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# Health Information **Technology**: A Path to **Improved** Care Transitions and **Proactive** Patient Care

Care transitions can be problematic and costly—even perilous—to older patients. Can a concerted investment in health information technology smooth the path toward better care?

While receiving healthcare services, people are often required to move from setting to setting: from a hospital to home, from a primary care doctor to a specialist, from a nursing home to a hospital. In much of the U.S. healthcare system, and particularly for older adults, such transitions between care settings can be unpleasant—even dangerous—and can lead to poor health outcomes and increased costs (Jencks, Williams, and Coleman, 2009; Coleman and Berenson, 2004).

Health information technology (IT) offers potential solutions to many of the key problems that occur during transitions of care, such as lack of coordination between care providers or challenges accessing the right information at the right time. Health information technology and care transitions have received increasing national attention and have benefitted from significant federal and private investments. This article presents a discussion of the status of health IT in the United States, and technology's role in improving care transitions. We describe a multi-sector effort to promote high-quality,

IT-enabled care transitions that led to a 2011 national meeting, "Putting the 'IT' in Care TransITions," and subsequent ongoing efforts.

## The Advent of Health Information Technology

Over the past twenty years, IT has transformed the way people interact with the world. However, the healthcare sector is in the early stages of realizing IT's benefits and its potential positive impact on healthcare quality (Bates and Gawande, 2003; Buntin et al., 2011). Electronic health records (EHR) adoption has dramatically increased over the past four years; more than one-half of office-based physicians (55 percent) have EHRs today, up from 17 percent in 2009 (Jamoom et al., 2012). However, the one-third who have EHRs may find their EHRs lack basic but important features such as access to laboratory and imaging results or computerized physician order–entry technology (Decker, Jamoom, and Sisk, 2012).

The federal government has made substantial investments over the past decade to promote

health IT adoption among providers and build a supportive national infrastructure. To coordinate national efforts and direct investments, the Office of the National Coordinator (ONC) for Health IT (situated in the Department of Health and Human Services) was created in 2004 through an Executive Order and legislatively mandated in the Health Information Technology for Economic and Clinical Health Act (HITECH Act) of 2009. With support of the HITECH Act over the past two years, the healthcare delivery system, providers, consumers, technology developers, and innovators have made tremendous progress in improving healthcare through computerization and digital networks (see *www.healthit.gov*).

At the same time this investment was being made in health IT infrastructure, the federal government, the healthcare sector, private philanthropy, and other stakeholders were increasingly focused on transitions between care settings because of their link to costly, dangerous, and avoidable hospital re-admissions. National advocacy groups have formed, such as the National Transitions of Care Coalition and the Long Term & Post Acute Care (LTPAC) HIT Collaborative. The federal government has dedicated large investments in this area, including the $500 million community-based care transitions program (Section 3026 of the Patient Protection and Affordable Care Act) and the $500 million federal safety effort known as Partnership for Patients, which also addresses transitions of care. In 2010, the Administration on Aging, now part of the U.S. Administration for Community Living, funded the spread of evidence-based transitions models that link medical care to the aging network's social supports and services.

In the private sector, a core group of foundations has had a long history of funding local, regional, and national efforts to improve care transitions. The John A. Hartford Foundation, which has a mission to improve the health of older adults in the United States, has invested nearly $27 million over the last decade in the development, testing, and dissemination of a number of widely used transitions models focused on older adults—the most common

*From 2009 to 2011, the electronic health records adoption rates among physicians 65 and older increased from 8 to 23.9 percent.*

"frequent fliers" of the healthcare system. Another notable philanthropic organization in this area is the Gordon and Betty Moore Foundation, which seeks to advance patient care and the quality of healthcare in the San Francisco Bay Area. In 2010, these two foundations highlighted the need to focus on care transitions to the ONC, which led to a larger-scale effort in 2011 to bring health IT and care transitions together on a national stage.

### The Federal Mission to Implement Technology

The Office of the National Coordinator for Health IT is the principal federal entity charged with coordinating nationwide efforts to implement and use the most advanced health information technology to help achieve better health and better care at lower cost. The core of its mission is to promote the development of a nationwide health IT infrastructure that allows for safe and secure electronic use and exchange of health information.

Over the past several years, the ONC has worked with other federal agencies and private organizations across the country to create a vision for how technology can help achieve a more modern, affordable, and coordinated healthcare delivery system. With improved technology and systems, information can follow patients no matter where they receive care, and caregivers can access the most complete, up-to-date information about loved ones. These collaborative efforts are enabling much needed

improvements in care transitions—changes that are benefitting patients, care providers, and caregivers.

