Health Project

Transforming Health Care: The Role of Health IT

Bipartisan Policy Center Task Force on Delivery System Reform and Health IT

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Led by Bipartisan Policy Center (BPC) Health Project co-leaders and former Senate majority leaders Tom Daschle and Bill Frist, and including a broad range of nationally respected experts and leaders from many sectors of health care, the Task Force on Delivery System Reform and Health Information Technology was created to focus on two primary goals:

- Identify real-world examples and best practices that facilitate coordinated, accountable, patient-centered care; and
- Make recommendations for ensuring that current health information technology (IT) efforts support delivery system and payment models shown to improve quality and reduce costs in health care, in ways that best utilize scarce public and private resources.

The task force spent six months working collaboratively to forge consensus around a set of recommendations for the most effective use of health IT dollars to support new models of care that improve quality and health, and reduce costs. These recommendations are grounded in a review of the literature and interviews with leaders of nearly 40 high-performing organizations (see Appendix).

This report presents the task force's findings and recommendations.

Executive Summary

Health information technology (IT) plays a critical role in supporting new models of care and payment that are designed to achieve health care's triple aim: improve health, improve the experience of care for patients and families, and reduce the cost of care. Despite the introduction of IT to nearly every other aspect of modern life, the U.S. health care system remains largely paper-based. Greater use of health IT enjoys bipartisan support.

The authorization of up to $30 billion to support health IT under the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 has spurred significant private sector investment to further increase the use of health IT. Most of these funds are for the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs, known informally as "Meaningful Use," that reward clinicians and hospitals when they use EHRs in specific meaningful ways to improve care.

Studying the common attributes of the nation's highest performing health care organizations can help shape public policy and investment decisions regarding health IT. The task force has identified six such attributes:

1. An organization-wide focus on the needs of the patient
2. Strong organizational and clinical leadership
3. Access to information to support efficient, coordinated care
4. Timely access to care
5. Emphasis on prevention, wellness and healthy behaviors
6. Accountability, alignment of incentives, and payment reform

There remain several gaps in and barriers to achieving the health IT capabilities needed to support these common attributes of high performance and new models of care:

1. Misaligned Incentives

New models of care, supported by the health IT capabilities required for their success, will not become the norm without transforming the nation's primarily volume-based payment model to one that promotes higher quality, more cost-effective care.

2. Lack of Health Information Exchange

While the exchange of information across the multiple settings where care and services are delivered is a central and necessary component of coordinated, accountable and patient-centered models of care, the level of health information exchange in the U.S. is extremely low.

3. Limited Level of Consumer Engagement Using Electronic Tools

Health IT plays a critical role in supporting patient-centered care, yet use of electronic tools to coordinate care, drive provider-patient communication, and empower patients to manage their health and health care is not widespread.

4. Limited Levels of EHR Adoption

While EHRs are a necessary foundational component for new models of care, the level of EHR adoption and Meaningful Use among physicians, hospitals and other provider organizations remains low.

5. Privacy and Security Concerns

Consumers expect that their health information will be kept private and secure. Solidifying public trust in health IT and electronic health information exchange initiatives will require assurance about the processes used to protect the privacy and security of health information.

6. Multiple Federal Priorities Require Focus and Attention

Health care organizations are faced with numerous requirements associated not only with health IT, but also with delivery system and payment reforms, health care coverage and access challenges, administrative improvements, and program integrity brought about by

the Patient Protection and Affordable Care Act (ACA) of 2010, HITECH and other federal, state and private sector programs.

To address the gaps and barriers described above, and to accelerate the most effective use of health IT resources in support of the triple aim, the task force makes the following recommendations:

1. Align Incentives

Federal, state and private sector purchasers and health plans should align incentives and payment with higher quality, more cost-effective health care, along with the health IT-enabled, coordinated, accountable, patient-centered care delivery models that support such outcomes. These new models require the exchange of standards-based data across the multiple organizations in which care and services are delivered, expanded engagement of consumers using electronic tools, as well as other current requirements of Meaningful Use. Public and private sector pilot programs designed to implement and evaluate new models of care should continue and accelerate.

2. Accelerate Health Information Exchange Efforts

Because health information exchange plays a critical and central role in delivering coordinated, accountable, patient-centered care for achieving the triple aim, several steps must be taken to promote access to health information for care teams and patients.

Stage 2 of Meaningful Use, along with related standards and certification criteria, should support and promote both the transmission of and access to standards-based data that reside across the multiple settings in which care and services are delivered. The federal government should collaborate with the private sector to develop a long-term strategy and plan to support the data needs associated with delivering care, empowering patients and improving population health. This plan, to be implemented within a policy framework, should be based on health and health care priorities. It should include the data content, transport, vocabulary and terminology standards needed for the exchange of health information across settings and a timeline for their evaluation and adoption.

In the near term, private and public sector leaders should agree on and accelerate the execution of a common set of principles, policies and technical methods for the exchange of standards-based, discrete data to support coordinated, accountable, patient-centered care. This work should be based on an assessment of lessons learned from existing health information exchange efforts, incorporate the perspectives of a broad and diverse range of stakeholders, and leverage the considerable work that has already been done through multiple private and public sector efforts.

Federal policymakers, working with industry and consumer stakeholders, should ensure the prompt development and implementation of a national strategy for improving rates of accuracy in matching patients to their health information.

3. Accelerate and Support Engagement of Consumers Using Electronic Tools

Both the public and private sectors should expand consumer awareness of the benefits of electronic tools and the steps that consumers can take to protect their privacy in online communications. Beginning in 2012, the private sector, in collaboration with the public sector, should develop and implement training and educational programs to help providers use online and electronic tools to support consumer access to their health information, improve communication and coordination between patients and their care teams, and support self-care. Tools that support the easy import and export of health

information into and from consumer-facing applications should be developed and made widely available. Consumer-mediated health information exchange methods should be explored through pilots.

4. Expand Education and Implementation Assistance

The private sector, in collaboration with government, should rapidly develop and implement mechanisms for sharing best practices and strategies for addressing challenging issues associated with Meaningful Use – including those related to clinical quality measurement, clinical decision support, computerized physician order entry, and public health surveillance reporting.

Vendors and providers should collaboratively identify and execute strategies to improve usability and safety of health IT systems.

The federal government should encourage and support the development and widespread dissemination of basic, "common-sense" security practices, including procedures that help providers comply with the Health Insurance Portability and Accountability Act of 1996 (HIPAA) Security Rule.

Learning from federally funded programs such as the regional extension center program, the private sector should further expand the level of support by rapidly developing and implementing training and implementation assistance programs, with a particular focus on small physician practices and community hospitals and clinics that deliver care to rural and underserved communities.

