



NATIONAL TRANSITIONS OF CARE COALITION

Improving Transitions of Care with Health Information Technology



**Position Paper of the
HEALTH INFORMATION TECHNOLOGY
WORK GROUP for the
NATIONAL TRANSITIONS OF CARE COALITION
December 2010**

December 10, 2010

Improving Transitions of Care with Health Information Technology

Table of Contents

- I. EXECUTIVE SUMMARY2**
- II. INTRODUCTION3**
- III. HEALTH INFORMATION TECHNOLOGY BARRIERS AND GAPS IN SUPPORTING6**
TRANSITIONS OF CARE
- IV. POTENTIAL AREAS FOR IMPROVEMENT IDENTIFIED BY NTOCC11**
 - A. Improve communications during transitions between providers, patients,
and family caregivers
 - B. Develop standardized processes for EMR use, including medication
reconciliation
 - C. Establish points of accountability for sending and receiving care
 - D. Increase use of case management and professional care coordination
 - E. Expand the role of the pharmacist in transitions of care
 - F. Implement payment systems that align incentives and include performance
measures
- V. CONCLUSIONS27**

- APPENDICES**
 - Appendix A. Glossary28**
 - Appendix B. Medication Reconciliation Essential Elements30**

- ACKNOWLEDGEMENTS**

SECTION I:

Executive Summary

Health information technology (HIT) is broadly considered a tool for improving care quality, reducing care disparities, and improving care outcomes, including patient and family experience. The capacity of HIT to improve communication and information sharing makes it a critical tool for addressing the threats to safety and quality during care transitions, and it rightfully receives considerable recognition by numerous stakeholders.

The American Recovery and Reinvestment Act (ARRA) of 2009 recognized the importance of HIT by allotting \$19 billion toward electronic medical records in hospitals and physician offices (commonly known as the HITECH Act). In response, health systems, professional organizations, computing companies, researchers, and others have started investing vast time, energy, and other resources toward determining an electronic system that will improve quality, increase efficiency, and in some cases, add convenience to all involved.

The National Transitions of Care Coalition (NTOCC) believes that for HIT to make a difference in transitions of care, the technology must address several critical steps. The components include standardized processes, good communication, required performance measures, established accountability, and strong care coordination. Without addressing each step, the promise of HIT's affect on overall transition of care improvement will not be realized.

There are many barriers to the adoption of HIT and its capacity to improve transitions of care, as well as barriers to its implementation, use, and usefulness. While health care communities across the U.S. have made strides to research, evaluate, and examine different approaches to improving fragmented care, widespread adoption of a reliable method to improve it is lacking. There is a significant push to adopt technology solutions to assist in improving communication throughout the health care community. Having HIT that communicates beyond the boundaries of a single institution or health system is critical to improving care transitions in the future. This document reviews the most common barriers to using HIT to improve transitions of care.

Because there is little guidance on how to use HIT in ways that specifically improve transitions of care, this paper builds upon NTOCC's overall recommendations for improving transitions of care and the national agenda as it relates to HIT, and identifies problems and considerations as they relate to NTOCC's overall goals.

SECTION II:

Introduction

In spite of world-class clinical advancements and talent, the United States' health and long term care system is plagued by suboptimal care quality. Problems of underuse, overuse, and misuse of health care all contribute to these quality issues.¹ Care episodes often involve numerous settings and multiple highly-specialized professionals, with little or no communication between them. Disparities in care quality among underserved populations are well-documented and lead to exacerbated long-term health issues at both the individual and population levels.

Limitations of Our Current Health Care System

Patients and their family caregivers experience quality problems almost every time they encounter the health care system. Recent surveys by the National Partnership for Women & Families found that there are two very consistent pain points when interacting with the health care system: lack of communication and lack of coordination.² Seventy-four percent of those surveyed said that they wished their doctors talked and shared information with each other. Forty-five percent said that they have had to act as a communicator between doctors who were not talking to each other.

Patients and their families understand that the results of this communication and coordination void include medical errors, testing and treatment duplication, misdiagnoses, and an overall frustrating and sometimes negative care experience. Patients are often sent home without the information and support needed to take care of themselves and do not receive appropriate follow-up care. Evidence shows that 1 in 5 older adults with complex chronic health conditions is readmitted within 30 days of hospital discharge.³ This is further proof that improving outcomes will require improving the safety and effectiveness of care transitions. Improvements in care are needed for all transitions—from one setting to another (e.g., hospital to nursing home), care transitions within an institution (e.g., between units, or emergency department to hospital admission), and from a health care setting to the care of the family and community at home (e.g., hospital or nursing home to home care).

¹ The Overuse, Underuse, and Misuse of Health Care: *Testimony before the Committee on Finance, United States Senate*. (2008) (statement of Peter R. Orszag, Director, CBO).

² Lake Research Partners for the National Partnership for Women & Families.

http://www.nationalpartnership.org/site/DocServer/Lake_Poll_Media_Report_FINAL.pdf?docID=6242. 2010.

³ Jencks S, Williams M, Coleman E. Rehospitalizations among patients in the Medicare fee-for-service program. *New Eng J Med* 2009;360:1418-28.

HIT is broadly considered a tool for improving care quality, reducing care disparities, and improving care outcomes, including the patient and family experience. The capacity of HIT to improve communication and information sharing makes it a critical tool for addressing the threats to safety and quality during care transitions, and it rightfully receives considerable recognition by numerous stakeholders.

In 2008, the Congressional Budget Office (CBO) published a paper that outlines the potential of HIT to improve the transfer and storage of information within the system, and goes on to identify barriers to its adoption.⁴ The benefits of HIT and improvements in efficiency noted include:

- Eliminating paper medical records and expanding the exchange of health information
- Avoiding duplicate or unnecessary diagnostic tests and radiological services
- Promoting cost-effective use of prescription drugs and avoiding adverse drug events
- Improving nurse and physician productivity
- Reducing hospital length of stay
- Improving quality of care and expansion of the practice of evidence-based medicine
- Generating research data on comparative-effectiveness and cost-effectiveness of treatments

It further outlines the evidence on costs associated with implementing HIT in physicians' offices and hospitals. Finally, it describes the evidence regarding the many challenges related to the adoption of HIT. In many instances, physicians will change the way they practice medicine, and radical changes require organizational commitment along with financial investment. Many complex decisions must be made with regard to technology, such as hardware capabilities and interoperability, software vendors and languages, and rapidly changing technology. Further, many small providers are finding it difficult to make the business case for investing in HIT due to misaligned incentives.

The American Recovery and Reinvestment Act (ARRA) of 2009 recognized the importance of HIT by allotting \$19 billion toward the use of electronic medical records in hospitals and physician offices (commonly known as the HITECH Act).⁵ In response, health systems, professional organizations, computing companies, researchers, and others have started investing vast time, energy, and other resources toward shaping an electronic system that will improve quality, increase efficiency, and in some cases, add convenience to all involved. The Act authorizes CMS to provide reimbursement incentives for eligible professionals and hospitals who are successful in becoming "meaningful users" of certified electronic health record (EHR) technology. The work of the Health Information Technology Policy Committee, the Office of the National Coordinator (ONC), and the Centers for Medicare & Medicaid Services, which has recently culminated in a final rule outlining the definition of the

⁴ Congressional Budget Office. *Evidence on the Costs and Benefits of Health Information Technology*. (May 2008)

⁵ Health Information Technology for Economic and Clinical Health (HITECH) Act, Title XIII of Division A and Title IV of Division B of the American Recovery and Reinvestment Act of 2009 (ARRA), Pub. L. No. 111-5 (Feb. 17, 2009).