## The HITECH Act: national, cooperative, and secure information

The passage of the HITECH Act in 2009 added unprecedented focus to these efforts. As a result of HITECH, the ONC launched a comprehensive agenda to create a nationwide, interoperable, private, and secure electronic health information system. ONC policy leaders captured the connection between the HITECH Act and broader calls for reform in a 2010 *Health Affairs* article (Buntin, Jain, and Blumenthal, 2010):

> *Although HITECH may be viewed narrowly as legislation to stimulate the adoption of health information technology, it is better understood as an essential foundation for our broader efforts to restructure health care delivery. The rapid 'wiring' of American health care that will take place under HITECH will do more than simply digitize paper-based work. It will facilitate new means of improving the quality, efficiency and patient-centeredness of care.*

Today, providers and communities across America are demonstrating how the practical use of technology can improve transitions of care, keep people healthier, and reduce errors and waste.

## Meaningful use of EHRs, security, and sharing

Three key components are central to the architecture of a health IT infrastructure capable of supporting improved outcomes: the adoption and meaningful use of EHRs; the safe and secure exchange of information; and the interoperability of technology.

Meaningful use of EHRs serves as an important touchstone of the HITECH Act. Meaningful use goals do not address technology, they address outcomes that matter to patients and their families, such as the following:

- Improving the quality, safety, and efficiency of care, while reducing disparities in access and health;
- Engaging patients and families in their own care;
- Promoting public and population health; and,
- Promoting the privacy and security of electronic health records.

In order to create an environment that supports the adopting of technology, HITECH included provisions for EHR certification, and made incentive payments available to providers who achieved meaningful use goals. Regional organizations (Regional Extension Centers) have also received funding to provide local, on-the-ground resources for eligible hospitals and physician providers seeking to implement or upgrade an EHR system (CMS, 2012).

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Remarkable progress has been made since the start of the Medicare and Medicaid EHR Incentive Programs. In addition to the doubling of EHR adoption from 2008 to 2011, from 17 to 34 percent of office-based practices (Hsiao et al., 2011), adoption of basic EHRs increased from 20 to 40 percent among physicians ages 45 and younger and increased from 12 to 31 percent among physicians older than age 55 (Decker, Jamoom, and Sisk, 2012). Finally, according to CMS, more than 160,000 eligible providers and 3,200 hospitals have been paid as part of the EHR Incentive Program (CMS, 2012).

### Addressing Security and Inter-Operability

Beyond adoption, it is important that health information be safely and securely exchanged, and that the technology is interoperable. Since 2010, the ONC has awarded funding to fifty-six states and territories to develop and implement technology and policies that allow providers to

## HITECH Bright Spots: Challenge Grants, Beacon Communities, Consumerism

HITECH supported programs that would demonstrate improvements in health and wellness through technology investment, including the following:

• **Challenge Grant Program**. Four organizations were awarded money to demonstrate how technology investments could help providers such as nursing homes and home health agencies improve transitions of care.

• **Beacon Community Program**. Seventeen of America's "most wired" communities, from Maine to Hawaii, received grants to demonstrate how technology investments could help improve quality, cost, and population health. For example, the San Diego Beacon Collaborative, which includes local hospitals, clinics, emergency medical services, and community-based public health organizations, is focused on expanding electronic health information exchange to improve quality of care and empower patients to manage their own health (*www.sandiego beacon.org*). These communities are providing a glimpse into the brighter future of a healthcare system that is truly modern and connected.

• **Consumer education programming**. A core mission of the ONC is helping patients and families understand the benefits of health IT, specifically how having access to their health information can help improve outcomes. In August 2012, a video was released to help consumers understand how adoption of EHRs and other HIT investments can make a difference (*www.healthit.gov/patients-families/video/health-it-you-giving-you-access-your-medical-records*).

share test results and medication lists, support communication between consumers and providers, and support safe and secure health information exchange.

In order for technologies to "speak" with one another, in 2010 the ONC produced the Standards and Interoperability Framework. This framework addresses such areas as common language, data elements, and quality measurement congruent with entities such as the National Quality Forum, the National Committee on Quality Assurance, the Centers for Medicare & Medicaid Services, and the Institute of Medicine. The ONC has also advanced privacy and security policies to support exchange and inter-operability. Building such policies involves strong partnerships with other public and private entities, and uses vehicles like the Health IT Policy Committee (composed of national health IT experts who advise the ONC).