To inform and accelerate successful implementation in the field, the federal government should rapidly share with the public outcomes, lessons, tools and evaluation results from all federally funded programs that leverage IT to improve health and health care.

5. Address Concerns About Privacy and Security

The administration should consistently issue comprehensive and clear guidance on compliance with federal privacy and security laws covering personal health information. Such guidance should address access, use and disclosure of health information for treatment and public and population health purposes, and be consistent in approach across multiple agencies. State governments should also provide this guidance with respect to state health privacy laws.

All entities that access, use and disclose consumers' personal health information should be required to comply with privacy and security requirements that are at least as comprehensive as those applicable to entities covered under HIPAA.

6. Further Align Federal Health Care and Health IT Programs

The Department of Health and Human Services (HHS), working closely with states and the private sector, should align policies, programs and requirements associated with the use of IT for multiple federal health care programs, including those related to delivery system transformation, payment, public health, health care coverage and access, administrative improvements, and program integrity. HHS should continue to review health IT programs to assure they align with the needs of delivery system and payment reforms.

The federal government and private sector payers should coordinate and align performance measures. Specifications for such measures should be unambiguous, field-tested and align with data standards adopted by the HHS secretary.

Public and private sector leaders should collaborate on the development of a common set of principles, policies, and standards related to the use of electronic data for population health purposes, including those related to measurement and improvement of outcomes, medical product safety, public health, and research.

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Chapter 1: Introduction

Rising costs, inconsistent quality and eroding coverage are the primary challenges facing the U.S. health care system. These challenges have created an increased sense of urgency to meet the triple aim of improving health, improving the experience of care for patients and families, and reducing the cost of care. Both the public and private sectors have spearheaded major new initiatives designed to achieve the triple aim through new models of care delivery and payment reform.

Health IT plays a critical and foundational role in these new models of care. When well designed and effectively used, health IT saves lives, improves quality and reduces costs.

The Health Information Technology for Economic and Clinical Health (HITECH) Act was signed into law in February 2009, bringing with it an unprecedented investment of nearly $30 billion in health IT to improve the quality, safety and efficiency of health care. A majority of this investment is in the form of incentive payments from the Centers for Medicare and Medicaid Services (CMS) to clinicians and hospitals when they use electronic health records (EHRs) in specific meaningful ways to improve care.[1] Known informally as "Meaningful Use," this program has also directly and indirectly spurred significant private sector investment in bringing more use of IT to health care.

As we approach the three-year anniversary of HITECH, it is clear that the health care landscape is changing. Today, coordinated, accountable and patient-centered models of care delivery – previously implemented by only a handful of organizations – are poised for more widespread adoption to promote much-needed improvements in the cost and quality of health care. Initiatives launched by the federal government, numerous states, providers and private sector payers – operating both at the national and regional levels – have driven this shift in approach.

Key questions explored by the task force include the following: are the massive investments brought about by HITECH on the right trajectory to support new models of care and the triple aim? How do current health IT capabilities in the U.S. health care system compare with what is needed? What are the barriers to widespread adoption of these capabilities? What actions need to be taken to improve the cost and quality of health care through the use of health IT?

Chapter 2: High Performing Health Care Organizations and New Models of Care Demonstrate Common Attributes That Require Advanced Health IT

Our nation's highest performing health care organizations share many attributes common to widely accepted new models of care despite operating in a wide range of settings – large and small, rural and urban. These attributes enable these organizations to promote higher quality care, lower cost and greater access. Understanding these attributes and the critical role that health IT plays in enabling them (listed below), can help shape public policy decisions and private sector investments regarding the most effective allocation of resources on health IT.

Organization-Wide Focus on the Needs of the Patient

Patients are at the center of high-performing organizations and new models of care. Health IT supports patient engagement in all aspects of health and health care by offering individuals access to the information they need to manage their health and navigate care. Patients benefit from secure access to information contained in their EHRs, effective communication with their clinicians and care teams during and between visits, educational resources, and user-friendly self-monitoring and tracking aids. The specific health IT capabilities that support patients are integrated into each of the categories listed below.

Strong Organizational And Clinical Leadership

In a high-performing organization, focused, collaborative leaders set goals purposefully and implement plans to achieve them. These leaders support the pursuit of clear, shared aims derived from the organization's mission, vision and values. They also create and promote a top-to-bottom organizational culture that focuses on the needs of the patient, values trust and respect, encourages continuous learning and innovation, and demonstrates the ability to adapt to change. Physician leaders serve as role models, while playing a key role in the development of interventions that improve care delivery, including IT solutions.

Health IT enables health care organizations to optimize clinical, administrative and operational data, including patient and community information, in order to set goals, identify opportunities for improvement and monitor progress.

Health IT capabilities that support strong organizational and clinical leadership include:

1. Access to clinical, administrative, community and patient-generated data in electronic form, in order to set goals and track performance.
2. Normalization and analysis of data from a range of diverse settings and across time in order to assess performance on quality, cost and patient experiences, identify opportunities for improvement, and monitor progress.

Access to Information to Support Efficient, Coordinated Care

One reason that U.S. health care quality suffers and costs are high is that care is typically delivered in a fragmented, siloed delivery structure. In contrast, high-performing organizations work hard to coordinate care across providers, settings, conditions and time. Multi-disciplinary teams communicate effectively and deliver integrated, collaborative care.

Access to patient records from across a range of settings, along with clinical decision support tools, helps clinicians and care teams provide integrated, patient-centered and evidence-based care both at the point of care and between visits. Information to help patients manage their

own health and make decisions with their clinicians is also readily accessible. Information management tools help health care organizations manage the health of their population of patients.

Health IT and health information exchange enable all providers who care for the patient, as well as patients and family caregivers (or "care leaders"), to access the right information at the right time. The information is drawn from patient records in hospitals, physician practices, laboratories, pharmacies, and health plans, as well as from the patients themselves. Privacy and security are carefully managed.

The secure electronic exchange of patient data provides an essential platform for care coordination and helps clinicians, care teams, patients and caregivers track and manage the patient's journey through the health care system. Online access to patient data across settings and over time, as well as feedback on performance and "virtual consultations," enables effective coordination that increases quality, efficiency and access. Reminders and alerts for patients and health care professionals help eliminate both gaps and duplication in care.

Health IT at Work: Access to Information to Support Efficient, Coordinated Care

Group Health Cooperative, a non-profit, consumer-governed, integrated health insurance and care delivery system based in Seattle, WA is now widely deploying a patient-centered medical home based on the results of a prototype that includes, among other things:

- Linkage of patients with accountable primary care physicians working in multi-disciplinary teams;
- Use of electronic registries, health maintenance reminders and best practice alerts as collaborative care plans to guide patient and care-team activities;
- Significant visit preparation including contacting patients in advance to clarify concerns; reviewing record for follow-up tests, referral notes and outside records; and reviewing reports for unmet care needs;
- Conducting outreach and follow-up on all discharges or emergency/urgent care visits;
- Conducting outreach for medication monitoring and abnormal test results; and
- Use of secure messaging and patient access to a patient portal to support communication with patients.

