



Care Coordination Approaches with Microsoft Technologies

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Table of Contents

What is care coordination and why is it important?	1
Care coordination: A definition	2
Implications for healthcare systems.....	4
Microsoft HealthVault Community Connect: A care coordination solution.....	6
HealthVault Community Connect and meaningful use requirements.....	8
Care coordination in action	9
Brooks Rehabilitation, Jacksonville, Florida.....	9
PeaceHealth – St. Joseph Medical Center, Bellingham, Washington.....	9
Mason General Hospital, Shelton, Washington	9
Meeting tomorrow’s demands.....	11

What is care coordination and why is it important?

The premise is clear: If all the people involved in the care of a patient—the specialist, the primary care physician, the radiologist in the MRI facility, the technician in the lab, the nurse in the hospital, the doctor in the emergency room (ER), family members, and even the patient—are all working from the same complete information, then the

quality of patient care is likely to improve, along with both care team and patient satisfaction. That's the promise of care coordination, that a patient's health history—along with the knowledge of the recommended actions to take and when to take them—is shared with the appropriate stakeholders over time, across facilities, and among practitioners. Seamless sharing of information and knowledge helps avoid redundant tests, medication mistakes, and readmissions, which results in more satisfied patients who are receiving better care. In addition, in a coordinated care model, healthcare providers, family caregivers, and patients themselves are all more informed and can better ensure consistent follow-up care.

As more healthcare organizations move to models of accountable care, where they're reimbursed for results rather than by volume of procedures, care coordination becomes particularly important. If you can't eliminate waste and maintain quality, then the economics of being an accountable care organization (ACO) become problematic. Today, care coordination can help improve patient outcomes and experiences. Tomorrow, it will have

an impact on a healthcare organization's bottom line as more payers link quality and outcomes to reimbursement rates and penalties. The trend is bound to accelerate as Medicare, meaningful use, and American Recovery & Reinvestment Act of 2009 (ARRA) regulations and mandates come into full force.

Even if healthcare organizations did no more than coordinate the admission and discharge process for the 37 million discharges that occur in the United States annually, the benefits would be plentiful. Patients would be better informed and their

How big a problem is lack of coordinated care? Various studies report that:

- Twenty-five percent of referring physicians do not receive consultation reports from a specialist within four weeks after the consultation visit.
- Less than half of primary care doctors are given information about the discharge plans and medications of their recently hospitalized patients.
- Thirty-three percent of physicians do not consistently notify patients about abnormal test results.¹

¹ Bodenheimer T. "Coordinating care – A perilous journey through the health care system." *New England Journal of Medicine* 358(10), 1064-1071.

physicians would be equipped to provide good follow-up care, which would reduce the likelihood of readmission. As a side benefit, referring physicians, who receive complete and usable information from hospitals, will have a higher degree of loyalty to those institutions that keep them informed.

Care coordination: A definition

Care coordination refers to the action of a team of caregivers, working with the patient and the patient's family to organize care across settings and over time. It's a core activity for those organizations moving toward becoming patient-centered medical homes, or moving toward the ACO model.

Care coordination can benefit healthcare systems by:

- Increasing patient loyalty.
- Boosting referrals.
- Growing reimbursements and managing accountable care costs.
- Improving follow-up care post discharge.
- Advancing patient compliance with discharge instructions.
- Streamlining physician provisioning.
- Avoiding unnecessary procedures and testing.

The chief goal of coordinated care is to make healthcare systems more responsive to the needs of patients, particularly those with complex chronic illnesses, which account for about 75 percent of today's healthcare costs. However, current systems often fail to meet those needs. Care is fragmented, with little communication among the various professionals who provide treatment. About one-third of U.S. patients reported problems with the coordination of their care, such as test results not being available when they arrive at an appointment, or doctors ordering duplicate tests.²

Fragmentation of care and lack of follow-up puts patients at risk of costly health crises, such as emergency room visits and unplanned hospitalizations. One study of Medicare patients found that nearly one in five hospitalizations resulted in a readmission within 30 days of discharge and that three-quarters of these could have been prevented by better coordinated care.³ The price tag to Medicare alone for these readmissions was U.S.\$15 billion for just 30 days' worth of readmissions.⁴

² "Primary Care and Health System Performance: Adults Experiences in Five Countries." *Health Affairs*, 2004.