### Improving Care Transitions with Health IT

Problems related to transitions of care include patients and families not understanding their medications or self-care instructions; patients not seeing a primary care provider following hospitalization; lack of integration between medical care and the necessary supports and services; lack of access to information that impacts the provision of healthcare or patient self-care; and lack of coordination between providers. The promise of technology for good care transitions includes the potential for real-time data, decision support for the healthcare team (including patients and families), immediate access to answers that prevent problems that could lead to rehospitalization, and the elimination of redundant laboratory tests, diagnostic imaging, and procedures.

Evidence-based approaches addressing transitions have been developed (Coleman et al., 2006; Naylor et al., 2004; Jack et al., 2009) and use health IT to varying degrees. Some evidence-based models directly address current health IT gaps. For instance, most EHRs do not

address the needs of older adults with complex health issues, the largest population at risk of poor outcomes related to transitions of care. One example is medication reconciliation. Today's EHRs alert providers if two or more medications in the same class are prescribed. They are not designed to consider geriatric polypharmacy and medications that may be harmful specifically to older adults.

Two health IT models addressing medication management for elders with complex needs are HomeMeds, developed by Partners in Care Foundation (*www.homemeds.org*), and Care Management Plus, a cooperative project between Oregon Health & Science University and Intermountain Healthcare (*www.caremanage mentplus.org*).

There are, however, barriers to adopting health IT that could improve care transitions. These include funding, inter-operability, security, investment return, and perceived compliance issues related to the Health Insurance Portability and Accountability Act. The pace of adoption also varies between hospital-physician practices and post-acute care and long-term-care settings (Coleman, Dorr, and Harvell, 2007). A broader issue is cost—often each innovation adopter has to pay to integrate health IT—a problem that could be addressed through EHR certification standards. But ONC federal initiatives previously described address many of these barriers.

## A Multi-Sector Effort to Improve Transitions

In 2010, the Gordon and Betty Moore Foundation and the John A. Hartford Foundation offered recommendations for the ONC to consider how health IT could best support transitions of care. This began when the foundations co-hosted a meeting where their grantees with expertise in implementing evidence-based models of care provided technical assistance to the ONC's Beacon Communities. Feedback pointed to IT-enabled care transitions as a key leverage point in reducing hospital re-admissions, and as a

critical topic for further national work with a broader group of stakeholders.

In 2011, the ONC and the Moore and Hartford foundations were joined by Kaiser Permanente, the HHS Partnership for Patients, and media partners *Health Affairs* and Health 2.0 to design and conduct an invitational meeting of national stakeholders called "Putting the 'IT' in Care TransITions." On October 14, 2011, nearly 200 people representing innovators, policy and health IT experts, healthcare providers, patient organizations, technology companies, and government agencies participated in the day-long gathering in Washington, D.C.

The meeting had the four following aims: to identify the most intractable challenges of care transitions from the point of view of patients and caregivers; to harvest, through workgroups, the best IT-enabled solutions available, and recommend high-priority areas for IT-enabled innovation; to identify key drivers for the spread and implementation of IT-enabled innovation; and to define areas of emerging consensus through group prioritization.

Meeting participants, organized into workgroups, highlighted five topics viewed as the most important problem areas for patients and caregivers: the discharge process, medication reconciliation, information flow between providers, identification of patients at risk for poor health outcomes, and patient and caregiver engagement. Groups identified promising transitional care models and approaches that work, and uncovered the biggest gaps or remaining problems. They prioritized opportunities for innovation that can improve transitions of care, with a particular focus on IT innovation, and pledged to engage in specific actions in their local communities.

By the meeting's end, the following themes emerged:
• There needs to be a plan of care that spans time and setting, incorporates social and medical factors, reflects patient goals, and is accessible to all care team members;

- Effective and efficient medication reconciliation continues to evade even the most sophisticated providers;
- IT-enabled feedback loops are underdeveloped, but they are critical to ensure safe care and self-management; and,
- Shifting from a hospital-centric model is the most important enabler for the spread and uptake of IT-enabled care transitions solutions.

The meeting concluded with "commitment statements" from attendees, including an ONC-sponsored "Two-Week Challenge" after which participants submitted brief statements regarding immediate action they had taken in

## *Effective and efficient reconciliation of medications continues to evade the most sophisticated providers.*

their local environments. Submissions ranged from having discussions about the topic among local stakeholders to completing a multilingual medication reconciliation module for an EHR system. The ONC Standards and Interoperability leadership also shared updates regarding its transitions-of-care work, and offered a commitment to expand this work to encompass needs of the long-term and post-acute-care community.

