As healthcare providers face downward cost pressures and increased contractual risk, they’re rapidly working to decrease utilization and provide truly appropriate treatments. At the same time, however, an industry-wide focus on wellness, disease management and preventative medicine is creating increasingly complex patient scenarios with multiple episodes of care. To coordinate encounters and improve community-wide outcomes, healthcare organizations are shifting from the traditional episode management model of care delivery to population health management (PHM). By managing chronic conditions and predicting tomorrow’s high utilizers, they hope to more cost-effectively deliver the right care, in the optimal settings and with the appropriate resources.

These goals present a unique set of healthcare information technology (HIT) challenges. Data from providers and payers must be consolidated and normalized for use across multiple enterprises; information must be made accessible to healthcare organizations in real time; and patients and clinicians must receive timely notifications before they can adjust care. While electronic medical records (EMRs), aggregators and other individual software applications allow for data collection at the enterprise level, few facilitate the real-time analysis and treatment of entire patient populations. To achieve effective PHM, healthcare organizations need to implement strategic informatics platforms that connect disparate applications and enable real-time analytics.

The state of population health management

In a HIMSS Industry Solutions and Healthcare IT News webinar, Peter Kilbridge, MD, Senior Director of Research and Insights at the Advisory Board Company, and P. Nelson Le, MD, HealthShare Senior Advisor at InterSystems Corporation, discuss the current state of population management and outline the IT framework necessary for effective PHM implementation. “We’re turning traditional medicine and healthcare on its head,” said Kilbridge. “Instead of focusing on maximizing volume to generate revenues, we’re focusing now on providing less but better and more appropriate care.”

This shift towards more appropriate and accountable care has become critical for nearly every healthcare organization in the country. Most providers are at least at risk for their own employees, some care for large numbers of uninsured patients and others still are treating Medicare Shared Savings and Medicare Advantage participants. With growing numbers of commercially insured, self-funded and insurance exchange patients, they’re all going to take on even more risk in the long run.

Not surprisingly, growing contractual risk is driving massive changes in reimbursements and care delivery methods. “As we move from fee-for-service and acute-care management towards risk-sharing payment models,” noted Kilbridge, “the economic incentives for our organizations shift, and with them the metrics of quality, including increasing emphasis on preventive care and different levers for driving performance.” A Healthcare Advisory Board survey likewise indicates that most health systems are investing massively in care management programs, analytics, population segmentation and other aspects of PHM. As they phase out of the fee-for-service model, today’s healthcare organizations can only remain profitable by predicting, tracking and proactively treating their highest-risk patients.

As hospitals and health systems shift toward risk management – and as they continue to merge into accountable care organizations (ACOs) and other conglomerates – they will need to rethink and reshape their IT infrastructures. “It’s only with a systematic overview of PHM that organizations can begin to plan the wisest programmatic and infrastructural investments, including information technology,” said Kilbridge.

A framework for IT-enabled population management

According to Kilbridge, IT-enabled PHM can be broken down into four key activities. First, healthcare organizations must identify and segment at-risk populations into three categories: current high utilizers, future high-risk patients and those who already suffer from chronic diseases. Accurate and timely segmentation requires both claims and clinical data, and most organizations will need to combine information from multiple enterprises. Because of the enormous turnover in high utilizers, identification and segmentation also necessitate predictive analytics. Studies have shown that up to 70 percent of the top 5 percent of Medicare utilizers turn over from year to year, and as Kilbridge noted, “If 70 percent of these patients are not on our radar today, we need to use predictive analytics to find them today, so that we can intervene and avoid the costs they represent.”

Second, providers must map and track care for their chronic disease patients, ensuring effective treatments and pinpointing problem areas. Central to this task is the disease management registry, which may or may not reside within an organization’s existing EMR. While EMR-based registries work well for integrating clinical data, other products are often necessary for incorporating patients and data from outside organizations.

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– Peter Kilbridge, MD
Senior Director of Research and Insights
The Advisory Board Company

This report is based on a HIMSS Industry Solutions & Healthcare IT News webinar presented by InterSystems Corporation in July 2013.
Third, healthcare organizations should deliver care through a patient-centered medical home (PCMH). PCMHs are typically primary-care centered, and they use a team-based approach to complement primary care physicians’ (PCPs) recommendations with advanced practitioners, pharmacists, social workers and other specialists. Core IT capabilities include patient portals, registries, health information exchanges (HIEs) and EMRs, although home health self-monitoring devices may also allow for frequent data collection and real-time patient-clinician communication.

Fourth and finally, healthcare organizations must use care management systems to coordinate workflows across each PCMH. The major functionalities of effective care management systems include:

- A multidisciplinary care plan visible to all members of the care team
- Importation of providers’ directory files
- The creation of work lists and patient calendars
- Patient outreach capabilities
- Real-time notifications of admissions and discharges

All four of these elements depend heavily upon two foundational capabilities: patient engagement and the monitoring, analysis and reporting of PHM activities. Common technologies such as portals, text messaging, e-mail and even social networking allow for effective patient engagement across the care continuum. As Kilbridge noted, however, “The ability to monitor and report on the activities of population management is essential, but it’s a function and not a system.” To help healthcare organizations fully achieve that function and realize their PHM goals, Le used three case studies to show how strategic informatics platforms can address the challenges of data consolidation, real-time data access and rapid interventions.