“meaningful use” basis, clearly articulates the meaningful use of health information technology as a critical foundation for reform.⁶ The Patient Protection and Affordable Care Act of 2010, the health care reform law enacted in March 2010, also contains multiple provisions related to the use of technology to facilitate safer, more effective, and higher quality health care.⁷ The kind of patient-centered health care that individuals want and deserve will not be possible without using technology to support its delivery.

Improving Outcomes By Ensuring Effective Transitions Of Care

One of the primary benefits of using technology in delivering health care is the ability to ensure that the right information is available at all stages of the health care process, especially during critical times of transition. All members of the health care team—including patients and their family caregivers—need access to key pieces of information in order to make transitions of care smooth, safe, and effective. NTOCC has described several steps that are critical to achieving this kind of information sharing:

- Improve communication during transitions between providers, patients, family caregivers and community supports;
- Develop standardized processes for medication reconciliation and care coordination;
- Establish accountability for sending, receiving and acting upon information necessary for safe, effective transitions of care;
- Increase the use of case management and professional care coordination;
- Expand the role of the pharmacist in medication reconciliation in transitions of care;
- Develop performance measures to encourage better transitions of care; and
- Implement payment systems that align incentives.

NTOCC believes that for HIT to make a difference in transitions of care, the technology must address each of these critical steps. Without addressing each step, the promise of HIT’s affect on overall transition of care improvement will not be realized.

⁶ Medicare and Medicaid Programs; Electronic Health Record Incentive Program; Final Rule. Fed Regist. 2010;42 CFR Parts 412, 413, 422 et al.

⁷ Patient Protection and Affordable Care Act, HR 3590 (2010).

SECTION III:

Barriers and Gaps in Supporting Transitions of Care

There are many barriers to the adoption of HIT and its capacity to improve transitions of care, as well as barriers to its implementation, use, and usefulness. While health care communities across the U.S. have made strides to research, evaluate, and examine different approaches to improving fragmented care, widespread adoption of a reliable method to improve it is lacking. There is a significant push to adopt technology solutions to assist in improving communication throughout the health care community and having HIT that communicates beyond the boundaries of a single institution or health system is critical to improving care transitions in the future. Below is a discussion of the most common barriers to using HIT to improve transitions of care.

Barrier/Gap 1: Lack of Connectivity

The lack of connectivity between providers in the health and long term care system is nationally recognized. The Institute of Medicine (IOM) emphasizes that health care quality suffers "due not to a lack of effective treatments, but to inadequate health care delivery systems that fail to implement these treatments."⁸ Fragmented care leads to increased costs—financial, clinical, and at the patient level. Today's inefficiencies unnecessarily increase costs to patients, providers, payers, and employers.

In spite of the adoption of technology in all other areas of our economy as a cost of doing business, health care has yet to experience widespread employment of technology to enable the provision of care. While technology is very common in health care, it has primarily been implemented as a means of increasing revenue, for example, technology that performs administrative functions or technology that can be used as a billable service. Generally, it has not been applied as a tool for providing high quality, safe, patient-centered care. While many providers are moving toward incorporating an HIT system, adoption rates remain relatively low, due in part to high implementation costs, unclear return on investment propositions, and fear of investing in a system that will not meet the provider's needs in the long-term.

Interoperability among the various technology systems—such as administrative systems, medical record systems, diagnostic tools, transcription, security, and others—is a critical issue for transitions of care. Care coordination is a dynamic process that requires data movement across platforms and among service providers in real time. Currently many systems, in spite of being developed by the same

⁸ Institute of Medicine, Priority Areas for National Action: Transforming Health Care Quality (2003). Available at <http://www.nap.edu/openbook.php?isbn=0309085438>. National Academies Press. Washington, D.C.

company, do not talk to each other, creating delays and decreasing the value of the system, which adds cost and erodes quality and timeliness of interventions.

Care coordination is intrinsically interdisciplinary, making communication between disciplines of critical importance. Unfortunately, as with computing language, the medical language spoken by all team members, and especially among patients, is not universal. There are important semantic differences between health professions that will need to be addressed as automated data exchange advances.

Barrier/Gap 2: Lack of Shared Goals Related to Care Transitions

As with so much of the health care system, goals for transitions of care are in silos—each department worrying only about their piece of the puzzle. Pharmacies think about medication reconciliation, admissions departments are only accountable for what happens at the moment the patient arrives, medicine is accountable for point of care issues, and the like. There is little ability or incentive to coordinate with the previous or next site of care to determine what is necessary.

There is evidence that health care teams, or “high performance teams” as coined by some organizations, are more effective at providing high quality health care.⁹ A study of coordination between formal providers and family caregivers found that an intervention stressing communication quality and supportive relationships, which included mutual respect and shared goals for patient care, was positively associated with patients’ freedom from pain and better functional status and mental health.¹⁰

Barrier/Gap 3: Misaligned Incentives

Our current payment system rewards service volume, such that improving care and care transitions is likely to reduce the number of billable services, resulting in lost revenue for providers. Until providers are rewarded based on outcomes, rather than sheer volume of services, it will be a significant challenge for providers to expend the time and effort required to achieve better transitions of care. HITECH’s \$19 billion for physician offices and hospitals is a step toward payment reform, as they are intended to

⁹ Fried B, Carpenter WR. Understanding and Improving Team Effectiveness in Quality Improvement. In: McLaughlin CP, Caluzny AD eds. *Continuous Quality Improvement in Healthcare: Theory, Implementations, and Applications*. 3rd ed. Sudbury, MA: Jones and Bartlett Publishers Inc. 2006. http://books.google.com/books?id=aVXmoTKNe5UC&pg=PA161&lpg=PA161&dq=%22High+performance+teams%22+and+healthcare&source=bl&ots=SMeWKdleFs&sig=heemzOygC_p8oyz3_eRWc5bubJa0&hl=en&ei=H_ylTijQD4uasAO5nOj-Dg&sa=X&oi=bookresult&ct=result&resnum=6&ved=0CCoQ6AEwBQ#v=onepage&q=%22High%20performance%20teams%22%20and%20healthcare&f=false. Accessed October 1, 2010.

¹⁰ Weinberg DB, et al. Coordination between formal providers and informal caregivers. *Health Care Manage Rev* 2007;32:140-9.

reward providers for meeting objectives related to the five policy priorities set by the HIT Policy Committee:¹¹

- Improve quality, safety, and efficiency, and reduce health disparities
- Engage patients and their families in their health care
- Improve care coordination
- Improve population and public health
- Ensure adequate privacy and security protections for personal health information

Much can be done to move down this path without broader reform. However, achieving the improvement we know is possible will require reform of payment and delivery systems. Payment reform policy gaps not covered by these incentives include the following:

- Including the full continuum of care and a broader sampling of eligible professionals in reformed payment strategies
- Building incentives and supports for consumers/patients/caregivers into policy and offering valid, useful data on quality and cost
- Addressing the high up-front costs accrued by providers and the accompanying unknown or misaligned financial benefits
- Accountability across the continuum for safe, effective transitions of care

As the incentives are currently outlined, there is insufficient accountability for care coordination. Shared goals and incentives that encourage and reward providers and sites to work together are needed. Further, incentives should not only be for process-type measures, but for outcome measures such as improved care, an improved care experience, and hopefully, resulting in improved value and reduced unnecessary care. The outcome measures should include measures of patient experiences and specific measures that apply to care episodes.