Compared to other Group Health Cooperative clinics, patients in the prototype experienced 29 percent fewer emergency visits and six percent fewer hospitalizations. Total savings of $10.30 per patient per month were achieved.[2]

Health IT, along with other enablers, can support care coordination, strong communication and follow-up between visits which are needed for coordinated, accountable, patient-centered care.

Health IT capabilities that support access to information and efficient, coordinated care include:

1. Electronic access for all members of the care team to information about the patient, with safeguards that effectively manage privacy and security. Such information resides across several health settings including:
   - Hospitals and health systems
   - Primary care professional offices
   - Specialist offices
   - Clinics
   - Laboratories
   - Pharmacies
   - Health plans
   - Radiology centers
   - Long-term care facilities
   - Patients
2. Electronic access to the following types of information, which are critical to both care delivery and improvements in the health of patient populations:
   - Patient demographic information
   - Diagnoses and problems
   - Procedures and other services provided during visits and hospitalization
   - Discharge instructions and recommendations
   - Laboratory, imaging and other diagnostic test orders and results
   - Medication lists
   - Allergies
   - Prescriptions written and filled
   - Referrals and authorizations
   - Cost information
   - Patient preferences
   - Patient experiences
   - Patient functional status
3. Analysis of patient information to support identification of trends, gaps and duplications in care; summarized information that is easy to understand and useful for clinicians and other care team members.
4. Reminders and alerts to the care team and the patient (or his or her designated caregiver) about recommended interventions based on the analysis of patient information and evidence-based guidelines.
5. Electronic access for patients to information contained within the EHRs of all of their providers and other clinical and administrative applications in a format that is easy to understand, along with educational material to provide context; ability for patients to upload and/or download information so it can be shared with both caregivers and clinicians operating in other settings and interface with personal online and mobile applications.
6. Ability for patients to communicate their experiences, preferences, functional status, and other health-related and administrative information to their clinicians and care team, using electronic tools.

Timely Access to Care

High-performing health care organizations provide multiple avenues for patients to receive timely care and/or consultation in appropriate settings.

Online and electronic patient tools, including patient portals (applications that allow secure communication directly between health care organizations and patients),

mobile applications and secure messaging, facilitate timely communication among care teams and patients between visits. Online scheduling and reminders improve provider operations and help patients arrange access to care that suits their schedules and needs. "Virtual" consultations enable primary care physicians and their patients to get timely advice and guidance from specialists regardless of their physical location, giving patients everywhere access to the same quality of care. Convenient and cost-effective electronic visits are available when face-to-face visits are not required.

Health IT At Work: Timely Access to Care Through Secure Messaging

Kaiser Permanente, a not-for-profit integrated delivery system serving 8.6 million members in nine states, enables its patients to email their physicians using secure email messaging. A study conducted over a nearly three-year period revealed that use of secure patient-physician email was associated with significant improvements in glycemic (HbA1c) cholesterol levels and blood pressure screening and control.[3]

Through health IT, physicians in a diverse range of settings, large and small, can securely exchange email with their patients with positive results.

Health IT capabilities that support timely access to care include:

1. Online and electronic tools that support education, self-care, remote monitoring and communication;
2. Online scheduling and reminders for patients;
3. Secure messaging between providers and patients to help prepare for in-person visits while enabling communication between visits; and
4. Virtual consultations (e.g., through telemedicine including remote audio or video communications) to improve primary care physician access to specialists.

Emphasis on Prevention, Wellness and Healthy Behaviors

High-performing organizations help patients understand their health by offering educational resources that are targeted to their needs.

Through electronic educational resources, interactive tools, preventive care reminders and electronic communication with care teams, health IT can help patients more effectively understand and manage their health and wellness.

Health IT capabilities that support prevention, wellness and healthy behaviors include:

1. Online educational resources to support awareness of prevention and wellness strategies;
2. Tracking and self-monitoring tools offered online and through mobile "apps" to help patients adhere to various regimens;
3. Connections between self-monitoring tools and the EHR to improve communication between individuals and their care teams, and identify the need for interventions;
4. Reminders and alerts through email or text messages about preventive or follow-up actions that need to be taken, such as immunizations or screenings; and
5. Social media platforms for online dialogue and support among individuals with common conditions, needs or interests.

Accountability, Alignment of Incentives and Payment Reform

High-performing health care organizations continuously measure their performance against clinical and cost metrics. They take responsibility for populations of patients, across time and across settings, by accessing and analyzing clinical, claims and, in many cases, patient-generated data to identify gaps in care and opportunities for improvement. They use data to better match resources to patients' needs, creating incentives that promote better outcomes, not merely higher volume.

Health IT and health information exchange enable organizations to access and analyze clinical, administrative and patient-generated data to set goals, identify areas for improvement, assess effectiveness of interventions, and monitor performance related to cost, quality and patient experience – all of which support accountability, transparency and payment reforms.

Health IT capabilities that support accountability, alignment of incentives, and payment reform include:

1. Ability to access and analyze clinical and administrative data that reside within systems across multiple settings and time to set goals, identify opportunities and strategies for intervention, track progress, and monitor performance on cost, quality and patient experience and satisfaction; and
2. Rapid generation and dissemination of reports that summarize performance by provider, by patient, and across populations and subpopulations.

Health IT at Work: Accountability and Alignment of Incentives

Springfield, MA-based Accountable Care Associates, a spin-off of Hampden County Physician Associates that manages a network of about 700 care providers across three western Massachusetts counties, uses a web-based health IT infrastructure which supports care coordination and management; information sharing among primary care physicians, nurse case managers and hospitalists; patient reminders; and quality and cost measurement and improvement for payment programs.

Results include 20 percent savings on Medicare patients and increased satisfaction among patients, care providers, and office staff. Performance on every quality measure has improved.[4,5,6]

Assessing Provider Capacity to Organize Care Delivery to Achieve Performance and Accountability Goals

Research on 20 accountable care programs led by a mix of national and large regional health plans indicates that the private sector uses the following criteria to assess provider capacity and readiness for new care delivery and payment models:

- Clinical integration/network adequacy
- Leadership
- Long-term relationship
- Ability to initiate and implement change
- Health IT infrastructure
- Patient panel size
- Willingness to accept new payment arrangements[7]

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Chapter 3: Achieving the Health IT Capabilities Necessary to Improve Health and Health Care: Findings and Recommendations

The ideal health care system would possess all of the attributes and capabilities previously described. To realize this vision, we must first understand the gaps that currently exist and the barriers to closing those gaps. Only then can we develop and execute effective recommendations.

