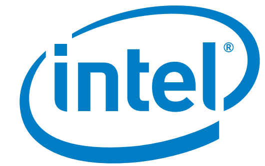
WHITE PAPER
Accountable Care Organizations
Healthcare



Accountable Care Organizations and Beyond: IT Strategies for 21st Century Healthcare

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INTRODUCTION: TOWARD AN ARCHITECTURE FOR NEXT-GENERATION CARE DELIVERY

As global populations age and the prevalence of chronic disease rises, it's increasingly clear that we can't deliver higher-quality, more affordable healthcare without aligning payment incentives and improving coordination across the many providers who care for a given patient. This clarity helped lead to the specification of Accountable Care Organizations (ACOs) in healthcare reform legislation passed by the U.S. Congress in 2010 called the Patient Protection and Affordability Care Act.

ACOs are a U.S. phenomenon whose specifics, as of this writing, are still being developed. Beyond partisan politics and program details, however, the trends driving the establishment of ACOs are universal, and the importance of care coordination and payment reform are widely recognized. ACOs share goals and approaches with projects and pilots around the world, including GP commissioning in the U.K., networks of Medicare Locals for primary care in Australia, and new payment paradigms in China for rural healthcare delivery. All reflect the need to care for larger populations of sicker patients with fewer providers; all are driving toward a new paradigm of 21st-century healthcare based on integrated, personalized, distributed, and coordinated care delivery.

ACOs and other alternate care delivery approaches depend for their success on secure, shared access to comprehensive, timely, accurate clinical information. As such, they require ministries of health, healthcare systems, and other organizations to architect and design new information infrastructure that can deliver the right data to the right stakeholders in ways that improve clinical outcomes and lower the cost of care.

For more than a decade, Intel has worked with healthcare leaders around the world to design and deploy robust healthcare IT (HIT) solutions, and we continue to do so. Our information architects, clinicians, and social scientists are on the ground in dozens of countries collaborating to help healthcare organizations develop sustainable ACO business models, identify needed workflow changes, and architect information infrastructure for optimal care and efficiency. This paper outlines key concepts and capabilities we see as important to the discussion of ACOs and other efforts at coordinated patient care and payment reform. We expect this to be the first in a series of papers that will lead to a more detailed architectural blueprint for next-generation care delivery.

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Accountable Care Models

While there are many models and variations, an ACO is essentially a group of hospitals, physicians, and other providers responsible for the quality and costs annually of a large group of patients in a particular geographic area. While ACOs are currently a proposed Medicare-payment model in the U.S., many private market payors, physician groups, and other healthcare entities around the world are preparing to form ACOs and ACO-like organizations in anticipation of inevitable market changes.

Like other alternative approaches to care delivery and compensation, ACOs organize and coordinate the end-to-end delivery of services for each participant across the care continuum from hospital to home. ACOs and other alternative models of care delivery are generally focused on providing care in the lowest-cost settings appropriate to the patient's or citizen's needs. In addition to providing coordinated care, ACOs will be expected to promote evidence-based medicine and patient engagement and to report on quality and cost measures. ACOs may participate in shared savings programs that reward them for reducing costs and achieving quality-of-care goals.

Table 1 summarizes some of the changes that are embodied in the transition to ACOs and similar models of care.

ACOs are a U.S. phenomenon, but have much in common with initiatives around the world. All are driven by inexorable demographic and cost trends. All envision a world of integrated, personalized, distributed, and coordinated care delivery.

Table 1. Shifting to Accountable Care Models

Today	Tomorrow
Volume driven	Value driven
Fee for service	Fee for results
Provider paid per visit, test or other service	Provider paid per patient annually
Provider paid only for on-site services	Provider can be paid for virtual or home visits
Provider acts alone	Provider is paid as part of a care team
No required measurement of quality	Quality must be measured, with bonuses for achieving identified targets
No incentive for preventive care	Huge incentives for preventive care

Four Global Trends

ACOs and other integrated care delivery (ICD) efforts are shaped by four global trends or requirements, and any information architecture must address these trends. We call them the four Cs.

1. **Complexity**. Healthcare systems are being asked to manage an increasingly complex environment that encompasses patients with more complex illnesses and more comorbidities; more complex data types and information streams flowing through electronic health records (EHRs) as the revolutions in genomics and phenomics are incorporated into clinical care; and more complex care management challenges because of all the players and specialties involved in care.
2. **Coordination.** To support the move to team-based models of care, healthcare systems must accommodate the information and workflow requirements of the many stakeholders and organizations involved directly or indirectly in patient care.
3. **Collective payment or collective responsibility.** Alternate payment schemes will become more prevalent, pushing groups of healthcare professionals to share end-to-end responsibility for the collective health of large populations and be paid collectively for quality-based results and outcomes.
4. **Community-based care** will become increasingly important to support wellness and aging in place, and to care for patients in the most cost-effective locale that is suitable for their needs. Care capacity will be built out towards the home and community instead of the hospital and campus, and will rest on a growing workforce of community health workers who must be trained, monitored, and evaluated, and whose workflows must be supported with mobile tools and information.