³ Jencks SF, Williams MV, Coleman EA. "Rehospitalizations among patients in the Medicare fee-for-service program." *New England Journal of Medicine*, 2009. 360(14), 1418-1428..

⁴ Hackbarth GM. "Reforming the health care delivery system." Testimony of the Medicare Payment Advisory Commission Chairman before the Committee on Energy and Commerce, U.S. House of Representatives, March 10, 2009 "Quantifying the Economic Impact of Communication Inefficiencies in US Hospitals."

Another study, by the University of Maryland, has put the cost of poor communication and lack of information technology in U.S. hospitals at \$12 billion a year. Importantly, the study projected that if communication inefficiencies could be eliminated, the average hospital's profit margin would almost double from the industry average of 2 percent to 3.6 percent.⁵

Clearly, lack of coordination can be unsafe, as when abnormal test results are not communicated correctly, or when prescriptions from multiple doctors conflict. It can also be costly as a result of duplicated services, preventable hospital readmissions, and the overuse of intensive procedures.

On the upside, when care coordination is in place and all members of the care team have easy access to shared clinical data, the possible benefits are manifold:

- Higher satisfaction among patients, community providers, and staff.
- Increased provider referrals when physicians receive the reports they need to care for their patients.
- Lower administrative costs from the automation and simplification of the discharge process. Hospitals can dramatically reduce readmissions and yield potential savings of about \$400 per hospitalization by reengineering the discharge process, better educating patients about what they need to do after leaving the hospital, and improving communication between inpatient and outpatient clinicians and at-home caregivers.⁶
- Improvement in quality and patient safety measures as a result of access to a more complete picture of a patient's health history.
- Reduction in redundant procedures, medications, and tests, which helps to lower patient risk and treatment costs. For example, it is estimated that \$8.2 billion in annual spending is due to duplicative testing in hospitals, most often because physicians can't readily obtain prior test results.⁷

Retrieved January 13, 2011 at www.rhsmith.umd.edu/CHIDS/pdfs_docs/ResearchBriefings/CHIDS-ResearchBriefing-Vol3Issue1a.pdf

⁵ "Quantifying the Economic Impact of Communication Inefficiencies in US Hospitals." Retrieved January 13, 2011 at www.rhsmith.umd.edu/CHIDS/pdfs_docs/ResearchBriefings/CHIDS-ResearchBriefing-Vol3Issue1a.pdf

⁶ Darling, Helen and Milstein, Arnold. "Better U.S. Health Care at Lower Cost." *Issues in Science and Technology*. Retrieved January 13, 2011 at <http://www.issues.org/26.2/milstein.html>

⁷ Ibid.

Implications for healthcare systems

Although the benefits of care coordination are apparent, there are broader implications that arise from moving toward a care coordination model for acute care organizations. To be effective, care coordination should encompass three areas: aggregation, transformation, and distribution. Data of a heterogeneous nature—such as images, patient charts, discharge instructions, and self-administered blood pressure readings—must be collected and aggregated from diverse sources and form factors. The aggregated data must then be transformed into knowledge that care providers and patients can act on easily. Lastly, that knowledge must be delivered to the right recipient through the right method at the right time to make a difference.

Each of these areas has its own challenges and issues. Information comes from many sources and in various formats, including clinic-based paper records. As a result, hospitals need to come up with a care coordination system that can adapt to almost any type of data, including discharge summaries, labs and medication information, and handwritten notes. Additionally, both the referring practitioner and the patient should be able to receive data from the healthcare organization. Taken together, these demands mean that data management and exchange models must be extremely flexible and ready for future changes.

