Executive Summary

Proponents of accountable care organizations (ACOs) – consortia of hospitals and physicians that take responsibility for the cost and quality of care – assert that ACOs have the potential to improve patient health while reducing the waste in the healthcare system. But, for the fledgling ACOs to gain traction and begin to achieve that potential, they must build a new kind of technological infrastructure and fundamentally change the way that care is delivered.

The optimal ACO infrastructure should be designed to accommodate:

- Consumption of data across disparate clinical and administrative applications and data sources
- Health information exchange across the ACO, regardless of each participant’s stage of technology adoption
- Core components of an interoperable data exchange, including a Master Patient Index (MPI), a Record Locator Service (RLS), and a patient registry
- Automation tools that provide population health management data and alerts
- Analytics to make data actionable and to evaluate and improve organizational performance

This paper explores the ACO IT infrastructure and shows how it is designed to help ACOs achieve their goals.
The Evolution of ACOs

The seeds of ACOs lie in the ongoing escalation of health costs that has made it increasingly difficult for individuals, employers, and the state and federal governments to pay for healthcare. In grappling with this crisis, experts and policy makers sought to formulate a new approach to healthcare financing and delivery that would address the issues of rapid cost growth, poor access to care, and the suboptimal quality of care in the U.S.

These experts, including Elliott Fisher of Dartmouth Medical School and Mark McClellan of the Brookings Institution, devised a variation on conventional managed care that they called the accountable care organization. Originally based on a hospital and its medical staff, the ACO concept was later expanded to include physician groups, independent practice associations (IPAs), and other kinds of healthcare organizations.1-2

The Patient Protection and Affordable Care Act (PPACA) of 2010 authorized the Centers for Medicare and Medicaid Services (CMS) to create a shared savings program for ACOs. CMS, which launched that program in January 2012, defines an ACO as an organization that takes responsibility for the “quality, cost and overall care” of the Medicare beneficiaries assigned to it. A hospital, a physician organization, a hospital-physician partnership, and certain other healthcare entities can participate in an ACO, but it must include primary care physicians. The ACO also has to coordinate care across the continuum of care settings, measure its performance, and submit quality data to CMS. If the ACO helps reduce Medicare costs below expected levels and meets quality benchmarks, it is eligible to receive a share of the savings.3

As of July 1 2012, CMS had accepted 153 organizations into this program. This number includes the 32 “Pioneer” ACOs selected last December to test other payment methodologies, including partial prepayment for patient care.4

Meanwhile, many private insurance companies have begun contracting with ACOs to extend the model to non-Medicare patients. Blue Cross Blue Shield of Massachusetts, for example, preps ACOs for patient care and also offers quality incentives.5 Blue Shield of California has risk-sharing contracts with several ACOs consisting of physician groups and hospital systems.6 Other health plans are contracting with ACOs on a shared savings basis or are providing various incentives and care management fees for meeting cost and quality targets.8 Some payers are assisting ACOs by supplying health IT tools, claims data, and even care managers.9

ACOs differ from health maintenance organizations (HMOs) in several ways. They are created by providers rather than insurers, are required to meet robust quality goals to ensure they don’t skimp on care, and don’t restrict patients’ access to providers outside of their networks.10

Population Health Management

As ACOs assume greater financial risk, they will have to become skilled at “population health management.” Designed to maintain and improve the health of a patient population, this systematic approach to care delivery can reduce the number of avoidable emergency department (ED) visits, hospitalizations, surgical procedures, and other costly interventions. The population health model changes providers’ financial incentives. Instead of furnishing more services to increase revenues, as they do under fee for service, physicians and hospitals must increase their efficiency and make optimal use of their resources within a budget.

The current model of U.S. healthcare focuses on acute care. In contrast, population health management seeks to keep patients as healthy as possible and prevent exacerbations of chronic conditions, which account for about 75% of healthcare costs.11 This requires ACOs to emphasize continuous care of all patients, both during and between office visits and other contacts with the healthcare system. The ACO must help healthy patients stay well and proactively intervene with people who are in the early or more advanced stages of chronic illnesses.