Enabling Technologies

Figure 1 illustrates IT capabilities that will be critical as healthcare teams strive to deliver high-quality, longitudinal, holistic care for a large group of diverse patients.

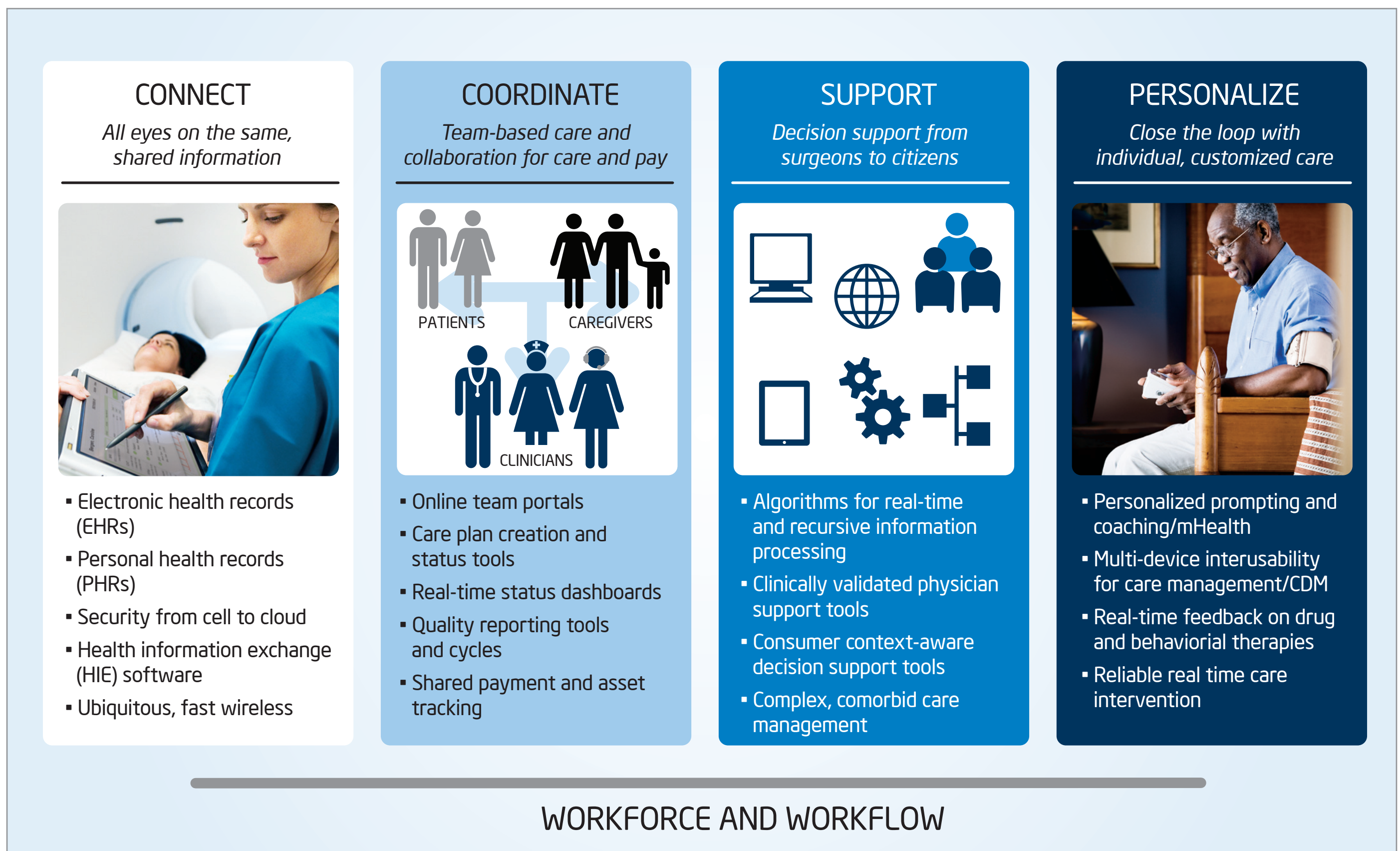

Figure 1. Enabling technologies for coordinated care.