The care coordination model should also be seamlessly incorporated into how people currently manage their jobs, and should provide them with insight into how they can do their jobs even better. For example, unaffiliated providers should be able to see their patients' complete electronic medical record, including discharge reports, to make data-driven decisions. Patients would follow their discharge instructions more closely if they had easy access, via their computer, to that information. For the biggest impact, the exchange of information needs to be captured and shared before, during, and after hospitalization, and it should be created in forms and data feeds that are accessible to people who are not normally part of the organization's data ecosystem. This kind of flexibility may require investment in personal health record (PHR) systems, physician portals, provisioning tools, and more. And of course, all of this should occur in compliance with the Health Insurance Portability and Accountability Act (HIPAA).

Most coordinated care point solutions solve some, but not all, of the challenges that healthcare organizations typically face. For example, they may solve data exchange challenges, discharge summary distribution problems, patient engagement and consent matters, or workflow issues. Or, they may just provide an electronic medical

records (EMR) solution. Few products integrate care coordination into a single, manageable application.

Healthcare organizations need a solution that:

- Aggregates heterogeneous data from multiple systems without needing to rip and replace existing systems.
- Provides flexible ways of viewing data so that the user can make better decisions.
- Delivers data and knowledge to patients and providers (for example, delivers discharge summaries to care providers, family caregivers, and patients).
- Delivers data at the right level, from a single lab test result to summary reports.
- Enables proper matching of patients with providers, and manages requests from patients and providers to help meet security and compliance concerns.
- Includes workflows for connecting patients with their data and connecting patients to their providers.
- Records patient consent when providers require health information.
- Provides seamless data exchange between the hospital and PHR system.

This last point is particularly important because patients are becoming active partners in their health. For example, they now have the ability to monitor their own conditions (such as taking blood pressure or blood sugar readings) and upload data to their PHR, which they can then choose to share with their physicians. Clinicians and patients can provide information to each other through a connected PHR so that both parties can more easily identify appropriate care actions. A physician who has a patient with high blood pressure could monitor the patient's readings on a daily or weekly basis. This would help the clinician identify potential problems earlier, when they are easier to treat. The optimal solution would also provide hospital staff with self-service reporting and decision support. It would provide out-of-network physicians with relevant information and record patient consent to share information.

That's no small feat. But there is a solution that provides many of these coordinated care necessities.

Microsoft HealthVault Community Connect: A care coordination solution

Microsoft HealthVault Community Connect is an on-premises portal solution that provides healthcare organizations, patients, and referring providers a place to connect and share health information before and after treatment.

Community Connect uses a limited version of Microsoft Amalga to aggregate a specific patient's health information that may be stored within multiple separate systems in the hospital, and then presents this information to patients and referring providers through customizable patient and provider portals based on Microsoft SharePoint Server.

In addition, Community Connect offers patients a way to better manage their own health information by connecting with Microsoft HealthVault⁸. HealthVault is a free online service that lets patients store health data from many sources—health and fitness applications, pharmacies, health devices, and more—and then organize, manage, and share it with people they trust. And since 59% of all adults in the U.S. look for health information online, there is a large audience of patients interested in engaging in their health via the internet.⁹

Thanks to Community Connect, patients can easily make a copy of their hospital visit summary to their HealthVault account, and then work with their information using dozens of specialized health tools already available today. They can even preregister online for their hospital visits using the information they have stored in HealthVault, helping them remember relevant details and avoid the annoyance of filling out paper forms. Working together, Community Connect and HealthVault help healthcare organizations offer new online services for their patients.

⁸ To learn more about Microsoft HealthVault, visit www.healthvault.com.