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— Peter Kilbridge, MD

### Leveraging strategic interoperability for data aggregation and normalization

Effective PHM necessitates more than the simple consolidation of disparate data sources; it requires that a variety of data types be normalized and aggregated into a cohesive care record. “As our patients get more complex and act through multiple points of care and multiple providers,” said Le, “we need to be able to aggregate those records so that everyone gets the most accurate and current data.” As Le pointed out, however, traditional forms of interfacing simply synchronize applications and move data from one point to another. Users still have to contend with non-standard fields and forms, and they’re left to make sense of the data on their own.

A better approach is strategic interoperability: the aggregation of data into truly useable information. An interoperable platform can combine lab data and other values from multiple providers, different physical locations and a variety of EMRs into a single timeline for a patient or population. These timelines can also incorporate logic to ensure the right information gets to the correction clinicians at specific times.

A perfect example of interoperability in action is the high-risk obstetrics population at North Shore Long Island Jewish (NSLUJ) Health System. These patients typically undergo multiple encounters, including prenatal, imaging, labor and delivery, inpatient postnatal and post-partum care. These encounters take place across several hospital floors, clinics and imaging centers, and clinicians use three different EMRs to document treatments. The lack of connection between these EMRs was creating frequent gaps in data flow, and affecting the efficiency of care.

NSLUJ implemented InterSystems Healthshare, a strategic informatics platform, to create an aggregate patient record and facilitate more efficient, better-informed care. Now, prenatal documentation from each EMR is automatically pushed to a central hub after each visit. Admission for delivery then triggers that information to auto-populate the EMR at the inpatient hospital. Finally, patient discharge causes a summary and all relevant documentation to be sent to an outpatient facility and back to the central hub. Data flows smoothly from one patient encounter to the next, and all members of the care team can access the information they need.

### Accessing real-time data with active analytics

In order for healthcare organizations to effect real change in their high-risk populations, they also need to be able to access and analyze this aggregated data in real time, altering care from one patient encounter to the next. Unfortunately, traditional business intelligence (BI) tools provide only periodic data extracts and after-the-fact reports, and they only account for quantitative data.

On the other hand, HealthShare active analytics provide continuous access to current and constantly updated data, including from unstructured messages (such as doctors’ notes) and other qualititative, content-rich information. Just as importantly, active analytics platforms allow for real-time data access within native workflows, enabling clinicians to alter care quickly and efficiently.
The Rhode Island Quality Institute (RIQI), a nonprofit tasked with the development of a statewide health information exchange (HIE), recently implemented HealthShare active analytics to better manage the state’s Type II Diabetic population. All patient encounters, including admissions, discharges, prescriptions and lab results are now instantly served up to their analytics algorithms, which can then populate risk modeling dashboards in real time. These dashboards display patient-specific and population-wide information on hemoglobin a1c, blood pressure, LDL and a variety of other diabetes risk factors. The RIQI can now use these dashboards to monitor its populations, assess individual physicians and ultimately alter care for its highest-risk patients.

**Improving outcomes through automated interventions**

Finally, efficient PHM requires the automation of a variety of intervention tasks. Event notifications, predictive modeling and point-of-care interventions can be done manually, but they require the repeated and unsustainable application of time and labor. For clinicians to effectively alter care without expending extra resources, they need the automatic coordination of entire care teams.

MemorialCare, a six-hospital health system in Orange County, California, is using HealthShare’s notification features to achieve such coordination by automatically alerting clinicians within their native workflows. Whenever a patient is admitted, discharged or transferred, MemorialCare’s inpatient EMR sends a Health Level 7 (HL7) message to HealthShare’s provider directory, which determines that patient’s attribution and notifies the correct clinicians via their own EMRs. Without any additional input from physicians, hospital staff or other care team members, these clinicians can then alter care accordingly.

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— P. Nelson Le, MD
HealthShare Senior Advisor
InterSystems Corporation

**Improving population management through next wave IT investments**

As healthcare organizations shift towards the population management model of care delivery, simply storing aggregated data will no longer be sufficient. Robust PHM requires providers to convert claims-based and clinical data into information that can be used to identify high-risk populations and quickly intervene in their care. Since most organizations use combinations of third-party and in-house applications to document patient encounters, they will need to invest in new IT infrastructures to connect disparate data sources and enable real-time analytics. As Le concluded, “Strategic interoperability is the foundation for aggregating and normalizing this data, and without presenting data in a way that’s meaningful, the goals of population health management are difficult to achieve.”

***About InterSystems***

InterSystems Corporation is a global leader in software for connected care, with headquarters in Cambridge, Massachusetts, and offices in 25 countries. InterSystems CACHÉ® is the world’s most widely used database system in clinical applications. InterSystems Ensemble® is a platform for rapid integration and the development of connectable applications. InterSystems HealthShare™ is a strategic healthcare informatics platform for information exchange and analytics within a hospital network, and across a community, region or nation. HealthShare leverages InterSystems iKnow and DeepSee technologies to unlock all patient information, including unstructured data, and to enable real-time analysis.

InterSystems’ products are used by thousands of hospitals and laboratories worldwide, including all of the top ten hospitals on the Honor Roll of America’s Best Hospitals as rated by U.S. News and World Report.

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