We see these capabilities rolling out in overlapping and not-always-sequential phases, but moving, in general, from basic connectivity of traditional health information to greater and greater levels of decision support, coordination, and personalization in using that information.

The build-out of electronic health records is a necessary first phase that provides a base for information exchange and allows for a range of increasingly real-time care coordination tools. In phase 2, the information and tools improve coordination by enabling co-present and virtual teams to know the patient's status and who last touched a patient, and to assign follow-up tasks to the most appropriate stakeholders. In phase 3, increasingly rich decision support tools turn "data" into useful "information" in highly contextualized ways that help improve clinical decision-making in this highly complex world of healthcare. In phase 4, we "close the loop" with patients as we care for them in a more personalized way—customized for their unique body, genetics, disease, lifestyle, and healthcare goals—than is possible with today's population-based medicine.

Connectivity

Coordinated care requires a change in care culture, rewards, infrastructure, and relationships between patients, clinical staff, and family caregivers. It calls for the creation of "accountable care cultures" that work together in coordinated, collaborative ways to drive better health prevention, personalized treatment, and positive outcomes.

Technology can support this transformation by delivering vital information and tools that meet clinician and patient needs. However, this information exchange will often require the ability to transact care across organizational boundaries with groups that may join an ACO but have completely different tools and protocols on their side of the firewall. People with a valid need for information can include patients and their families, primary care providers and hospitals, as well as ancillary services and other stakeholders such as diagnostic labs, home health personnel, pharmacists, emergency response teams, researchers, payors, and quality management organizations. Foundational technologies for an alternate care delivery organization will include:

- EHRs that meet the meaningful use criteria defined by the Centers for Medicare & Medicaid Services (CMS) and the Office of the National Coordinator for Health Information Technology (ONC)
- Health information exchanges and middleware to facilitate the ability to transact care with people whose organizations are using different EHRs, information tools, and organizational rules
- Secure, high-speed networks across organizations and throughout the community with robust wireless connectivity in hospitals and clinics
- Scalable, energy-efficient infrastructure and client devices that enable robust, end-to-end security and can be managed remotely

Coordination

ACOs and other new care delivery models demand expanded capabilities for care coordination and an ability to track quality outcomes not previously required in healthcare. ACO leaders will need to conduct a stakeholder analysis to identify who in their community must be at the table to make an ACO work. Care transitions such as a hospital admission or discharge will provide important opportunities to reduce costs and improve quality, so analysis can also focus on facilitating a smooth handoff from one team to another, including from the care organization to patients and their support system. Asking simple questions—what metrics do we want to affect, who needs to be involved to impact this metric, when should they be involved, who do they interface with, what information do they need?—can start an important and useful planning process. Tools and capabilities to improve care coordination include:

- Online portals to provide secure, one-stop access for cross-organizational collaboration
- Authentication tools to safeguard patient confidentiality
- Groupware tools and shared real-time status dashboards, which can help clinicians plan and prioritize their time and workloads
- Teleconferencing capabilities to support collaboration among clinical experts at multiple locations
- Tracking and audit capabilities to monitor the quality of delivered care

Decision Support

Given the complexities of patient care and the ever-increasing options for treatments and diagnostics, any coordinated care system will want to have increasingly intelligent decision support tools for all the major actors: doctors, nurses, non-clinical community health workers, and even family members and patients themselves. Using decision support tools throughout the care network can help drive better triage and utilization of expensive healthcare resources. Care delivery teams will want to establish:

- Standards for nomenclature and other terminology
- Clinical decision support systems
- Authoring tools for creating personalized care plans
- Tools and portals to aid consumers with decision support and triage

Community, Home, and Individual

To sustain cost decreases while increasing access and quality, ACOs will strive to shift care to the home and community when appropriate. It's critical, therefore, that IT strategies encompass the home and community and that IT build-out extend beyond the bricks and mortar of hospitals and clinics.

A strategy to develop electronic care (e-care) capabilities will be crucial to enable place-shifting and skill-shifting of care out of expensive Emergency Department and in-patient hospital settings to the home or community health center. (Note that the lower-cost settings are also generally safer and more comfortable for patients.)

As coordinated care organizations build a comprehensive understanding of each enrollee, they will seek technologies that enable them to deliver efficient, personalized care that is uniquely applicable to each enrollee's goals, medical history, genetic makeup, and more. Just as many corporations use business intelligence and social media to build a "market of one" relationship with each customer, so ACOs will be able to work closely with their enrollees to optimize their health and adjust care plans in real time to respond to the latest research discoveries.