Alignment of Financial Incentives

New models of care, supported by the health IT capabilities required for their success, will not become the norm without changes in the way we pay for health care. Since payment currently is based primarily on volume rather than on quality outcomes and value, there are limited financial incentives to implement delivery system reforms and the health IT capabilities needed to support them.

Through the Center for Medicare and Medicaid Innovation (CMMI), the federal government is conducting a number of pilots and programs designed to test and evaluate new delivery system and payment reforms. Some state agencies are also implementing such programs, along with the private sector, through initiatives led by health plans, providers and community-based initiatives. A recent study identified 30 accountable care arrangements within 22 U.S. health plans, and this number is rapidly evolving as new arrangements are implemented.[8] Medicare and private sector health plans should continue to explore payment reforms such as shared savings models, bundled payments, global and partial capitation, value-based incentives applied to traditional fee-for-service payment models, and blended models.

Meaningful Use incentives and related health IT programs are a critical first step toward establishing the health IT capabilities needed for new models of care. Meaningful Use must increasingly support interoperability and health information exchange, patient access to information, and robust clinical decision support, all of which are required for coordinated, accountable, patient-centered models of care. However, creating, using and maintaining the "data-rich" environments necessary for delivery system reforms will require health IT, eHealth and analytical tools that appropriately fall beyond the current and anticipated requirements for Meaningful Use and related certification programs. Because creating these tools will demand flexibility and innovation, the requirements that emerge for these capabilities should focus on outcomes and not be overly prescriptive or necessarily linked to Meaningful Use and associated certification requirements.

Recommendations for Aligning Incentives

1. *Align Incentives with Cost and Quality Outcomes and the Health IT-Enabled Models of Care that Support Them.* Federal, state and private sector purchasers and health plans should align incentives and payment with higher quality, more cost-effective health care, along with the health IT-enabled coordinated, accountable, patient-centered models of care delivery that support such outcomes.
2. *Incorporate Attributes of New Models of Care in the Replacement of the SGR.* As Congress looks to develop a long-term "fix" to the sustainable growth rate (SGR) formula currently used to calculate fee-for-service payment rates for physicians and other professionals who treat Medicare patients, it should use this opportunity to accelerate shifts from the current model of payment to models that reward coordinated, accountable, patient-centered care and improvements in cost and quality outcomes.
3. *Continue and Expand Pilots and Programs for New Models of Care.* Federal, state and private sector entities should accelerate the pace of piloting, evaluating and implementing new coordinated, accountable, patient-centered models of care and payment reforms that promote the triple aim. The government should move

more aggressively to implement fundamental payment reforms to shape a higher quality health care system. Examples include accelerating the use of bundled payments by moving beyond the pilot stage and using this payment model to cover all Medicare inpatient discharges; accelerating the implementation of the current Section 3001 plan to establish a hospital value-based purchasing program; and expanding the Hospital Quality Incentive Demonstration project nationally.

Congress should assure adequate and sustained funding for CMMI, which is testing and evaluating new delivery and payment models, including those that involve advance payment, bundled payments, care management fees, shared savings, and blended models. Recognizing the critically important role that high-performing organizations play in moving the entire health care system forward, the public and private sectors should continue to create incentives that support and encourage continuous innovation in these organizations.

4. *Share Lessons Learned from Public and Private Sector Pilots.* Lessons learned from federally funded and private sector-sponsored programs designed to test and evaluate new models of care should be shared broadly on a timely basis to advance progress across the health care system. CMMI as well as health plans, integrated delivery systems, and community-based initiatives should share the near- and intermediate-term results of programs they have conducted or sponsored. CMMI should also integrate lessons learned from the private sector in the development and execution of its programs related to delivery system and payment reforms.

Privacy and Security

How will sensitive health data be kept confidential and secure in digital data sharing environments? Many consumers, patients and industry stakeholders are waiting for a reassuring answer to this question. Consumers should and do expect that their health information will be kept private and secure. Solidifying public trust in and support for health IT and electronic health information exchange initiatives will require assurance about the processes used to protect the privacy and security of health information.

Existing privacy and security laws largely cover electronic personal health data, but there are gaps that must be addressed. Chiefly, protections for health data enacted under HIPAA apply only to certain entities in the health care system (such as most health care providers, health insurers and entities that provide clearinghouse functions with health data). Commercial entities that market health tools directly to the public (such as platforms for personal health records and health-related applications for the Internet and smart phones) are not covered by HIPAA with respect to such tools.

This uneven coverage of federal health privacy law can be confusing for consumers and contributes to reluctance on the part of health care entities and consumers to share data beyond the limited, HIPAA-covered environment. This also creates an uneven playing field, where some entities handling health information are subject to comprehensive regulation (with the potential for substantial penalties for noncompliance) and others are regulated minimally, and largely bound only to any voluntary commitments made in a privacy policy or user agreement.

Since most applicable federal and state privacy laws cover identifiable health information when it is stored, used or shared in any form (paper or electronic), most health care providers already have sufficient legal authority to electronically store, use and share health information for treatment, payment and routine administrative tasks ("health care operations"). Some more sensitive health data (such as mental health records, or HIV or genetic test results) may be subject to heightened privacy requirements under federal or state law.

However, uncertainty about how to comply with existing and new health data privacy and security laws and regulations, coupled with concerns about liability, may make entities reluctant to adopt health IT and broadly share electronic data. Entities that typically seek to minimize uncertain legal risk may be uncomfortable sharing data in uncharted areas.

Accurately matching patients with their health information is another concern. As the nation moves more aggressively toward sharing identifiable health information across disparate settings, concerns about historically suboptimal levels of accuracy in matching patients to their health information are exacerbated by poor data quality and incomplete data collection. Inaccurate matching can result in missing or incorrect information in a patient's record, threatening both the quality and the safety of care, and leading to possible breaches of confidentiality.

Many have posited that a unique patient identifier is needed to solve this problem, but there is not widespread agreement on the efficacy or political feasibility of such a solution. A collaborative effort is needed to assess needs and alternatives, and to develop common solutions designed to improve accuracy and reduce risk, complexity and cost associated with accurately matching patient data across organizations.

Recommendations to Address Concerns About Privacy and Security

1. *Require Consistent Protections for Personal Health Information.* All entities that access, use and disclose consumers' personal health information should be required to comply with privacy and security requirements that are at least as comprehensive as those applicable to entities covered by HIPAA.
2. *Issue Comprehensive and Clear Guidance.* The administration should consistently issue comprehensive and clear guidance on compliance with federal privacy and security laws covering personal health information, with reasonable and achievable implementation timelines. Such guidance should address access, use and disclosure of health information for treatment and public and population health purposes, and be consistent in approach across multiple agencies. State governments should also provide such guidance with respect to state health privacy laws.
3. *Develop and Implement National Strategy for Accurate Patient Matching.* Federal policymakers, working with industry and consumer stakeholders, should ensure the prompt development and implementation of a national strategy for improving rates of accuracy in matching patients to their health information.
4. *Disseminate Common Sense Security Practices.* HHS should encourage and support the development and widespread dissemination of basic, "common-sense" security practices to health care providers, health care professionals and individuals and organizations working within the health care industry. Such guidance should include procedures that help providers comply with the HIPAA Privacy and Security Rules.