The Care Continuum Alliance, a group of stakeholders that promotes wellness and disease management, says that population health improvement must include three components:

• Giving primary care physicians the central role in care delivery
• Motivating patients to take personal responsibility for their own care
• Coordinating care through wellness, disease and chronic care management programs12

What this will require, above all, is highly coordinated, patient-centric care and patient engagement. Key components of the population health management approach include, among others, care teams led by physicians and care managers who work with chronically ill patients. They need automated methods of enlisting patients’ cooperation, educating them about their condition, and increasing their compliance with doctors’ care plans.

None of this is possible without the use of health information technology to monitor patients and automate the routine tasks of care management. Manual methods of identifying care gaps and reaching out to patients who need chronic and preventive care services are labor intensive and too expensive for most physician practices. Even large organizations find that it is prohibitively costly to hire enough care managers to monitor and intervene with sick patients. Technology holds the key to managing patient populations cost-effectively.
Key ACO Technologies
For ACOs to perform population health management effectively, their IT infrastructure must include several core components. Among these are:

- Patient registries fed by clinical and administrative data from a variety of sources in near real time
- Care management automation tools that help care teams provide appropriate kinds of support to all patients on a continuous basis
- Care collaboration using health information exchanges (HIEs) and other methods to improve care coordination
- Patient engagement modalities that get patients more involved in their own care and help them manage their conditions
- Analytic tools that can be applied to databases to help ACOs evaluate, improve, and report on their organizational performance

Patient Registries
Patient registries keep track of what has been done for patients and what services they need. ACOs use registries for health risk stratification, care gap identification, quality reporting, and other purposes. An essential tool for automating population health management, these registries can be used for patient monitoring, patient outreach, point-of-care reminders, and care management.

A registry can be broken down by patient age, gender, health condition, health risk category, lab values within certain ranges, or other parameters. It can be used to generate reports on subpopulations, such as out-of-control diabetic patients, or to supply care alerts about particular patients to providers and care managers. When clinical protocols are applied to registry data, they can trigger automated text, email or phone messages to patients who need preventive or chronic care services.

Most electronic health records (EHRs) don’t have comprehensive registries or analytic capabilities, so providers must generally acquire third-party applications to do population health management. The registries must be interfaced with practice management (PM) systems that automatically populate them with patient demographic data. PM systems may also feed billing codes into registries; alternatively, registries can accept clinical data from EHRs. In either case, registries are invaluable for care management and outreach.

But EHR data, including lab values, supplies richer information for registry reports and allows providers to tailor alerts more specifically to patient needs. For example, a physician group might use a protocol that says a patient with diabetes should be seen for follow-up every six months. If a registry were based purely on administrative data, an automated outreach system would call back all patients with diabetes every six months. But if a patient had an HbA1c of 9 or above and was obese, his or her physician might want that patient to return every three months. Similarly, if a diabetic patient had high LDL cholesterol, his or her provider might need to set the LDL target at a lower level than for patients who did not have diabetes. Feeding EHR data into the registry of an effective care collaboration platform and HIE platform allows providers to customize those alerts and reminders.

Care Management Automation Tools
Care management spans preventive care, wellness activities, chronic disease management, care coordination, and transitions of care. It starts with registry data on which services have been provided to patients and when they’re due for preventive or chronic care. When clinical protocols are applied to this data, the information becomes actionable. For instance, a robust care collaboration platform can identify care gaps and generate care plans that providers can print out for patients during office visits.

Care managers who work with high-risk patients also receive registry reports on care gaps so they can prioritize their cases. Organizations with experience in managing population health have found that about 3% of patients require intensive support from care managers. This may take the form of telephonic case management and/or feedback from home-based or mobile monitoring devices.

Patients who have lower-level conditions receive automated alerts to make appointments when they need preventive or chronic care. They also are invited to use interactive online educational materials. Healthy patients may also be referred to online content about wellness activities and good health behavior.

A robust technology solution – encompassing both clinical messaging and the ability to view up-to-date, integrated patient records – enables each member of the care team to be aware of all aspects of the patient’s care. For example, every team member can know when a patient goes to the ED, is admitted to the hospital, is referred to a specialist, picks up a prescription medication, or has an exacerbation of their illness at home.

While physicians have long performed care collaboration, this kind of electronic communication greatly expands their ability to coordinate care and to be aware of changes in their patients’ health conditions. This increased flow of timely data results in better-informed medical decisions and, ultimately, better care for patients.