Information technologies should support capabilities such as:

- Remote patient monitoring to motivate adherence to treatment plans and enable proactive interventions
- Telehealth and virtual visits to minimize the need to bring patients into the clinic or hospital
- Secure, high-speed, community-wide broadband networks to facilitate access to patient education portals and personal health records (PHRs) by patients, and to clinical portals by community health workers
- Health solutions that promote behavioral change and engagement with enrollees via their mobile devices to offer coaching and reminders, collect data, and perform other functions
- Analytical software that can combine multiple information streams to facilitate truly personalized care and improve outcomes

Workforce and Workflow

Many healthcare organizations are investing in IT tools to improve the efficiency of their clinical workforce. While such investments are highly beneficial, coordinated care leaders must also assess the overall ACO workforce and workflow to map out just how an ACO will ultimately work and identify the kinds of IT tools that can help enable the new care models and work flows. In addition, just as ACOs will place-shift care from expensive clinic and hospital locations when appropriate, they will also need to skill-shift when appropriate to less highly trained professionals. With necessary training, support, safeguards, and IT tools, non-emergency and non-clinical aspects of care can be shifted to trained community health workers or volunteers, engaged family members, and patients themselves. Tools to support the evolving workforce and workflow requirements include:

- Online portals for social support, education, personal health records, and so forth
- Volunteer training, management, tracking, and time-banking software
- Secure messaging
- Care coordination tools with outside-in, temporary, and limited access
- Call support and virtual call center IT to support flexible, cost-effective, home-based call center capabilities

We see new capabilities rolling out in overlapping and not-always-sequential phases, but moving from basic connectivity of traditional health information to greater levels of decision support, coordination, and personalization in using that information.

Starting Now: Incremental Steps to Coordinated Care

So, where do you start to architect and deploy information infrastructure for a fledgling ACO or other coordinated care model? Figure 2 shows four steps that can deliver near-term value while moving you toward integrated care delivery. You can start with any of the four, and to realize the true cost savings and the patient care benefits of coordinated care, you will eventually want to do all four.

For example, if you want to begin with Gather and Store (which is also the first phase of meaningful use), you can start by creating a data repository: identifying what data you need to gather, who you're going to gather it from, what policies will govern patient participation (opt in vs. opt out), whether you'll use a federated or centralized storage model, how you're going to handle privacy, security, and authentication, and so forth. If you want to share a coordinated data flow, you can start by building a health exchange, working through an equivalent set of issues and further demonstrating meaningful use of EHRs.

To improve workflow, you might look at something as simple as establishing mechanisms and policies for secure e-mail communications between providers and patients, or equipping your hospital's rounding clinicians with laptop or tablet PCs and a mobile workflow application. To reduce unnecessary hospital admissions and facilitate smoother admissions, you might collaborate with your community's emergency response teams and enable them to access summary information about a patient whose home they are approaching. With better information about the patient's underlying medical issues and care preferences, EMTs may be better able to meet the patient's needs and promote appropriate resource utilization.

If you want to reduce readmissions and empower patients with multiple chronic conditions to care for themselves at home, you could start with a home care program and implement remote patient monitoring (empowering the patient) or improving the information flow between discharge teams, home health teams, and patient support systems (empower the patient, share the data). Whichever step you start with, you'll be generating data to which you can eventually apply clinical decision support to improve patient care.

Table 2 summarizes the progression that organizations typically make as they evolve toward integrated care delivery. Note that the functions and technologies shown in this table are additive.