[Barrier/Gap 4: Consumer Knowledge and Demand For a Continuing Care Plan](#)

It is recognized that consumers lack incentives to be an active member of the health care team. Unfortunately, most consumers are also woefully unprepared to participate due to lack of information access, poor encouragement from the health care system, incomplete information about actual costs of health care goods and services, and misunderstanding over the roles and responsibilities of each team member, including themselves. While we have seen a strong push in recent years to engage patients

¹¹ Meaningful use matrix. Health Information Technology Policy Committee. Available at http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11113_872719_0_0_18/Meaningful%20Use%20Matrix.pdf, 6/15/2009. Accessed July 1, 2010.

proactively by providing educational materials, patients and their family caregivers often do not know what it is they should be demanding.

Further, health literacy is a challenge when engaging patients and their family caregivers. Health literacy is the “degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.”¹² An Institute of Medicine report, *Health Literacy: A Prescription to End Confusion*, highlighted that ninety million people in the United States have difficulty understanding and using health information.¹³ There is a growing body of literature describing interventions to address low health literacy, including simplified instructions, individually tailored educational information, picture and illustration use, screening for impairments, simulations, and post-discharge followup and support. HIT could be a key improvement to reaching individuals and their caregivers as a method for improving health literacy.

Barrier/Gap 5: Issues of Trust

In order for HIT to be implemented effectively, these systems must be trusted by both the providers who use them and the patients they serve. In addition, there must be clear policy that guides decision making about the access and use of health information, one that can be understood by all stakeholders.

Fears about privacy breaches and misunderstandings of current law have often gotten in the way of broad HIT adoption and appropriate information sharing. Patients may have fears about who can access their information, causing them to opt-out of EMR. The California HealthCare Foundation (CHCF) conducted a survey of adults age 18 years and older about HIT. Among many findings, the survey highlighted several key issues.¹⁴

- Two-thirds of those surveyed are concerned about privacy and security of their health information.
- The majority of those who are using a personal health record (PHR) are not very worried about the privacy of the information (58%).
- Most PHR users and non-users say we should not let privacy concerns stop us from learning how HIT can improve health care.

¹² U.S. Department of Health and Human Services. Health literacy and older adults. Available at <http://www.health.gov/communication/literacy/olderadults/literacy.htm> Accessed October 1, 2010.

¹³ *Health literacy: A prescription to end confusion*. Nielsen-Bohlman L, Panzer AM, Kindig DA. Eds, Committee on Health Literacy. Washington, DC:Institute of Medicine of the National Academies. 2004
http://www.nap.edu/catalog.php?record_id=10883

¹⁴ Udem T. Consumers and health information technology: A national survey. The California Healthcare Foundation. April 2010. Available at:
<http://www.chcf.org/~media/Files/PDF/C/ConsumersHealthInfoTechnologyNationalSurvey.pdf>

- Of those surveyed and not using a PHR, 40% expressed interest in using the technology, and the most identified barrier to using the technology was worry about the privacy of their information.

Additionally, patients and family caregivers are often unable to obtain the information they need, due to a misunderstanding of current privacy rules on the part of their providers. With clear policy and guidance on how to implement that policy, this barrier can be overcome. The level of willingness to make online purchases with sensitive financial information and use e-banking systems is one example of how the right set of policies and effective implementation of them can gain widespread trust among all stakeholders. Patients and providers need multi-faceted and ongoing education on privacy rights, responsibilities, and application of current laws and regulations. Gaps in privacy protection must be addressed and personal health information must be protected regardless of where it resides.

Health care providers need to trust that the information they receive from the system is accurate and the most up-to-date information available. For instance, a medication ordering error that is input at hospital admission could be transmitted to multiple settings and providers and could lead to confusion among providers and patients, delay in treatment, and adverse outcomes. Legislation and practice must ensure the quality of the data entered.

A third related challenge is ensuring information is meaningful and accurate, and available to all members of the health care team, regardless of location, including the patient and family. Cultural and linguistic challenges exist, especially as they relate to patient access to information, but technology can be a powerful tool to overcoming some of these issues. Project Red is one example of using technology in an attempt to overcome linguistic, cultural, and time challenges.¹⁵ Researchers at the Boston University created a robotic “instructor” using avatars that can change their appearance and language based on needs of the patient.

As policy makers move forward to address barriers and gaps related to improving transitions of care, they must aim for a policy framework that:

- Supports common care transition goals
- Improves the quality of care transitions
- Advances the engagement of patients and families
- Requires adherence to clear privacy and security policies
- Encourages more widespread adoption of interoperable technology

¹⁵ Boston University School of Medicine. Project Red. Available at <http://www.bu.edu/fammed/projectred/meetlouis.html> Accessed: July 15, 2010

SECTION IV:

Potential Areas for Improvement Identified by NTOCC

Numerous organizations have recommended changes to the existing system in order to improve transitions of care and the overall care quality while reducing costs. For example, IOM recommended four key strategies for improvement of transitions of care:¹⁶

- Provide educational support, including multi-disciplinary health professions education, teaching of care coordination principles in all health care and academic settings, and development of care teams;
- Institute patient-centered health records, supported by information and communications technology;
- Ensure accountability and define roles for care; and
- Align financial incentives with quality measures.

While these examples highlight primary goals to improve transitions of care, there is little guidance on how to use HIT in ways that specifically improve transitions of care and support the IOM strategies. In this section, NTOCC builds upon the overall recommendations on improving transitions of care and the national agenda as it relates to HIT, and identifies problems and considerations as they relate to the overall goals of NTOCC.

A. Improve communication during transitions between providers, patients, family caregivers, and community supports

1. The Problem

Timely and accurate information transfer across health care settings and to patients and family caregivers is critical for effective transitions. It is rare that the multiple settings and individuals involved in the transitions are part of a connected system of information that includes the patient, his or her family caregiver(s), all providers in all settings involved in the transition, and community resources.

Based on a survey of hospitals in the U.S. in 2009, only 1.5% of those surveyed have a comprehensive electronic record system (i.e., present in all clinical units) and 9.1% overall have a basic system (i.e.,

¹⁶ Adams K, Greiner AC, Corrigan JM. *Eds*, Committee on the Crossing the Quality Chasm: Next Steps Toward a New Health Care System. IOM, 1st Annual Crossing the Quality Chasm Summit: A Focus on Communities. 2004.

present in at least one clinical unit).¹⁷ In 2008 and 2009, the National Ambulatory Medical Care Survey (NAMCS) included with its annual survey of office-based physicians, a supplementary mail survey on EMR/EHR use. The survey found that in 2008, 41.5% of physicians reported using all or partial EMR/EHR systems in their practices, and preliminary estimates for 2009 increased to 43.9%. Fully functional systems were only reported for 6.3% of practices.¹⁸ A recent report of EMR adoption in home health and hospice practice found that in 2007, about 41% of providers had EMRS and 15% planned to adopt them in the next year.¹⁹ Of those using EMR, 98% used components for patient demographics and more than 50% used EMR components for clinical notes, clinical decision support systems, or computerized physician order entry (CPOE). A study based on the National Nursing Home Survey and published in 2009 found that almost all nursing homes (99.4%) had at least one electronic information system, driven by the federally required MDS reporting and for billing.²⁰ Nearly 80% used some type of electronic system for admission, discharge, and transfer, though less than half used systems to support physician order, medical records, laboratory report, and medication administration.