Care Collaboration Using HIEs
Across most of the U.S. today, electronic HIEs are still in a nascent stage. Enterprise-wide HIEs, such as those that link a hospital with its physicians, are growing faster than regional or statewide HIEs. ACOs need the latter as well as the former, because private HIEs contain only a portion of the data required for population health management.

Whether information is exchanged through private or public networks, HIEs are vital to connecting an ACO’s providers to each other and to providers outside the organization. Every physician, hospital and ancillary provider that touches a patient should be able to access all of the available health information on that patient, preferably in a single view.

Key IT components for care collaboration.
HI-ES can be far more than conduits for exchanging data. They can also be care collaboration platforms that help providers coordinate care and work with patients to improve compliance and self-management. AT&T Healthcare Community Online, for example, is specifically designed as a care collaboration platform. Besides a HIE, it also encompasses longitudinal, multi-source patient records, registries, analytic tools, visit planners, patient outreach modalities, and the ability to integrate mobile and telehealth data. While these features are layered on top of the solution’s information exchange capabilities, ACOs can acquire many of these modular components and interface them with whatever HIE solution they’re already using.

**Patient Engagement Modalities**

Population health management, as mentioned earlier, requires that patients be engaged in their own care. Unfortunately, most of them will not do this on their own, so they need reminders and education about their health conditions and lifestyle factors to become activated. When patients do so, studies show, their health outcomes improve.17 For ACOs, that means huge savings on preventable ED visits, admissions, and complications.

Among today’s top patient engagement tools are these:

- Health risk assessments
- Interactive patient education materials
- Digital coaching
- Patient portals
- Telehealth
- Home monitoring
- Mobile health apps

Patients may be asked to fill out online health risk assessments to track changes in their health status and to educate them about appropriate self-care. Online education materials and digital coaching can also be used to build patient engagement. The involvement of physicians increases the likelihood that their patients will use these online resources to improve their health.

Patient web portals, often used for appointment scheduling, prescription refill requests and bill payments, can also play a key role in non-visit care. For example, providers can use portals to deliver lab results and visit summaries to patients; they can do online consultations with patients on health issues not serious enough to require office visits; and they can provide links to educational and social networking websites that might benefit particular patients.

In addition, personal health records (PHRs) on portals allow patients to keep track of their own health and to enter data that they might want to share with their physicians. They can also share their PHRs with family members and caregivers.

Home monitoring tools, such as mobile health applications (mHealth), are coming to the fore as more and more healthcare organizations try to keep their patients healthy and out of the hospital. While consumers are primarily using mHealth apps for wellness and fitness, some of these programs are designed for people with such chronic conditions as diabetes and hypertension. The ability to integrate data feeds from mobile devices into a longitudinal record helps care teams keep tabs on these patients.

**Analytic Tools**

To achieve their cost and quality goals, ACOs must use analytic and business intelligence applications to manage population health, measure their organizational performance, report quality data to government agencies and private payers, and monitor the cost of care so they can remain within their budgets or hit their shared-savings targets. Analytic tools for ACOs require these core competencies:

- **Risk stratification.** ACOs must be able to classify patients by their chances of getting sick or sicker. In an average population, only 30% of the patients who are considered high risk today were in that category a year ago. Therefore, to optimize health and control costs, ACOs must try to predict which people are likely to need care in the future so that providers can intervene to modify their risk factors.

Sophisticated analytic programs are required to do this risk stratification and to identify patients who need help, such as at-risk or chronically ill, in order to determine where interventions would be most effective. These analytic reports can generate actionable alerts to providers and care managers and can help ACO managers evaluate performance gaps by condition, site, provider, and other parameters.

- **Performance assessment.** Reports on subpopulations of patients can help ACO management evaluate how well the organization is performing care processes, such as helping to ensure that patients with diabetes receive HbA1c tests and eye exams at particular intervals. While long-term outcomes are still hard to measure, managers can see data on intermediate outcomes such as HbA1c levels, LDL cholesterol values, and blood pressure. Together, these process and outcomes metrics form the basis of the quality information that ACOs must report to CMS and private payers. They also show where population care gaps are so they can be remedied.