Adoption of Electronic Health Records

EHRs are a foundational component of the health IT capabilities needed for new models of care. EHRs bring to the point of care important information about the patient from across the multiple settings where care is delivered and tests are performed. They also incorporate evidence-based clinical guidelines to support good decision-making.

The Future of Health IT: Caring for an Elderly Parent from Afar

An office manager in a busy architectural firm, Mary is at work when her mother calls. "I don't feel right," she says. Irene, Mary's aging mother, lives alone more than 300 miles away, still in her own home. She has cardiovascular disease and congestive heart failure, among other problems, and three weeks ago she was hospitalized because of worsening symptoms. After doctors placed stents in two of Irene's coronary arteries, her condition improved. She was discharged home last week.

Cradling the phone on her shoulder, Mary turns to her computer. She quickly accesses a secure health status dashboard available through a patient portal provided by her mother's patient-centered medical home. It provides a real-time snapshot of her mother's current wellbeing and medical condition.

Even from afar, health information technology helps Mary keep in close touch with her mother's day-to-day health and with her mother's care team. The primary care practice where Irene gets her care uses consumer-friendly computer tools that enable Mary, with her mother's consent, as well as Irene's care team to monitor Irene's health and the conditions she lives with, including heart disease, hypertension, obesity and depression.

A specially trained care coordinator who is part of the care team led by Irene's primary care physician works proactively with her to manage her health. Using the practice's patient portal, which links with Irene's electronic health record (EHR), the care coordinator reviews automatic updates on Irene's progress against the care plan that Irene and her primary care doctor created. That care plan also reflects ongoing input and feedback from Irene's specialists, her daughter Mary and Irene herself, while integrating the discharge instructions from her recent hospitalization. The system aggregates daily metrics such as blood pressure and weight – automatically uploaded from technology placed in Irene's home – with information supplied by Irene such as her food diary, activity level and moods.

Automatic alerts let the care coordinator know when some aspect of Irene's health requires attention. Today the care coordinator notes that Irene's blood pressure and weight are both trending up. If these trends continue, Irene could wind up being readmitted to the hospital, a fate that, within 30 days of discharge, befalls about a third of heart failure patients in the U.S. The scale of this pattern is significant: heart failure is the most common reason for hospitalization among older patients, costing nearly $30 billion annually.[90]

While Mary listens to her mother describe her symptoms on the phone, she also dashes off a message to Irene's care coordinator using the secure patient portal she has access to, again with Irene's consent. She asks the coordinator to check in with her mother by phone to discuss her current symptoms.

The coordinator acknowledges the secure email message, and assures Mary that she was already planning to contact Irene based on the data she had reviewed. Mary reassures her mother that her care team is paying attention, and suggests that they hang up so that the coordinator can reach her and address her concerns.

Mary knows that her mother is in good hands, and feels grateful to be as informed and involved as possible, despite the distance between them. Both Mary and her mother rest easier at night as a result.

Physicians and hospitals commonly cite the following barriers to adoption of EHRs: the upfront costs associated with purchasing a system; the significant time and financial commitment required to make the necessary organizational and work flow changes; concerns that the system will become obsolete or not achieve requirements associated with incentive programs; lack of an adequately trained health IT workforce; and concerns about not having the capacity to select, contract for, install and implement a system.[9,10,11,12]

These barriers are more pronounced in small physician practices, community hospitals and clinics in both rural and underserved communities. Barriers such as capital costs and the lack of trained health IT staff are particularly challenging.[13,14,15,16] Rural providers also face challenges associated with limited broadband access.[17]

Despite these barriers, adoption of EHRs is growing. In 2011, nearly 34 percent of office-based physicians had adopted a "basic"[18] EHR, representing significant growth from about 25 percent in 2010.[19] According to a survey conducted by the American Hospital Association (AHA), 15 percent of non-federal hospitals had adopted a basic EHR in 2010, a 29 percent increase over 2009 rates.[20] The level of EHR adoption among hospitals has rapidly grown over the last year, as evidenced by the level of hospital participation in the Meaningful Use Program.

In 2011, CMS and numerous state Medicaid programs began making payments through the Meaningful Use EHR Incentive Program. As of December 31, 2011, 26,525 or five percent of the 521,600 eligible professionals in the U.S. had received incentive payments under Medicare and Medicaid, while 172,974 had registered their intent to qualify for such payments. For the same period, 1,620 or 32 percent of the 5,011 hospitals had received incentive payments under Medicare and Medicaid, while 3,077 had registered for the Incentive Program.[21]

Although current Meaningful Use levels are less than originally projected when HITECH was enacted, registration for and payment of incentives associated with the Meaningful Use Program have been growing rapidly. In 2011, 52 percent of physicians reported that they intend to apply for Medicare or Medicaid EHR incentive payments, a 26 percent increase from 2010 levels.[22] Ninety-five percent of hospitals participating in a January 2011 AHA survey reported that they plan to pursue the Meaningful Use requirements.[23]

Providers cite the complexity of the requirements and specifications as a barrier to achieving Meaningful Use and certified EHR technology, a concern heightened by fears of compliance audits and related penalties. In a recent survey, 53 percent of hospitals cited "lack of clarity in regulatory requirements" as a barrier to achieving Meaningful Use in a timely manner.[24] Some of the specific requirements of Meaningful Use also present challenges. Hospitals cite the difficulty of capturing and calculating quality measures within a certified EHR as a major barrier.[25,26] Hospitals also list implementation of computerized physician order entry and submission of electronic public health surveillance data as challenges.[27]

Finally, hospitals and physicians report that it is difficult to make EHR adoption a priority among several competing initiatives from multiple federal and state programs emerging from both HITECH and the Patient Protection and Affordable Care Act (ACA) of 2010.

HITECH created several programs to address the barriers described above. As was the intention, the Meaningful Use incentives themselves are helping to defray some of the costs associated with EHR adoption.