Systems are defined as those that have the following capabilities:

<u>Basic system</u>	<u>Fully functional system (includes basic capabilities)</u>
Patient demographics	Medical history and follow-up
Patient problem list	Test orders
Clinical notes	Prescription and test orders sent electronically
Prescription orders	Warnings of drug interactions or contraindications
Laboratory and imaging results	Highlighting out-of-range test results
	Electronic images returned
	Reminders for guideline-based interventions

There is uneven adoption of HIT across the continuum of care. In addition to wide variances in technology platforms within segments of the care spectrum, there are vast differences in technology across the spectrum. Hospital systems, with a legacy of mainframe and client server architecture, are often a cobbled set of databases and applications that create challenges for reporting and analytics within an organization or hospital system. While the adoption of messaging standards is intended to minimize these issues, the prospect of rapid creation of a complete and useful continuity of care

¹⁷ Jha AK, DesRoches CM, Campbell EG, et al. Use of Electronic Health Records in U.S. Hospitals. *N Engl J Med* 2009;360:1628-38.

¹⁸ Hsiao CJ, Beatty PC, Hing ES, et al. Electronic Medical Record/Electronic Health Record Use by Office-based Physicians: United States, 2008 and Preliminary 2009. Available at http://www.cdc.gov/nchs/data/hestat/emr_ehr/emr_ehr.pdf

¹⁹ Bercovitz A, Sengupta M, Jamison P. Electronic medical record adoption and use in home health and hospice. NCHS data brief, no 45. Hyattsville, MD: National Center for Health Statistics. 2010.

²⁰ Resnick HE, Manard BB, Stone RL, Alwan M. Use of electronic information systems in nursing homes: United States, 2004. *J Am Med Inform Assoc* 2009;16:179-86.

standard, even within the scope as presently specified in this document, is not imminent. This issue is compounded as data is shared between organizations and across platforms.

Health data is intrinsically complex and ambiguous. In addition, there is significant variation within and among health care professionals surrounding assessment and planning processes. So where information exchange occurs, it often lacks a consistent or standard “language.” In other words, the language may relate specifically to the context in which it was created. If not designed properly, HIT may only exacerbate the problem.

Given that patients are the only constant in a care transition, they and their caregivers must have real-time access to the critical pieces of information necessary for smooth, effective transitions of care. Culturally appropriate educational materials to help them understand their health status, goals, and their role in meeting those goals must be shared, as well. HIT can help make these materials easily available in formats and languages that are most meaningful and useful. Currently, patients do not understand the rights afforded them by HIPAA (access to information) and even if they did, an easy method of obtaining access to information is lacking. Family caregivers are often denied access to critical pieces of information as a result of provider misinterpretation of HIPAA.

The internet can be a source of educational materials for patients, however, there are still many Americans that do not access it,—they lack either the knowledge or location necessary to connect. According to a national survey, while 93% of 18-29 year-olds use the internet, only 38% of those age 65 years and older go online. Also, minority populations, lower income households, and those with less education are less likely to have access to the internet.²¹ Yet recent research by the Pew Internet and American Life Project has shown that African-Americans and English-speaking Latinos continue to be among the most active users of the mobile web. Cell phone ownership is higher among African-Americans and Latinos than among whites (87% vs 80%) and minority cell phone owners take advantage of a much greater range of their phones’ features compared with white mobile phone users. In total, 64% of African-Americans access the internet from a laptop or mobile phone, a seven-point increase from the 57% who did so at a similar point in 2009.²² Overall, 55% of Americans wirelessly connect to the internet at least occasionally. Much of the wireless connection is via laptop, though 35% of the adults with cell phones or Smartphones access the internet via their phone.²¹ These findings suggest that various communication modes should be explored for their potential to connect various populations with the health care system.

²¹ Rainie L. Internet, broadband, and cell phone statistics. Pew Internet & American Life Project, January 2010. Available at <http://www.pewinternet.org/Reports/2010/Internet-broadband-and-cell-phone-statistics.aspx?r=1#>. Accessed May 4, 2010.

²² Smith A. Mobile Access 2010. Pew Internet & American Life Project. July 7, 2010. Available at <http://pewinternet.org/Reports/2010/Mobile-Access-2010.aspx>. Accessed September 27, 2010.

2. Issues for Consideration

Issue for Consideration 1: Ensure the Continuum of Care is Represented

Electronic communication will only be effective if all sites within the continuum of care have a way to access the information. At the heart of the continuum are the patients and their families. Policy must ensure that the patient is the focus of the care continuum, and that patients and families have access to care information. Further, HIT policy must clearly outline that the entire continuum of care, including physician office, hospitals, nursing homes, home health care organizations, rehabilitation centers, hospice, and any other health service providers are included in widespread policy changes. Even though all sites and providers are not included in initial stages of recently adopted initiatives, there should be written plans that phase-in implementation of all care sites and providers.

Issue for Consideration 2: EHR Functionality

Applications have focused on supporting point of care needs (documentation, billing, results retrieval) to the exclusion of care coordination. Workflow automation is confined to a specific setting or service (vertically oriented) while transitions of care and service occur across a continuum (horizontally oriented).

EHR products must provide robust support for key functions of care coordination, including:

- Patient preferences and advanced directives
- Sharable and interactive care plans
- Referral tracking: routing, preferred providers, compliance tracking
- Consultants' recommendations: acknowledgement of recommendation receipt, care plan, audit trail plan
- Population-based tracking and quality measurement
- Care manager workflow and alignment with recipient service providers
- PHR linking and other patient specific products/tools
- Medication management and reconciliation

Issue for Consideration 3: Structural and Administrative Governance

The structure and function of information governance is evolving rapidly. Health Information Organizations (HIOs) and Regional Health Information Organizations (RHIOs) seek to facilitate a health information exchange (HIE) by addressing national standards and to govern how HIE will take place.

Meaningful HIE is not yet a significant reality nationally, and where it exists, there is still no consensus on HIE models or missions.

One way to get HIE initiated is to implement a minimum set of data elements considered necessary in transitions that is standardized electronically. The American College of Physicians and other stakeholder medical organizations drafted a policy statement on transitions of care and the minimum set of data elements that should always be part of a transitions record. The ideal transition record includes the following:²³

- Principal diagnosis and problem list
- Medication list, including over the counter (OTC)/herbals, allergies, and drug interactions
- Clear identification of medical home/coordinating physician and contact information
- Patient's cognitive status
- Test results/pending results and normal value ranges and explanation for patients
- Emergency plan and contact number and person
- Treatment and diagnostic plan
- Prognosis and goals of care
- Advance directives, power of attorney, consent
- Planned interventions, durable medical equipment, wound care, etc
- Assessment of family caregiver status

Further, patients and their family caregivers must receive, understand, and be encouraged to participate in the development of the transition record, which should take into consideration the patient's health literacy, insurance status, and be culturally appropriate.

Issue for Consideration 4: Interoperability and Infrastructure

HIT must be enabled to export patient data to external systems and providers *in a meaningful and succinct format*. For example, there are two different care coordination documents included in the interim final rule: the Continuity of Care Document (CCD) and the Continuity of Care Record (CCR). CCD is intended for exchange between professionals, and the CCR for transmission to personal health records and consumer platforms. The documents contain a core data set of the most relevant administrative, demographic, and clinical information about a patient's health care. While neither document has been universally adopted, nor are they compatible with each other, they do provide a

²³ Snow V, Beck D, Budnitz T et al. Transitions of care consensus policy statement American College of Physicians-Society of General Internal Medicine-Society of Hospital Medicine-American Geriatrics Society-American College of Emergency Physicians-Society of Academic Emergency Medicine. J Gen Intern Med 2009;24:985-7.

framework for communication between settings, providers, and patients. A continuity of care standard is needed.