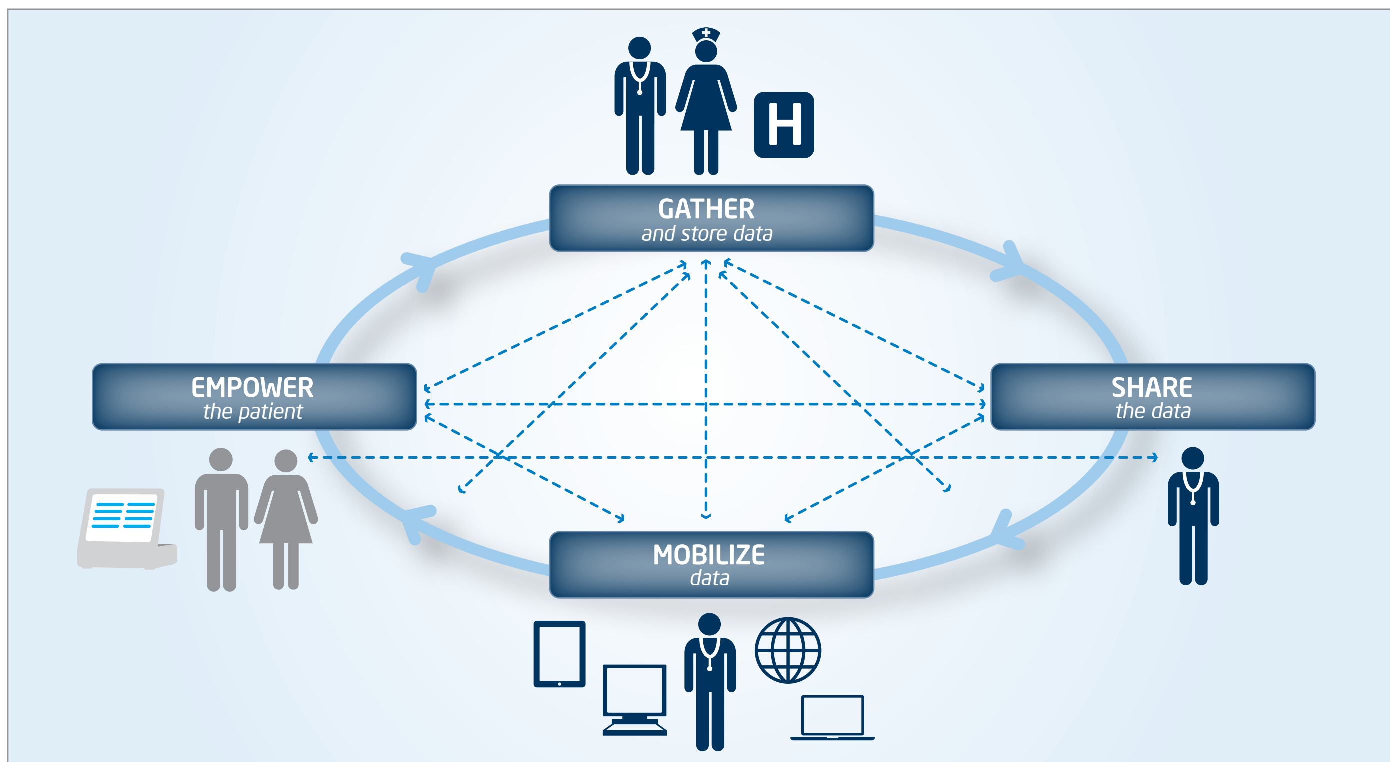

Figure 2. Data flow for care coordination.

Table 2. Stages of Care Coordination

	Phase 1: Basic	Phase 2: Early Coordination	Phase 3: Strong Coordination
Organizational Structure	▪ Single hospital ▪ Independent physician office	▪ Hospital system ▪ Physician group ▪ Integrated delivery network (IDN)	▪ RHIO/HIN ▪ Group model HMO ▪ ACO in the U.S. ▪ National Health System
Financing	▪ Fee for service ▪ Salary	▪ Discounted fee for service ▪ Episodic payment ▪ Risk pools	▪ Capitation ▪ Bundled payment ▪ Transaction fees
Functions	▪ Scheduling ▪ Billing	▪ Patient billing ▪ Claims payment ▪ Business process automation ▪ Case management ▪ Post-acute care	▪ Disease management ▪ Care coordination ▪ Community-based care ▪ Complexity management ▪ Outcomes tracking
Technologies and Solutions	▪ Paper-based ▪ Stand-alone billing and scheduling	▪ Financial systems ▪ EHR ▪ ePrescribing ▪ Mobile point of care ▪ Imaging	▪ Health information exchange (HIE) ▪ Longitudinal health record ▪ Service oriented architecture (SOA) ▪ Telehealth ▪ Secure cloud

Moving Forward

Very little of what we're talking about in this paper is easy—it will require behavioral and cultural changes, with careful attention to workflow redesign, workforce development, and business process. Nor is this a one-time fix. Rather, healthcare reform and innovation must become an ongoing part of the healthcare culture, and both process changes and infrastructure build-out must be ongoing and iterative.

Intel has a wealth of experience helping leaders in healthcare and other industries transform the way they use information across organizational boundaries to work in new ways.

We have found ethnographic work and people-centered methodologies provide a powerful way to help industries and organizations work through the human issues, as a starting point for eventual technology deployments that are strategic and valuable to all stakeholders.

ACOs offer a significant opportunity for the U.S. to move toward coordinated care delivery and payment reform. More broadly, ACOs and other models of alternative care delivery are a response to unavoidable demographic and cost trends. These models represent a tremendous opportunity for healthcare leaders to truly lead—to get ahead of changes that are inevitable and chart a course to higher-quality, more accountable, and more cost-efficient care.

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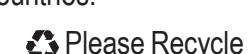

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