To help with implementation, HITECH provided more than $700 million in funding to support the creation of 62 "regional extension centers" (RECs). These entities are

designed to help "priority providers" implement EHRs; priority providers include individual and small group practices of 10 or fewer professionals, public and critical access hospitals, community health centers, and rural health clinics.[28] As of November 16, 2011, more than 100,000 providers had signed up for technical assistance from RECs.[29]

Although such programs have helped to jump-start implementation assistance and raise awareness of the Meaningful Use incentive program, they will likely not be sufficient to help the more than 660,000[30] physicians in the U.S. who will need help making the transition to EHRs – including the 521,600[31] who are eligible for Meaningful Use funds. More assistance and innovation is needed, particularly for group practices with five or fewer professionals where 74 percent of the total physician visits in the U.S. take place.[32]

Federal investment in health IT workforce development programs conducted by nine universities and 82 community colleges across the U.S. has increased the size of the trained labor pool. As of October 2011, 5,717 professionals successfully completed their training in health IT through community colleges, and as of November 2011, universities have graduated more than 500 post-graduate and masters-level health IT professionals.[33] Despite such progress, the need for additional qualified staff far outpaces the supply. More innovative training and education programs will be needed to support not only continued upgrades and implementations of new systems, but also the health care workforce of the future, who will need to be adept at providing and managing care enabled by health IT.

Both CMS and the Office of the National Coordinator for Health Information Technology (ONC) have taken several positive steps to improve the clarity of the Medicare and Medicaid EHR Incentive Program and the related ONC Certification Program. For instance, they have created a searchable guide for frequently asked questions, conducted numerous educational calls, and published a new guide on the Medicare EHR Incentive Program for Eligible Professionals, which was released in November 2011. They have also begun to implement a series of recommendations identified by health care stakeholders. Nevertheless, more work is needed to provide clarity and guidance on interpreting these complex requirements.

Recommendations to Address Limited EHR Adoption

1. *Build Awareness and Expand Implementation Assistance for EHR Adoption and Meaningful Use.* Beginning in 2012, the federal government through HHS, the states and the private sector – including providers, payers, vendors and consumer groups – should develop and execute collaborative strategies to raise awareness of the Medicare and Medicaid EHR Incentive Programs. More importantly, both the public and private sectors should develop and implement EHR- and Meaningful Use-related training for providers, with a particular focus on small physician practices and community hospitals and clinics that deliver care to rural and underserved communities. Private sector efforts – such as those sponsored by advanced-stage health systems, health plans, medical societies and other clinician-led organizations, regional extension centers, vendors, consulting organizations, and non-profit organizations – should continue and rapidly expand.
2. *Improve Clarity of Meaningful Use Requirements.* ONC should expand efforts to further clarify Meaningful Use rules, regulations and requirements, as well as related standards and certification programs, so that private sector users can more easily understand them and move more rapidly toward implementation.

3. *Leverage Lessons from Federally-Funded Programs to Advance Progress.* Beginning in 2012, HHS should make available to the public best practices, tools and lessons that are emerging from federally-funded programs, including the Beacon Community Program, Regional Extension Center Program, State Health Information Exchange Cooperative Agreement Program, Strategic Health IT Advanced Research Project (SHARP), and Workforce Development Programs. For the most part, such information is currently only available to federal grantees and contractors.
4. *Accelerate Sharing of Strategies and Best Practices for More Challenging Components of Meaningful Use.* The private sector, in collaboration with ONC and CMS, should rapidly develop and execute effective methods for sharing best practices and practical strategies for addressing particularly challenging areas associated with Meaningful Use, including those related to clinical quality measurement, computerized provider order entry, clinical decision support and public health surveillance reporting.
5. *Improve Usability of EHRs.* To improve the usability and safety of EHRs and accelerate the maturation of the EHR market, vendors, clinicians, hospitals and other providers should collaborate to identify common challenges and issues related to usability, including those with implications for patient safety, and develop and execute strategies to overcome them.

Engaging Consumers with Electronic and Online Tools

Patients are at the center of new models of care, and health IT plays a critical role in supporting patient-centered care. Common attributes of patient-centered care include "whole person" care, strong coordination and communication, patient support and empowerment, and ready access.[34]

High-performing organizations are increasingly implementing patient portals, personal health records (PHRs, online health records maintained by patients), health information exchange, and other modes of communication – such as mobile technologies – to improve communication, coordinate care and facilitate shared decision-making with patients. They also offer online, interactive tools that empower patients through education and self-care. Secure methods of electronic communication and e-visits, coupled with online scheduling and reminders, make care more accessible and convenient.

Research shows that many of these functions improve quality, reduce costs or improve patient satisfaction. For example, evidence shows that secure messaging between patients and their providers enhances quality of care and outcomes.[35,36] Other studies indicate high levels of patient satisfaction with online consumer tools. Patient enrollees in Group Health Cooperative's MyGroupHealth (a patient portal) report high levels of satisfaction with secure messaging, refilling medications and viewing test results.[37]

Consumers perceive value in conducting several health care-related functions online, including renewing their prescriptions, reviewing lab test results and scheduling visits to their doctor(s).[38] Consumers are also interested in using remote monitoring devices to track their health and communicate with their providers. For example, 61 percent of consumers surveyed indicated interest in using a medical device that would enable them to check their conditions and send that information to their doctors electronically.[39]

Although 80 percent of Internet users have looked online for information about health topics,[41] the availability and use of online and electronic tools to support specific functions related to health and health care is still not widespread. For example, only 15 percent of consumers have renewed their prescriptions online and only six percent of consumers

have looked at their test results online. Eight percent of consumers have emailed their providers.[42] This is largely due to current low levels of adoption of these services within provider organizations.

Various surveys indicate that anywhere from seven to 11 percent of Americans currently maintain an electronic PHR.[43,44,45] Fifty-one percent of current PHR users have a PHR that is sponsored by their health plan, while 26 percent use a PHR that is sponsored by their doctor or health care provider.[46] Six percent use a PHR that is sponsored by "others," which includes online sources such as WebMD, ihealthrecord.org and Microsoft HealthVault.[47]

Health plans have led the way in offering online tools to help individuals manage their health and a majority of health plans currently offer online tools to their members.[48] Providers, however, have been slower to adopt. A January 2011 industry report found that only 25 percent of physician practices with an EHR offer patient portals to their patients and only 21 percent of hospitals that have an EHR do the same.[49] In a national survey of physicians, researchers found that 64 percent of physicians have never used a patient's PHR, however 42 percent were willing to try.[50] For the most part, large integrated delivery systems with high levels of EHR adoption have experienced the most success with online tools provided to patients.[51] Well-known examples include Kaiser Permanente's My Health Manager, Group Health Cooperative's My Group Health, and the Veterans' Administration MyHealthyVet offering.[52,53,54] With the support of Meaningful Use incentives, smaller, less integrated organizations will be able to offer similar tools to their patients.