- **Succinct Format:** data must be presented in a manner that can be quickly integrated into downstream IT systems in private and secure ways and have highly targeted, tightly-organized information specific to the clinical scenario. This will likely require a number of templates to address the spectrum of patient situations. The information needed for a patient returning from the hospital to a long term ventilation facility differs widely from data relevant to a patient returning to his/her primary care physician following joint replacement surgery, for example.
- **Content:** EMRs are often filled with out-dated, redundant, or irrelevant information. HIT systems must be designed in ways that filter out redundant and outdated information. Engaging patients and their families is also a critical element of ensuring accurate information, so providing them with access to their own information is a vital part of ensuring the accuracy of information. Given that they are the primary individuals who identify errors in medical records, there must be a clearly articulated means of flagging and correcting erroneous data and information.

The effectiveness of HIT in improving care transitions is dependent on the ability to link data from various sources, which requires technological “mapping” of where key pieces of information can be found. Currently, data is mapped within systems through proprietary processes, and gaps in data mapping are handled in idiosyncratic ways. As we begin to achieve a national health information strategy, these issues must be addressed in a way that ensures data from various sources is connected accurately and effectively so that the information made available during care transitions is reliable and valid. Further, there must be built in monitoring of the systems to ensure they are operating as intended or can be modified as situations change.

Issue for Consideration 5: Standardized Processes and Performance Goals Related to Transitions of Care

While some elements of facilitating care transitions might best be left to individual providers to design, the safety and effectiveness of care transitions requires some degree of standardization among providers to ensure the completion of critical activities common to all transitions of care. At a very basic level, there should be a list of key pieces of information to be conveyed to the next care site for every care transition. These standardized processes can be used to develop measures that will indicate provider performance in facilitating safe, effective transitions of care. Ultimately, there should be cross-cutting measures to indicate better outcomes resulting from better coordination among providers during a care transition.

Issue for Consideration 6: Foster Innovation and Adoption of Various eTools by All Stakeholders

Once information is made available, it must be made meaningful and actionable in order to contribute to better care outcomes. A variety of tools exist that can be used by health care providers, sites, and patients and their families to put health information into action. Policy must be designed to foster both innovation and adoption of these tools so they meet the needs of the intended users of information. Information must be accessible to patients in ways that enables and engages them to use specific technologies (i.e., desktop computer, laptop, mobile phone, etc.) and tools (applications) to which they have the greatest access. This may be web access, but could also include cellular phone and smart phone applications, or other novel devices or means.

Ultimately, technologies used to convey information necessary for safe, effective care transitions will need to be responsive to stakeholder needs and have the ability to receive information from the patient, such as input from a PHR or mobile device. HIT that helps connect the various individuals involved in a transition of care, including the patient and his or her family caregivers, will likely increase the success of the care transition.

B. Develop standardized processes for transitions, including medication reconciliation

1. The Problem

To ensure safe care transitions, standard transition processes must be in place. Unfortunately, standard processes are generally lacking in rigor, do not include policies and procedures to make processes enforceable, and simply are not rewarded. Medication reconciliation is one such task that is critical to safe transitions. Medication reconciliation is the process of creating the most current, complete, and accurate list possible of a patient's medications, comparing that list against other medication lists at transitions in care, and resolving any discrepancies. Medication reconciliation can be assessed as a static event (i.e., performance documentation by signature and completion of a medication reconciliation form) and by detecting errors that occurred during the process (i.e., medication discrepancies resolved). These processes address the Joint Commission's National Patient Safety Goal on medication reconciliation.

NTOCC recognizes that medication reconciliation can be facilitated by HIT. Schnipper et al. recently demonstrated a reduction in unintentional medication discrepancies using IT in conjunction with a medication reconciliation process redesign, compared to no IT support.²⁴ While IT seems to be a

²⁴ Schnipper J, Hamann C, Ndumele CD, et al. Effect of an Electronic Medication Reconciliation Application and Process Redesign on Potential Adverse Drug Events. *Arch Intern Med* 2009;169:771-80.

necessary tool for successful medication reconciliation, the investigators did identify several issues that diminished IT's full potential:

- Incomplete and inaccurate electronic sources of ambulatory medications
- Lack of patient and caregiver knowledge about preadmission medication regimens
- Lack of clinician adherence with the reconciliation process
- Software usability issues
- Lack of consistent claims data access
- Lack of ability to track OTC medications

Additional lessons about the usefulness of HIT to medication reconciliation come from the Veterans Administration (VA). The VA implemented a self check-in kiosk and reconciliation tool in an attempt to improve the accuracy of the medication history by showing patients digital pictures of their medications on record and to minimize the effects on workflow. The initial observations, published in 2009, included the following:²⁵

- Patients with little or no computer experience can use an electronic kiosk
- Kiosks were used sporadically by patients, due to clinicians who chose competing demands over reconciliation
- The fragmentation of health information systems prevented matching medication pictures to non-VA prescription medications
- Adding testing to include accuracy, reliability, and interoperability are underway at other VA centers

These examples indicate that HIT solutions can be effective, even with the most novice of users. However, provider commitment is key to the success of transitioning to a more patient-centered health care environment enabled by technology. HIT can help foster this commitment by making the process of providing the care patients need simpler and more efficient than it is today. For this to happen:

- Interoperability must improve to ensure that information is accurate
- Emphasis must be placed on connecting the various sources of clinical data in order to reduce the reliance on claims data, which is significantly limited in its usefulness in the clinical setting
- Accountability for these critical processes is necessary and can be developed by aligning incentives
- Constant feedback from the technology users to the marketplace is necessary in order to foster innovation and constant improvement in the responsiveness and effectiveness of available products

²⁵ Lesselroth BJ, Felder RS, Adams SM et al. Design and implementation of a medication reconciliation kiosk: the Automated Patient History Intake Device (APHID). *J Am Med Inform Assoc* 2009;16:300-4.

- Patient and family caregiver engagement at every care encounter is essential in order to improve patient knowledge and understanding of their medication regimens
- A standardized nomenclature is necessary for the smooth exchange of information between organizations, within the same organization, and with patients and their families

Efforts made to standardize processes related to care transitions must accommodate and support team-based care. Medication reconciliation can be performed by various members of the care team, including nurses, nurse practitioners, pharmacists, and physicians. If an institution requires electronic medication ordering, it should develop specific instructions for the multidisciplinary team members to assure an effective and reliable medication reconciliation process. An example of one health system's process is available at <http://www.legacyhealth.org/body.cfm?id=1878>.

2. Issues for Consideration

Issue for Consideration 1: Minimum Set of Standardized Data Elements

The form and system used to record admission medications, whether paper or electronic, should include a minimum set of data elements. NTOCC has developed a list of suggested common/essential data elements for medication reconciliation.

The essential elements as outlined by NTOCC for medication reconciliation include basic demographic information, caregiver information, and an active medication list (including over-the-counter and other nutritional supplements/herbals, etc), that includes dosing information, reason for use, and expected duration of use, and patient access to medications (e.g., how they get their medications and who pays for them). The full list of elements can be found in Appendix B or at <http://www.ntocc.org/>.