- **Population health management dashboard.** ACOs need a configurable dashboard that allows managers to track the performance of individual providers, care sites, quality improvement initiatives, and the organization as a whole. This performance data includes not only quality indicators but also shows how resource utilization varies across the ACO.

- **Financial reporting.** ACOs must be able to do financial reporting of a very different kind than what most healthcare organizations are accustomed to. Since ACOs aim to bend the cost curve while improving quality, they need analytics to compare their cost trends to industry benchmarks; measure their enrollment changes; monitor average costs per member; compare costs by site; and break down costs by condition, by care setting, or by acute, chronic, and preventive care.

**Data Access Challenges**

The two great IT challenges facing ACOs are the digitization of health information and the ability of providers to exchange that information with each other and with patients. Although the government’s meaningful use incentive program is accelerating EHR adoption, ACOs will have to contend with paper, fax, and other unstructured means of exchanging data for the foreseeable future. Interoperability among information systems is an evolutionary process, with some entities within ACOs moving at a different pace than the rest. For example, the portion of hospitals sharing data with outside entities in early 2012 was about 19%, according to the Office of the National Coordinator of Health IT.18
Paper is still ubiquitous in healthcare, so an ACO must be able to facilitate the electronic storage and exchange of unstructured documents. These documents, which include patient encounter notes, lab results, consultant reports, hospital reports, and discharge summaries, can be scanned into an EHR or document management system. Once they are in the system, they can be computer faxed to other providers, or they can be viewed on a portal.

Various data formats an ACO must contend with consuming.

Population health management, however, depends on the structured clinical data in EHRs. When information is trapped in paper documents or electronic free text, it cannot be used for stratifying populations, populating registries, tracking and alerting patients, or reporting quality data. Care management and disease management are possible but very difficult to do without structured clinical data.

From an ACO viewpoint, current EHRs have some drawbacks. Initially designed to maximize reimbursement, rather than for quality improvement or population health management, EHRs typically focus on individual encounters; they have only a partial ability to generate the kind of reports and actionable data needed for care management and care coordination. While leading EHRs contain some health maintenance alerts, they’re generally hard to customize.

Equally important, EHRs require interfaces to exchange data fully with other EHRs. While the leading systems can exchange clinical summaries, ACOs need more data than that for care collaboration and care management. So while EHRs are essential, health information exchanges are a critical piece of the ACO IT infrastructure.

Components of ACO Communications
The health information exchanges described earlier do not spring into being overnight. Healthcare organizations, communities, and states are slowly developing these private and public HIEs, and their evolution mirrors the readiness of the providers who participate in them. What follows is an explanation of the kinds of connectivity that ACOs must build to be successful.

Modes of Data Exchange
The ACO IT infrastructure must be able to accommodate both “push” messaging and “pull” or query transactions and be able to access both types of transactions across all data sources.

In a typical push transaction, a primary care physician sends a message with an attachment, such as visit notes, to a specialist, or the specialist sends a report back to the referring doctor. This kind of point-to-point communication may employ any of several proprietary messaging systems, including the Direct Project protocol for secure messaging that many HIEs now use. (The Direct Project, developed by a public-private consortium, is a standardized messaging protocol that allows the secure exchange of data among providers and between providers and patients.)

Another example of push communication is the routing of hospital reports and lab results to staff physicians, where the HIE acts as a hub that pushes messages containing the data to and from secure e-mail inboxes.

ACO providers must also be able to pull or query distributed patient records, especially in emergencies or when a new patient presents to them. The ACO IT infrastructure provides that kind of access by building a central data repository or by using a federated model that allows view-only access to patient data distributed across various providers. A third, hybrid model provides a single, federated view of patient information in data warehouses maintained by healthcare organizations.

Whatever methods an ACO provides to allow for searchable access to data, the platform it uses must include a master patient index that uniquely identifies each patient in its database. It must also use a record locator service that pulls all requested data from wherever it resides. And to be valuable to providers at the point of care, it must provide a single view of patient data, whatever the source. That means the HIE must enable “any-to-any” messaging and integrate a variety of message types from different provider and payer systems, including HL7 and ASC X-12 messages and Continuity of Care Documents (CCDs).