Several barriers stand in the way of increasing the availability and adoption of patient-friendly electronic and online tools. Implementing online and electronic tools that offer information and services of value to the patient without having adopted an EHR is difficult. Even some who have adopted EHRs find that integrating the functionalities that make provider-sponsored tools useful – such as enabling access to laboratory test results, renewing prescriptions online or scheduling appointments – is difficult given the changes in work flow that are required.

To date, given the lack of health information exchange across organizational entities in health care, PHRs either require an individual to manually populate the record, or are populated only with information from the sponsoring organization. For example, health plans might provide claims information, which includes not only coverage and

	% PHR users that believe that online function is somewhat or very useful[40]
Looking at test results	57%
Renewing prescriptions online	52%
Emailing providers	50%
Scheduling doctors' visit	48%
Getting reminders for tests	44%
Keeping track of child's records – among parents	43%

The Future of Health IT: The Ongoing Need for Attention and Guidance

Like many of her friends of the same age, Maria, 53, pays close attention to the health of her children and her aging parents, but puts her own health and other needs on the back burner. However, when she was recently diagnosed with diabetes, she realized all this would need to change.

Maria has battled her weight for years, but now she is newly motivated to lose weight and get healthier. She and her primary care physician (PCP) agree to create a wellbeing portion of her overall care plan that includes exercise and nutrition components to support weight loss and other health improvement target goals.

Every Sunday, Maria assesses her progress against her wellbeing plan. She uses a tracker and assessment application on her personal health management system that compares her weekly efforts and activities to her plan. The analysis includes quantifiable data that is automatically fed into the application, including her biometrics – glucose (HbA1c) levels, weight, blood pressure – exercise and other activities tracked by her digitally connected glucose meter, accelerometer, weight scale, blood pressure cuff and smart phone-based food and yoga journal.

Maria knows that the first week of each month is the time that her PCP's medical home care coordinator checks to see how she is doing on her wellbeing plan. This helps keep Maria engaged, responsible and on track in meeting her short- and long-term personal health goals.

Now, Maria feels a good sense of security and comfort knowing that her PCP, care coordinator and broader care team are watching over her, a bit like she does for her own family as their "health leader."

billing information, but also procedures, diagnoses, drugs utilized and often even laboratory test results. Physician practices, hospitals or health systems might provide information from a patient's EHR. For a PHR to have considerable value to individuals, it needs to integrate clinical information from their multiple providers (many of whom have not yet adopted EHRs) with the clinically-relevant coverage information and billing information from their health plan, and must do so on a timely basis.

Physicians continue to have concerns about privacy when it comes to using electronic tools to communicate with patients.[55] They also remain concerned that secure messaging will invite an unmanageable number of messages from patients—a concern that many high-performing organizations say from experience is unfounded.

Many consumers also have concerns about privacy and security.[56,57] Other barriers among consumers include lack of health IT awareness, reduced computer skills, limited health literacy, or unmet technical or information support needs.[58,59] Special care must also be taken to assure that the "digital divide," or the population-level gap in Internet and computer access, does not prevent certain groups from taking advantage of online and electronic tools. A recent study indicates that despite increasing

Internet availability, minority patients adopted a PHR less frequently than non-minority patients, and patients with the lowest annual income adopted a PHR less often than those with higher incomes.[60]

Recommendations to Increase Engagement of Consumers Using Electronic Tools

1. *Build Awareness of Benefits Among Consumers.* Building on the consumer awareness campaign initiated by ONC in September 2011, both the public and private sectors should take additional steps to demonstrate how electronic tools can help consumers manage their health and engage further with their providers. This campaign, which should leverage both electronic as well as traditional, non-electronic forms of outreach, should promote the benefits of electronic tools and information about how patients' privacy is protected, along with steps consumers can take to protect their own privacy in online health communication, to help foster the trust necessary for widespread adoption. Clinicians and hospitals can promote the benefits of electronic tools on websites, in brochures in the waiting room, and through seminars that explain how the tools work.
2. *Educate Providers on the Benefits and Support Them in Making the Transition.* To support the transition to a more patient-centered health care system enabled by health IT, public and private sector organizations, including federal and state government agencies, consumer and patient advocacy groups, employers, health plans, hospitals and clinicians, should collaborate on the following key actions beginning in 2012:
   a. Take steps to build awareness among providers (clinicians, clinics, hospitals and health systems) about the benefits of engaging further with their patients using health IT and e-health tools.
   b. Develop and widely disseminate education and training materials designed to help health care providers effectively develop, implement and use online and electronic tools to provide access to their health information, improve communication and coordination with their care teams and support self-care.
3. *Continue to Improve Usefulness and Usability of Consumer eHealth Tools.* Both the federal government and the private sector should take steps to enhance the usefulness and usability of consumer-facing health IT, such as:
   a. Develop and implement widely available common interfaces to support the easy import and export of health information – including information residing in both provider and health plan systems – into and from consumer-facing applications such as PHRs or mobile applications.
   b. Conduct additional research on consumer perspectives related to both the usefulness and usability of consumer-facing online and electronic tools.
   c. Launch an awards program highlighting health care leaders that have demonstrated positive outcomes in quality, safety, cost-effectiveness and patient satisfaction through engagement of consumers using online and electronic tools.
   d. Develop and implement mechanisms to enable the sharing of early experiences, lessons learned and best practices among early implementers to address concerns and support more successful implementations in the field.
   e. Develop and implement strategies to reach and engage minority and lower income populations in the use of online and electronic tools to support health and health care. These strategies should take into account limitations in Internet access or computer literacy,

and could include use of mobile and smart phones to support text message reminders and educational information. Subsidization of such technologies to support widespread adoption should be explored.

4. *Align Incentives with Health IT-Enabled, Patient-Centered Care.* Public and private sector purchasers and payers should align incentives with patient-centered care and the health IT tools that support patient engagement, including:

   a. Meaningful Use and related certification programs should enable patients to electronically access their health information from the EHR, receive reminders for preventive and follow-up care, and have access to educational resources specific to the patient's needs. In addition, future stages of Meaningful Use should enable patients to download their health information in both human-readable and structured formats, using widely available interfaces and/or data formats so that such information can be uploaded into applications preferred by the patient.

   b. Federally funded and private sector-sponsored payment and incentive programs should support the use of electronic tools for patient engagement. As applicable and appropriate, requirements should align with Meaningful Use.

   c. Public and private sector purchasers and health plans should communicate to their members which providers in their networks offer online and electronic tools to support their patients.

   d. Public and private sector purchasers and health plans should provide incentives to enrollees to use online and electronic tools to manage their health and health care. Examples include remote monitoring for those with chronic conditions and reminders to help patients comply with their care plans.

Interoperability and Health Information Exchange

The exchange of information across the multiple entities that deliver care and provide services to patients is a central and necessary component of coordinated, accountable, patient-centered models of care delivery and achievement of the triple aim.