Issue for Consideration 2: Adjudication and Timing

For patients with complex illnesses, the transfer between multiple providers and care settings requires an adjudicating mechanism to determine:

- How the new information compares with the old
- The accuracy and relevance of the received information
- The priority of the information, and to whom the priority belongs
- The timing of the new information, with a crucial emphasis on timing that requires follow-up

In most workflows, adjudication (i.e., a decision about which information is current and accurate) is done manually, is not standardized, and is dependent on the timing and specificity of distributed information receipt. For hospital discharges, this information may not come to the primary care practice

until after the follow-up appointment is complete, so that when it does arrive it can no longer be adjudicated against the current information. For machine-enabled adjudication, the specific characteristics noted above must be specified. There must be a standard process for adjudication and timing built into the HIT system.

Issue for Consideration 3: Built-in HIT System Monitoring

HIT systems must have built-in quality assurance monitoring protocols to ensure they are working as intended, and that they are not creating unintended problems. Leapfrog Group, in their hospital survey of computerized physician order entry (CPOE) systems, discovered that that almost one-third of tested orders that might have resulted in fatalities went undetected, and hospitals that repeated testing improved their performance.²⁶ Monitoring protocols that ensure transitions of care HIT components must be required under meaningful use to ensure that HIT is actually performing as intended.

C. Establish Points of Accountability for Transitions of Care for Both Sending and Receiving Actions

1. The Problem

Providers must have accountability for sending and receiving information about patients during care transitions. Given the high number of professionals potentially involved in a single episode of care, each team member must have a clearly defined role. Accountability should not be specific to a particular disease state or a particular group of patients, but for all patients moving within the health care system. Several models of care have been implemented or promoted in an effort to improve patient-centeredness and accountability.

The emergence of hospital specialists or skilled care specialists (i.e., SNFists) in the system has further exacerbated the difficult task of maintaining the sending and receiving accountability.

2. Issues for Consideration

Issue for Consideration 1: Identify Expectations for Accountability

As previously discussed, interoperability is critical to ensuring all necessary parties have the information they need at the point of care. The ability for health care software applications to produce and consume

²⁶ Leapfrog Group. Good First Step, But Grave Concerns. Statement by Leah Binder, CEO, The Leapfrog Group. Available at http://www.leapfroggroup.org/news/leapfrog_news/4779269. Accessed September 29, 2010.

the continuity of care standard will be a major step forward in providing information to support care planning and reduce errors of omission, but that functionality alone will not solve issues in coordination of care and service and in some ways may increase the risk of errors of commission. Even after technological interoperability is improved, accountability processes need to be in place. There must be a formal process defining expectations for responsible parties and ensuring each individual in the process understands his or her role for the care episode.

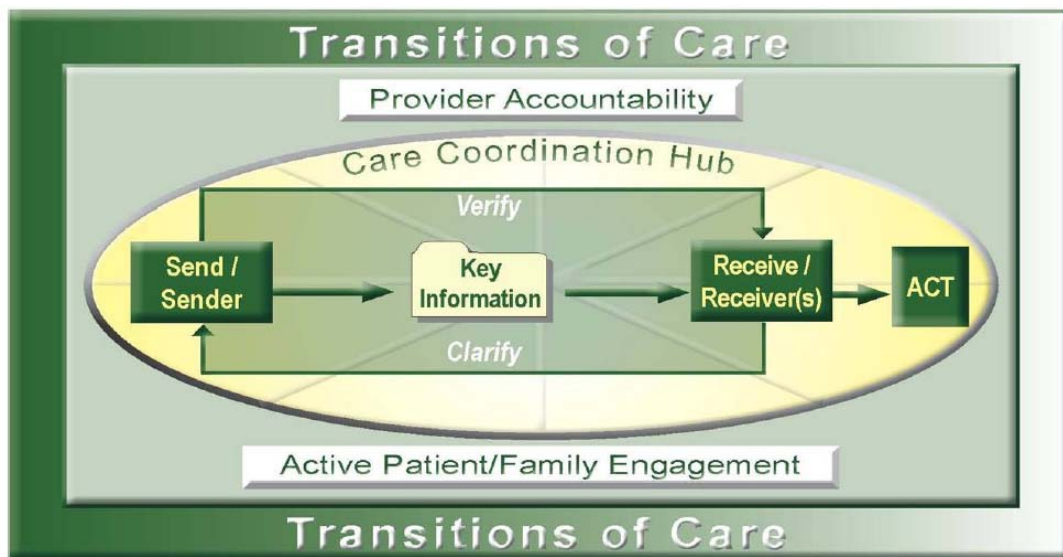
Issue for Consideration 2: Crosscutting Quality Measures Documenting Completion of Sending and Receiving Responsibilities

The care transition process measures can be conceived as a paired set of measures for both the sender and the receiver of critical information for transitions. For patients with complex care needs, the responsibility of crucial elements that need followup is not well defined in most HIT systems; two-way communication to denote acceptance or recognition of plans of care is important to clearly establish who is responsible for completing certain elements of the care plan. This is also important to help patients and their families understand their role in ensuring the success of the care transition and whom they should contact if there are problems during the transition. The sender is accountable for ensuring that the key information transferred to the receiver is accurate and timely and for verifying that the information was received by the intended recipient. The receiver is accountable and must acknowledge the receipt of complete information from the sender in a timely manner. The sender should be available to clarify or answer any questions that the receiver may have regarding the information received. Moreover, the receiver should act upon the information received—that is, to evaluate the information and determine whether the plan of care should be altered before continuing its implementation and, if so, in what way. Ultimately, the goal is that the critical information be exchanged such that the plan of care is continued seamlessly.

Information transfers must be as complete, accurate, and timely as possible. Timely means that the transfer of information from one care setting or provider to another must occur in a time frame appropriate for the receiving provider to assume responsibility for the patient's care. Such handover must take place during an interval that allows the receiver enough time to anticipate the patient's encounter and to plan effective implementation of the care plan or any needed intervention/ modification. The sender and receiver must make every effort to adhere to pertinent nationally/internationally recognized standards when defining what "timely" means. These standards may include quality, patient safety, regulatory, and accreditation standards. The care transition-based interaction(s) between the accountable providers of care (i.e., both the sender and receiver of information) occurs in a "**care coordination hub**" context with the primary aim of ensuring effective and

safe transition of care between care settings and/or providers. HIT can be instrumental for documenting sending and receiving actions.

While the concept of patient-centered medical home incorporates such a “hub,” Stepping up to the Plate (SUTTP) recommends the independent advancement of this notion, rather than waiting for the medical home concept to be operationalized. Integral to this “care coordination hub” is active involvement by the patient and family. The sender, especially, is expected to educate the patient and family about the necessary care transition activities, answer their questions, and seek their active participation in the decisions about the transition. Assessing the effectiveness of the care transition process requires actually asking the patient and their family members—the only consistent actors throughout the care transition—about their experience. Therefore cross-cutting outcome measures of performance in this area should include patient experience of care measures.