Provider organizations are increasingly using the CCD standard to exchange clinical summaries among users of disparate EHRs. A care collaboration and HIE platform can aggregate these CCDs into a single patient summary that providers may access either on a web portal or in a connected EHR.

An ACO should also have a mechanism that allows providers with disparate EHRs to exchange structured data at a deeper level. For example, comprehensive data from seven leading ambulatory EHRs and three inpatient systems is viewable in AT&T Healthcare Community Online, which also connects with about 300 practice management systems.

Intra-HIE Data Exchange Methods
In areas where public HIEs don’t exist or don’t encompass all entities contributing to a patient’s care, it is possible to use the Nationwide Health Information Network (NwHIN) to exchange information among the multiple provider organizations in an ACO. About 500 hospitals and 3,000 providers are already connected to the NwHIN, and the Department of Veterans Affairs is testing the ability of NwHIN Connect to exchange data among VA and military hospitals and private providers.

Ideally, a care collaboration platform should also integrate data from medical imaging, telehealth and mHealth solutions so that care teams can view the images and other information in these databases at the point of care. In addition, analytics programs can be applied to the telehealth data, allowing that information to be used proactively in care management.
Data Sources
The limiting factor of any ACO’s IT infrastructure is the range of data available to it. Most EHRs contain only information about the care that patients have received from a single physician practice, hospital, or health system. HIEs and enterprise data warehouses contain a broader range of information that can be uploaded to a registry. But even a community HIE only has data on the care provided to a patient in the local area. So ACOs should consider using health plan claims data, especially if they are collaborating with payers. ACOs participating in the CMS shared-savings program will also need Medicare claims information.

While claims data is not as up-to-date as clinical data, it shows almost every healthcare service provided to a patient anywhere. If a patient filled a prescription while travelling on vacation, it will show up in the claims database. So this information, which can be combined with clinical data, is an important resource for population health management. Claims can also show “leakage” of patients to non-ACO providers – something that ACOs must track if they’re taking financial risk.

Conclusion
ACOs cannot function without a robust health IT infrastructure. To curb unnecessary redundancy while improving the quality of care, they need a holistic, patient-centric view from all care providers. And, since they typically include multiple business entities, they require a health information exchange that facilitates the aggregation of data generated by disparate EHRs and information systems.

This HIE must be more than a conduit for passing data back and forth. It must be a care collaboration platform that allows care teams to coordinate and manage each patient’s care on a continuous basis. Care teams must have access to a shareable record that provides a single view of everything that has been done for a patient. All of that data must be fed into a comprehensive registry of the patient population so that care gaps can be identified and interventions can be undertaken. ACOs require other care management and patient engagement tools for population health management, and they must apply analytics programs to stratify their patients by health risk. Finally, they must have business intelligence software that can measure their performance on quality and financial indices and keep track of their efforts. By unleashing technology to enable this, the healthcare industry can begin to create a more collaborative and healthier system for all.

AT&T has embraced the spirit of innovation and collaboration, prescribed as the remedy for enabling healthcare to improve care quality and reduce costs, with its AT&T ForHealth™ practice area. The company is focused on accelerating the delivery of innovative wireless, cloud-based and networking services and applications that have direct and immediate impact on care outcomes.

AT&T ForHealth is developing and delivering advanced IT solutions in five areas: care collaboration platform and health information exchange; cloud-based medical imaging; mHealth; remote patient monitoring; and telehealth. The company is utilizing its network, scale and technological expertise to collaborate with the healthcare industry to address and solve its challenges.

Notes
1. Elliott S. Fisher, Douglas O. Staiger, Julie P.W. Bynum and Daniel J. Gottlieb Creating Accountable Care Organizations: The Extended Hospital Medical Staff Health Affairs, 26, no.1 (2007):w44-w57
5. HHS Announces 88 New Accountable Care Organizations, accessed at: http://www.cms.gov/apps/media/press/release.asp?Counter=4404 &intNumPerPage=10&checkDate=&checkKey=&srchType=1&numDays=3500&srcOpt=0&srcData=&keyworpType=All&chekNewsType=1%2C+2%2C+3%2C+4%2C+5&intPage=&showAll=&pYear=&year=&desc=&cbOrder=date


18. Duncan, Health Risk Adjustment.


For more information visit www.att.com/healthcare.