⁹ PewInternet, [Health Topics](#), by Susannah Fox, Feb 1, 2011

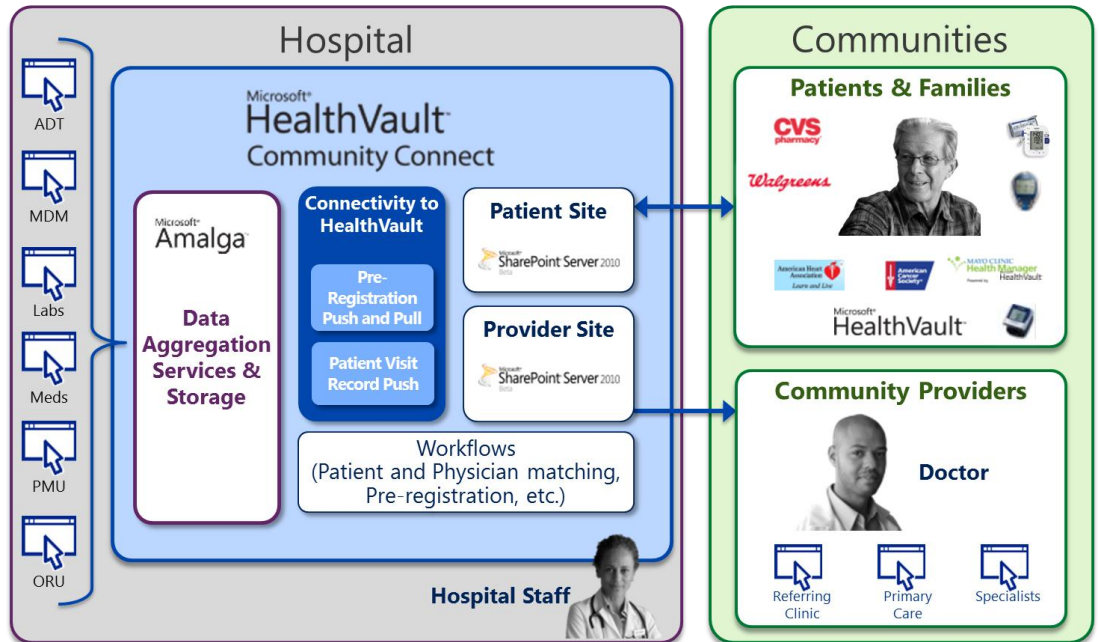


Figure 1: High-level architecture of HealthVault Community Connect

Affiliated and nonaffiliated clinicians can use Community Connect to get a longitudinal view of data the hospital holds about their patient, which is gathered from the multiple enterprise data sources that are available in the healthcare organization. After clinicians are authorized, they can export patient visit summaries to their electronic medical record systems.

This solution helps healthcare organizations build loyalty with providers and patients; simplify care coordination by sharing patient health information electronically within the care team; improve health outcomes by ensuring that affiliated and nonaffiliated clinicians have access to a rich set of patient information; and reduce administrative costs by allowing hospitals to offer patients electronic preregistration services, to decrease registration time.

HealthVault Community Connect and meaningful use requirements

To support healthcare organizations in complying with meaningful use requirements, Microsoft is pursuing modular certification for HealthVault Community Connect in the areas of “Engage patients and families,” “Improve care coordination,” and “Ensure adequate privacy and security protections.”

Meaningful Use Outcomes	Care Goals
Engage patients and families	<ul style="list-style-type: none"> ▪ Patient e-Copy – 170.304(f) ▪ Timely Access – 170.304(g) ▪ Patient Clinical Summary – 170.304(h) ▪ Patient Discharge Instructions – 170.306(e)
Improve care coordination	<ul style="list-style-type: none"> ▪ Exchange with Providers – 170.306(f)
Ensure adequate privacy and security protections	<ul style="list-style-type: none"> ▪ Access Control -170.302(o) ▪ Emergency Access – 170.320(p) ▪ Automatic Log-Off – 170.302(g) ▪ Audit Log – 170.302(r) ▪ Integrity – 170.320 (s) ▪ Authentication – 170.302(t) ▪ General Encryption – 170.302(u) ▪ Encryption While Exchanging Health Info – 170.320(v) ▪ Accounting of Disclosures (Optional) – 170.320(w)

Table 1: Meaningful use requirements supported by HealthVault Community Connect

For more information about HealthVault Community Connect, visit www.whatsnextinhealth.com/communityconnect.