D. Increase the Use of Case Management and Professional Care Coordination

1. The Problem

Another important element in a successful transition of care is case management or other professional care coordination. Case managers are health care professionals responsible for providing patient assessment, treatment planning, health care facilitation, and patient advocacy.²⁷

Case managers often navigate through the maze of health care resources, communication, and services needed by patients. Care coordination has resulted in positive outcomes for both patients and their caregivers. For example, many of the programs for older adults that include care coordination have produced positive patient outcomes, such as improved functional ability, reduced hospital admissions, and fewer nursing home placements. Care coordination has been shown to reduce the unmet needs of community-dwelling older adults.^{28,29}

For example, hospital days for patients participating in the Wisconsin Partnership Program decreased from five days per year per thousand clients to 2.1 days,³⁰ and reduced hospital utilization also has been reported in four other programs.^{31,32,33,34} Similarly, five programs reduced the length of nursing home stays.³⁵ Moreover, a social work-based care coordination program for older adults at Rush University Medical Center demonstrated success in helping recently discharged patients link with needed community services, manage care responsibilities, and implement discharge recommendations.²⁹

²⁷ Case Management Society of America, CMSA & Case Managers, available at <http://www.cmsa.org/Conference/tabid/244/default.aspx>.

²⁸ JB Christianson, The Evaluation of the National Long Term Care Demonstration: The Effect of Channeling on Informal Caregiving. *Health Services Research* 1988;23:99-117.

²⁹ American Hospital Association. (2010) Social workers enhance post-discharge care for seniors (Hospital in Pursuit of Excellence Case Study). Available at <http://www.hpoe.org/PDFs/case%20study--rush.pdf>. Accessed June 4, 2010.

³⁰ Mollica R, Gillespie J. *Care Coordination for People with Chronic Conditions*, Partnership for Solutions, Johns Hopkins University. January 2003.

³¹ Chatterji Pet al. Evaluation of the Program of All-Inclusive Care for the Elderly Demonstration: Final Report, Abt Associates, Inc. (2000).

³² S Anthony, et al. Medicaid Managed Care for Dual Eligibles: Case Studies of Programs in Georgia, Minnesota, and Pennsylvania, The Kaiser Commission on Medicaid and the Uninsured. July 2001.

³³ Cadiz D. Social Work and Care Coordination in VA: The Right Care at the Right Time in the right Place, presented at The New York Academy of Medicine Toward New workforce Strategies in Care for the Aging Conference. Oct. 19, 2005.

³⁴ Engelhardt JB et al. Long-Term Effects of Outpatient Geriatric Evaluation and Management on Health Care Utilization, Cost, and Survival, *Research on Social Work Practice* 2006;16: 20-7.

³⁵ Leutz WN et al. Utilization and Costs of Home and Community-Based Care within a Social HMO: Trends Over an 18-Year Period, *Int J Integr Care* 2005; 5:1-14.

2. Issues for Consideration

Effective care coordination requires timely transfer of information from the care setting to the care manager. Discharge summaries are notoriously slow and often not adequate to support needs. HIT can be a very effective tool for making care managers' interventions and communications available to those who need access to that information. This requires that all members of the care team have access to the technology, that its design accommodates their work flows, and that the information they contribute is documented in a standard way. This will easily allow incorporation of new information into the medical record or transmittal to other clinicians.

Issue 1: Workflow

Current electronic system designs focus on physician workflow without considering the needs of other care team members. A common workflow pathway, such as a centralized task management list for transitions, with functions of responsibility, timing, priority, and completion, could be a simplified mechanism to share information, and HIT offers opportunities to ensure that this is standard. Further, the interdisciplinary team should adopt a national standard for documenting a plan of care for the consumer that is promoted by a central resource, such as a case manager. URAC'S national Case Management Standards provide such guidance on comprehensive assessment, inclusive of transitions of care and medication reconciliation with the interdisciplinary care team, family caregivers, and patients. Expected workflows for care coordination and how HIT can facilitate these workflows must be identified. Once identified, new products making their way to the marketplace must facilitate these workflows.

E. Expand the Role of the Pharmacist in Transitions of Care

1. The Problem

Many transition of care problems relate to the safe and effective use of medications. HIT has the potential to reduce the rate of medication related problems and improve the rate and accuracy of reconciled medication lists between providers. Pharmacists have an integral part in establishing a smooth transition of care and can provide expertise in a patient's drug therapy regimen. Case managers can help patients navigate to community pharmacists for optimal medication management that can assist prescribers and patients managing complex medication schedules. Appropriate medication management promotes medication compliance and helps avoid unnecessary health care utilization.

2. Issues for Consideration

Issue 1: Inclusion of Pharmacists as Meaningful Use Eligible Providers

The American Pharmacists Association (APhA) wrote to the ONC about their position on the draft Recommendations for Meaningful Use of EHRs in June 26, 2009. APhA commented that the pharmacy contributions to “Meaningful Use” in improving care coordination should, “Enable efficient medication reconciliation performed by a pharmacist using harmonized and interoperable data that provides the most comprehensive view of the patient’s medication history.” As currently written, pharmacists are not defined as eligible professionals in the meaningful use criteria.

Issue 2: Pharmacist Communication (i.e., counseling and education) With the Patient and Caregiver

While HIT systems provide an efficient method of compiling a medication list, medication reconciliation is a complex process that must include information verification by an accountable pharmacist with the patient. Medication reconciliation within the scope of care transitions cannot fully depend on HIT for all communication regarding medications.

F. Implement Payment Systems That Align Incentives and Include Performance Measures to Encourage Better Transitions of Care

1. The Problem

There is a lack of consistent performance metrics under pay-for-performance models. Our health care system reimburses far more highly for procedures rather than cognitive skills, patient education, and preventive services. To truly foster better care coordination and support technology implementation, concepts such as the medical home and care coordination models need redesigned reimbursement methods.

2. Issues for Consideration

Issue 1: Bring Additional Health Care Settings and Professionals Into the Electronic Environment Through Policy Levers

Future policy should be designed to phase-in health care settings and professionals not considered eligible providers by current legislation. This would allow for more accountability among settings and providers and professionals of all types. Further, policy must implement cross-cutting measures and use them to hold all providers and professionals accountable (such as through accountable care organizations (ACOs) and other payment models) for the quality of care transitions.

Issue 2: Routinely Assess Patient Care Experience

There is evidence that use of simple patient experience measures (e.g., CTM-3) can accurately describe the effectiveness of communication with patients and family caregivers. Guidance should be strengthened on how to expand the use of patient experience measures, when such tools should be used, and how the results of such measures can be used to improve the transition of care process. Policy should focus on strengthening the ability of patients and caregivers to assess experiences specific to care transitions in all settings. Patient satisfaction information should be used as part of quality assessment for new payment models that reward safer, more effective care transitions and coordination of care.

SECTION V.

Conclusion

Improving transitions of care using health information technology is an ambitious goal that requires cooperation on the part of numerous stakeholders. NTOCC suggests that stakeholders work collaboratively to address the following issues:

- Need for standards, both relative to technology (interoperability) and transitions of care processes (best practices)
- Requisite quality measures that reflect process standards and expected outcomes of successful transitions, including patient care experience
- Lack of real incentives for sharing information between and among all care settings, based on accountability for sending and receiving information, as well as the ultimate outcomes of transitions of care
- Opportunities to promote team-based care, both within and across providers, by involving case managers and pharmacists

Appendix A. Glossary

ACO or Accountable Care Organization:

networks of physicians and other providers that could work together to improve the quality of health care services and reduce costs for a defined patient population.

ARRA or American Recovery and Reinvestment

Act of 2009: law passed in February 2009 in direct response to the economic crisis. The portion of the law related to advancing health information technology is the Healthcare Information Technology for Economic and Clinical Health (HITECH) Act, defines a timetable and expectations for how hospitals must demonstrate meaningful use of certified HIT. The Act ties incentive payments (and ultimately reimbursement reductions) to the physician adoption and use of certified, connected electronic health records.