Another ONC "Challenge" encouraged software developers to generate an intuitive, easy-to-use application that empowers patients and caregivers using the Medicare Discharge Checklist. The Transition Suite from Axial Exchange (*www.axialexchange.com*), the iBlueButton app from Humetrix (*www.humetrix.com*), and VoIDSPAN from Flexis (*www.flexis.net*) were the winners of the

challenge. A pre-planned communications strategy, including social media, helped spread meeting findings to a variety of audiences. Participants were included in follow-up communications that encouraged continued discussion and collaboration on areas of convergence, such as the development of IT-enabled longitudinal care plans.

## Moving Toward the Vision

Health IT uptake is growing rapidly with strong support and guidance from the Office of the National Coordinator for Health IT, developers, providers, consumers, and philanthropic foundations. It is incumbent upon us all to ensure that the investment in our technology infrastructure draws upon the best available evidence, integrates decision-support for older adults with complex healthcare needs, and engages consumers and their families in their own health. Medication management and reconciliation for the complex healthcare needs of elders should be addressed immediately. Core knowledge exists and should be a fundamental component of the EHR certification process. Perhaps the greatest opportunities to improve transitions lie in our ability to leverage technology in order to un-silo and proactively involve the patient and those who play a role in supporting their health—far beyond medical care.

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## References

Bates, D. W., and Gawande, A. A. 2003. "Improving Safety with Information Technology." *The New England Journal of Medicine* 348(25): 2526–34.

Buntin, M. B., et al. 2011. "The Benefits of Health Information Technology: A Review Of the Recent Literature Shows Predominantly Positive Results." *Health Affairs* 30(3): 464–71.

Buntin, M. B., Jain, S. H., and Blumenthal, D. 2010. "Health Information Technology: Laying the Infrastructure for National Health Reform." *Health Affairs* 29(6): 1214–19.

Centers for Medicare & Medicaid (CMS). 2012. "EHR Incentive Programs." www.cms.gov/Regulations-and-Guidance/Legislation/EHR IncentivePrograms/index.html?redirect=/ehrincentiveprograms/. Retrieved September 15, 2012.

Coleman, E. A, and Berenson, R. A. 2004. "Lost in Transition: Challenges and Opportunities for Improving the Quality of Transitional Care." *Annals of Internal Medicine* 141(7): 533–6.

Coleman, E. A., Dorr, D., and Harvell, J. 2007. *Health Information Exchange in Post-Acute and Long-Term Care Case Study Findings: Final Report*. Prepared for the Office of Disability, Aging, and Long-Term Care Policy, Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. Contract #HHS-100-03-0028. aspe.hhs.gov/daltcp/reports/2007/HIEcase.htm. Retrieved September 15, 2012.

Coleman E. A., et al. 2006. "The Care Transitions Intervention: Results of a Randomized Controlled Trial." *Archives of Internal Medicine* 166(17): 1822–8.

Decker, S., Jamoom, E. W., and Sisk, J. E. 2012. "Physicians in Nonprimary Care and Small Practices and Those Age 55 and Older Lag in Adopting Electronic Health Record Systems." *Health Affairs* 31(5): 1108–14.

Hsiao, C. J., et al. 2011. *Electronic Health Record Systems and Intent to Apply for Meaningful Use Incentives Among Office-Based Physician Practices: United States, 2001–2011*. NCHS Data Brief No. 79. Hyattsville, MD: National Center for Health Statistics. www.cdc.gov/nchs/data/databriefs/db79.htm. Retrieved November 2012.

Jack, B. W., et al. 2009. "A Re-engineered Hospital Discharge Program to Decrease Rehospitalization: A Randomized Trial." *Annals of Internal Medicine* 150(3): 178–87.

Jamoom, E., et al. 2012. "Physician Adoption of Electronic Health Record Systems: United States, 2011." NCHS Data Brief No. 98. www.cdc.gov/nchs/data/databriefs/db98.htm. Retrieved September 15, 2012.

Jencks, S. F., Williams, M. V., and Coleman, E. A. 2009. "Rehospitalizations Among Patients in the Medicare Fee-for-Service Program." *The New England Journal of Medicine* 360(14): 1418–28.

Naylor M. D., et al. 2004. "Transitional Care of Older Adults Hospitalized with Heart Failure: A Randomized, Controlled Trial." *Journal of the American Geriatrics Society* 52(5): 675–84.