Care coordination in action

Brooks Rehabilitation, Jacksonville, Florida

“At Brooks, more than 97 percent of our hospital admissions come from referring acute care hospitals, and after being discharged from the ER, a single stroke patient, for example, can be placed in up to four different care settings within the first 60 days of onset. We needed a solution that facilitates the continuity of care within and beyond our walls, breaks down silos, and helps Brooks be more patient-centric. HealthVault Community Connect is helping us achieve our goals.”

Karen Green, Chief Information Officer, Brooks Rehabilitation.

Brooks Rehabilitation, one of the largest inpatient rehabilitation hospitals in the country, has deployed HealthVault Community Connect to help build stronger connections with its community of more than 2,000 referral sources in Florida and southern Georgia, and to help create a coordinated continuum of care as its patients move from one care setting to the next. Brooks worked with Aspect, a Microsoft HealthVault Community Connect solution provider, to launch Brooks Health Connect, a patient and provider portal targeted initially at spinal cord and stroke patients, which is now expanding to focus on the broader Brooks patient population. Using HealthVault Community Connect to share information with patients and the referral community, Brooks Health Connect is designed to help patients with life-changing conditions more easily manage their healthcare over extended periods of time and help avoid readmission to acute care facilities.

PeaceHealth – St. Joseph Medical Center, Bellingham, Washington

With support from HealthVault Community Connect solution provider Parker-Affirma, and PeaceHealth PHR vendor Congral LLC, the Joint Center has implemented a comprehensive preregistration and discharge process that has been selected for a Medicare-sponsored program aimed at proving the value of discharge process best practices that can be replicated throughout the country’s healthcare system.

Mason General Hospital, Shelton, Washington

“At Mason General, we believe delivering the highest-quality healthcare depends on our ability to make all relevant information accessible whenever, wherever, and however it’s needed. This vision applies not just to physicians in our health system but also to patients, families, and the referring physician community. With HealthVault

Community Connect, we can extend processes beyond our hospital walls, provide patients and physicians with easy access to important care information, and improve the experience of every participant in the care process, before, during and after treatment.”

Eric Moll, Chief Administrative Officer, Mason General Hospital

Mason General Hospital is a critical access hospital and one of the highest-rated “Most Wired” hospitals in Washington State. For the third consecutive year, Mason General Hospital has received national acclaim for its health information technology, according to the results of the “2010 Most Wired Survey” in *Hospitals & Health Networks*, the journal of the American Hospital Association.

Mason General Hospital has implemented a new patient and physician portal to better engage patients in their healthcare and to improve patients’ experience with the hospitals and its clinics. Pulling data from the hospital and clinics’ EMR applications, the portal solution gives patients the ability to view their electronic visit summaries. Patients can also send a copy to a personal HealthVault account, where the information can be stored and shared as desired with other healthcare professionals, family members, and caregivers. Patients can also use their personal health information in HealthVault—including medical history, medications, and insurance and demographic information—to automatically populate the hospital’s registration forms before their next scheduled visit, potentially saving time and improving the consistency of the information being entered. This solution is being rolled out initially to over 20,000 ER patients at Mason General. Tectura Corporation, a Microsoft HealthVault Community Connect solution provider, has collaborated on the MyMasonHealth implementation and provides ongoing support.

Meeting tomorrow's demands

Microsoft is helping healthcare organizations leverage information, gain insights, and promote continuous improvements across the organization, so providers can tackle their most pressing priorities and focus on delivering the highest quality of care. Microsoft Amalga, Microsoft HealthVault, HealthVault Community Connect, and our portfolio of identity and access management solutions (acquired from Sentillion Inc. in 2010) help organizations address the many challenges they face today. To deliver better outcomes, organizations need to reduce costs while continuing to improve quality, manage health across populations, simplify access to clinical systems, coordinate care across communities, and engage patients. Most importantly, these solutions equip you for success in today's—and tomorrow's—dynamic healthcare environment.

Microsoft brings you health solutions for the way people aspire to work and live.

For more information about Microsoft's care coordination solutions, visit www.whatsnextinhealth.com/communityconnect or contact Microsoft at mshvccb@microsoft.com.

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