in the network those patients receive treatment. HIEs also reduce the expenses associated with duplicating tests, recovering missing patient information, and printing and delivering documents.

Furthermore, clinical decision support (CDS) systems—interactive computer programs that assist physicians and other health professionals with decision-making—can use HIE data to identify patient-specific care needs. They can also use the data to identify sentinel events (defined as patterns of excessive or inappropriate use of care services), missed appointments, or missing studies or tests relative to accepted standards of care, and then promote proactive interventions to address the identified needs.

Community-oriented approach to coordinated health

In 1999, David Lobach, MD, PhD, MS, associate professor in the Department of Community and Family Medicine, and his team initiated the development and implementation of a regional HIE called the Community-Oriented Approach to Coordinated Health, or COACH, to facilitate communication within the Northern Piedmont Community Care Network (NPCCN). NPCCN provides care management services for more than 40,000 Medicaid beneficiaries in Durham County and five neighboring counties in the northern Piedmont of North Carolina. This network includes 32 primary care practices, three federally qualified health centers, five community hospitals, nine government agencies, one academic medical center, and two care management teams.

Before COACH, health informatics researchers did not know if clinical, claims, and billing data could be used to identify sentinel events and thus promote proactive changes in preventive and therapeutic care. In a randomized controlled trial, Lobach’s team demonstrated that COACH can help clinicians detect the important care needs of the population who benefit from Medicaid in the northern Piedmont region and, as a result, lower costs and facilitate the more appropriate use of care services. In Durham County alone, COACH detected 7,226 sentinel health events in 2,285 unique individuals over a six-month period.

The researchers worked with medical directors and administrators of the primary care clinics and members of the care management teams within the NPCCN to define and prioritize these sentinel events, based on what issues were most
important to providers within the network. They eventually included patient behaviors such as excessive use of healthcare resources (e.g., three or more visits to the emergency department [ED] in 90 days), potentially avoidable use (such as visiting the ED for asthma), and those behaviors that could potentially be modified if healthcare providers intervened.

Maximizing health information exchange within the northern Piedmont

COACH collects administrative data (demographics and identifiers, services used, provider associations, audit trails); care management data (care management encounters, health risk and environment assessment, socioeconomic data, special needs, and care management plans); clinical data (encounters, problems, procedures, missed appointments, medications, allergies, laboratory results, disease-specific care plans); and communication information (messages and alerts, referrals, notices of new information). Basic demographic and eligibility data for network enrollees are uploaded to the system from the North Carolina Office of Rural Health and Community Care on a monthly basis, and data transfer protocols are used to import clinical and billing data from partner sites.

Lobach’s team built COACH on a Web-based platform, and used a central Microsoft SQL Server database to store the data it gathers. To expand the use of COACH beyond Medicaid patients, they also partitioned COACH to manage patient records for specific programs, giving users access only to the data in their programs.

An enterprise master patient index (EMPI) within the COACH system matches data from multiple sites for a single patient. The EMPI is a registry containing all the available medical record numbers and program enrollment numbers, such as Medicaid IDs, for a given person. Data coming from a partner site must match one of these numbers to be added to a patient’s record in COACH, which uses XML-based data transfer protocols to import data from provider organizations. The imported data include encounter and pharmacy claims data from the State Medicaid Office, as well as billing data from 15 clinics and five hospitals in the six-county region.

Incorporating standards-based decision support

The COACH HIE network has since been adapted to use a standards-based decision support service known as SEBASTIAN, or System for Evidence-Based Advice through Simultaneous Transaction with an Intelligent Agent across a Network (see page 28).

SEBASTIAN is currently being used to support population health management in the COACH HIE network. In conjunction with SEBASTIAN and the NPCCN’s care management program, COACH has reduced low-severity ED visits and significantly reduced expenses for Medicaid beneficiaries under the age of 18—who constitute 70 percent of Medicaid beneficiaries in the Community Care Program of North Carolina—leading to more than $6 million in cost savings.