CCD or Continuity of Care Document: content that summarizes a consumer's medical status for the purpose of health information exchange developed by ASTM and HL7. The patient summary contains a core data set of the most relevant administrative, demographic, and clinical information facts about a patient's health care, covering one or more health care encounters and provides a means for one health care practitioner, system, or setting to aggregate all of the pertinent data about a patient and forward it to another practitioner, system, or setting to support the continuity of care.

CCR or Continuity of Care Record: The patient specific health record standard developed by ASTM International, the Massachusetts Medical Society, the American Academy of Family Physicians, the American Academy of Pediatrics,

and the Health Information and Management Systems Society (HIMSS).

CCHIT or Certification Commission for Healthcare Information Technology:

Founded in 2004, this nonprofit group established the first comprehensive, practical definition of what capabilities were needed for EHR systems. The certification criteria were developed through a voluntary, consensus-based process engaging diverse stakeholders, and the Certification Commission was officially recognized by the federal government as a certifying body

CPOE or computerized physician/provider

order entry: providers use of computer's assistance to directly enter medical orders (e.g., medications, consultations with other providers, lab services, imaging studies and other auxiliary services) from a computer or mobile device. The order is also documented in a digital, structured, and computable format for use in improving safety and organization.

EHR or electronic health record: An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.

EMR or electronic medical record: An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.

HIE or health information exchange: The electronic movement of health-related information among organizations according to nationally recognized standards

HIO or Health Information Organization: An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.

HIT or health information technology: The application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making

HITECH or the Health Information Technology for Economic and Clinical Health Act: The portion of ARRA related to advancing health information technology

HITSP or Health Information Technology Standards Panel: The panel created by the ONC to establish standards that will allow computer systems and applications to communicate with each other.

Meaningful EHR user: an eligible professional or eligible hospital that, during the specified reporting period, demonstrates meaningful use of certified EHR technology in a form and manner consistent with certain objectives and measures presented in the regulation. These objectives and measures would include use of certified EHR technology in a manner that

improves quality, safety, and efficiency of health care delivery, reduces health care disparities, engages patients and families, improves care coordination, improves population and public health, and ensures adequate privacy and security protections for personal health information.

NHIN or National Health Information Network: A national network designed to link state and regional health information exchanges to each other in a secure manner.

ONC or Office of the National Coordinator: A short-hand term for the Office of the National Coordinator for Health Information Technology, which was created in 2004 to manage the federal government's activities in developing standards for computer systems involved in health information technology and to encourage the exchange of information.

PHR or Personal Health Record: An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and can be drawn from multiple sources while being managed, shared, and controlled by the individual.

RHIO or Regional Health Information Organization: A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchanges among those stakeholders to improve health care in that community.

Appendix B. Medication Reconciliation Essential Elements



Medication Reconciliation Elements

Suggested Common/Essential Data Elements for Medication Reconciliation

ASSESSMENT ON A ACCESS TO CARE SETTING (E.G. HOSPITAL ADMISSION, NURSING HOME ADMISSION)				
Category	Element	Source(s)	Barrier(s)	Comments
Demographic	Name	Patient/caregiver	Cognitive status	Universally available unique identifier information
	Date of birth			
	ID Number			
	Gender			
	Contact information			
	Care giver name and contact information	Care giver	Care giver knowledge of patient	
	Allergies/intolerances	Patient/caregiver		
	Date of assessment	Interviewer		May also include time of transport of info
Medications (active, taken chronically)	Name – generic/trade	Patient/caregiver	Patient/caregiver knowledge of complete medication list, cognitive status	NDC will be used in automated systems – name + dose
	Dose			
	Form			
	Frequency			
	Reason for use			
Other medications/OTC/herbal remedies/nutritional supplements/time-limited medications	Name – generic/trade			Stop dates for short term medications
	Dose			
	Form			
	Frequency			
Other elements for consideration				
Demographic	Primary language	Patient/caregiver	Patient/caregiver knowledge of complete medication list, cognitive status	Variety of methods to provide info on compliance
	Religious, cultural factors			
Medications	Prescriber			
	Compliance level			
Medical history	Known medical conditions			To be able to identify conditions that may not be treated
Primary health care provider	NPI#			

Category	Element	Source(s)	Barrier(s)	Comments
Patient access to medications	Prescription benefits, out-of-pocket costs, public and manufacturers' pharmaceutical assistance programs, patient/caregiver access to pharmacy (e.g., in rural areas or in neighborhoods where pharmacies won't carry certain drugs, such as pain medications)	Patient/caregiver, health care setting personnel	Patient/caregiver lack of knowledge regarding, or difficulty navigating, benefit plans or programs, lack of patient/caregiver financial resources, gaps in public and manufacturers' pharmaceutical assistance	To ensure patients will be able to obtain prescribed medications.
ASSESSMENT/RECONCILIATION ON TRANSFER OF CARE				
Medications (to be continued at home, in long term care facility, etc.)	Name – generic/trade	MAR, health care setting personnel, physicians orders, universal order sheet	Incomplete documents, missing information, poor communication among care providers	Transfer information can serve as admission information on subsequent access to care. For home care or other self care setting, should include a plan to enhance adherence.
	Dose			
	Form			
	Frequency			
	Reason for use			
Expected duration of use (chronic, time limited)			Assign specified duration of use as appropriate for selected medication (e.g., end date, number of days). Examples include high risk medications such as anticoagulants following surgery, antibiotics, and steroids	
Ability to self medicate	Patient/caregiver		Patient/caregiver should be able to reconcile new medication list with previous list if self medicating at home	
Allergies/intolerances				
Validation	Name/date/signature	Health care provider, other	Poor coordination of transfer, provider/other not available to validate	Person taking responsibility for accuracy of list on transfer and communication with patient and caregivers

Acknowledgment

NTOCC wishes to acknowledge and thank the following individuals for their contributions to this paper:

Leah Binder, MA, MGA
Chief Executive Officer
The Leapfrog Group

Mark Brueckl, R.Ph.
Assistant Director of Pharmacy Affairs
Academy of Managed Care Pharmacy

H. Edward Davidson, PharmD, MPH
Asst. Professor Clinical Internal Medicine
Insight Therapeutics, LLC

David Dorr, MD, MS
Assistant Professor
Oregon Health & Science University

Mary Fermazin, MD, MPA
Vice President, Health Polity and Quality Measurement
Health Services Advisory Group

Jean Paul Gagnon, PhD
Senior Director
US Policy and Strategic Advocacy
sanofi-aventis

Cheri Lattimer, RN, BSN
CMSA Executive Director
NTOCC Project Director

Christine G. Leyden, RN, MSH
Senior Vice President & GM Client Services
Chief Accreditation Officer
URAC

Dan McKean
Business Development and Vendor Relations Manager
TransforMed

Eva Powell
Director, Health Information Technology Project
Of The National Partnership for Women & Families

William Russell, MD
VP Clinical Information
Erickson Retirement Communities

Shannon Sims, MD, MPH
Director of Clinical Informatics in Performance
Improvement, Rush University Medical Center

Fikir Tilahun
Manager, External Affairs
sanofi-aventis

Debbie White
CMI Coalition Coordinator for NTOCC

Victoria A. Wicks
Vice President, External Affairs
sanofi-aventis U.S.

This document was prepared with the assistance of Lisa Han, MPH, and H. Edward Davidson, PharmD, MPH, of Insight Therapeutics, LLC.