Information associated with a patient's health and health care resides in many settings, including the offices of primary care physicians and specialists, hospitals, and clinics where care is delivered; laboratories and radiology centers where tests are performed; health plans where patients are enrolled; pharmacies and pharmacy benefit managers (PBMs); nursing homes and home health facilities; and even with the patient.

Without robust health information exchange, it will be difficult, if not impossible, to develop and spread several common attributes of high performance, including those related to care coordination, clinical decision support, shared decision-making among the patient and the care team, and measurement of outcomes to support accountability and improvement.

Research shows that health information exchange has a positive impact on both the cost and quality of care.[61,62] In a recent statewide survey, more than 70 percent of physicians indicated that they believe that health information exchange has a positive impact on reducing health care costs, increasing the amount of time saved, and improving the quality of patient care.[63] Patients also see value in health information exchange among their providers.[64]

Information mobility and the need for standards to facilitate the interoperability and exchange of information have always had strong bipartisan support. On August 22, 2006, President George W. Bush issued an executive

order requiring all federal agencies to utilize, where available, health IT systems and products that meet recognized interoperability standards. The order also requires the same for health care providers, health plans and health insurance issuers with which federal agencies contract.[65] In response, the HHS Secretary accepted and recognized more than 100 standards and implementation specifications.[66,67,68] Detailed language regarding structure, process and mechanisms associated with promoting health information exchange and standards for interoperability were included in numerous pieces of legislation sponsored by Democrats and Republicans, leading up to and including HITECH, which was integrated into the American Recovery and Reinvestment Act, signed into law by President Barack Obama in February 2009.[69] The President's Council of Advisors on Science and Technology (PCAST) also highlighted the need to significantly accelerate progress on robust health information exchange in its December 2010 report.[70]

Despite the widespread support and need for interoperable systems and health information exchange as a foundation for delivery system and payment reforms, the level of electronic health information exchange is very low in the U.S. health care system today.

Barriers to interoperability and health information exchange include:

- *Lack of a business case for health information exchange.* The most frequently cited barrier to health information exchange is the lack of a business model to support its adoption.[71] Because payment is currently based primarily on volume rather than on outcomes or value, there are limited financial incentives to use health information from across care settings to reduce duplicative tests or procedures or otherwise improve the quality or cost of care. Health information exchange will not occur at optimal levels or at scale without a viable, sustainable business model that includes, among other things, payment reforms that reward improvements in quality and costs of care; delivery system reforms that demand an information-rich environment to drive care coordination; and an array of value-added services that improve clinical quality and business efficiency.

  Stage 1 Meaningful Use requirements for health information exchange are limited. Although the "capability to exchange key clinical information" is a "core" (i.e., required) measure for eligible professionals and hospitals under Stage 1, only one "test" of a certified EHR technology's capacity to electronically transmit information is required and can be done using information for a fictional patient.[72,73] A related measure for both eligible professionals and hospitals requires them to provide a summary care record for more than 50 percent of care transitions and referrals, but this is a "menu" option (i.e., optional) in Stage 1 and need not be done electronically.[74,75]

- *Lack of an infrastructure to support health information exchange.* Reliable, sustainable and effective infrastructure for health information exchange is not widely deployed. A 2009 survey identified 75 operational (and largely publicly funded) regional health information organizations (HIOs) that cover approximately 14 percent of U.S. hospitals and three percent of ambulatory practices.[76] Only 13 of those HIOs facilitated the types of data exchange required to meet Meaningful Use criteria, and most surveyed were not financially viable.[77] While the number of "private" health information exchange organizations is growing rapidly – increasing from 52 in 2010 to 161 in 2011[78] – such organizations are typically based around one or two integrated delivery systems or hospitals.

  The federal government has launched several efforts under HITECH to support health information exchange, including the State Health Information Exchange

Cooperative Agreement Program which provides $548 million to 56 states and territories to expand their health information exchange capabilities;[79] the Direct Project and the Nationwide Health Information Network (Nw-HIN) Exchange initiative, each of which contributes standards and protocols for exchange but using different methods; and activities conducted under the Standards and Interoperability Framework, the goal of which is to bring together existing standards and improve the sharing of standards across different organizations and federal agencies.[80]

Providers, payers, states and vendors need a stronger understanding of the federal policy direction and strategy for health information exchange, including how the key federal programs work together to support the strategy.

ONC launched the Direct Project in 2010 to help providers begin to electronically transmit information to meet the limited health information exchange requirements of Stage 1 Meaningful Use. Informally known as "Direct," it is often described as a "push" model – somewhat like secure email – in which a message can be sent as long as the receiving person's email address is known. Direct, which can be used to send standards-based content, relies on existing privacy frameworks for data transmission, and avoids the complexities associated with linking a patient's data across systems before data can be transferred. While Direct is perceived by many to be easier to implement, and has been described by ONC as a useful "on ramp" to more robust two-way data exchange, health information exchange capabilities extending beyond Direct will be required for new models of care. These include access to, as well as query and retrieval of, data from across settings and time to provide both the care team and the patient with a longitudinal view of patient information and use of such data to support measurement and improvement of outcomes. Specifications associated with the Nw-HIN Exchange initiative and related families of standards do support these capabilities and are in active production, but can be more complex to implement for smaller providers. They also require more detailed privacy and security policies.

PCAST called for a range of recommendations designed to accelerate the transformation of health care through more robust exchange of health information. These recommendations include the establishment of a "universal exchange language" that enables health IT data to be shared across institutions and inclusion of more comprehensive health information exchange requirements in Stage 2 and 3 of Meaningful Use.[81]

- *Lack of agreement on and adoption of many of the standards required for interoperability and exchange.* HITECH established a structure and clear set of processes for the federal government's adoption of health IT standards for interoperability. The Health IT Policy Committee, operating under the rules of the Federal Advisory Committee Act (FACA), is required to recommend and prioritize the areas in which standards, implementation specifications and certification criteria are needed for the electronic exchange and use of health information, in alignment with a strategic plan developed by the National Coordinator of Health Information Technology. The Health IT Standards Committee is required to recommend to the National Coordinator a set of standards, implementation specifications and certification criteria that align with the priorities set by the Health IT Policy Committee as well as the strategic plan. Such recommendations are presented to the HHS Secretary for adoption, which is carried out through rule making.[82] In addition, under the National Technology Transfer and Advancement Act of 1995 and OMB Circular A-119, the federal government is required to use standards developed by voluntary consensus standards bodies in its regulatory and procurement activities

unless use of such standards would be inconsistent with applicable law or otherwise impractical.[83,84]

The initial set of standards, implementation specifications and certification criteria under HITECH were published on the Internet through an interim final rule on December 30, 2009 and published in the Federal Register on January 13, 2010.[85] Given the aggressive timeline associated with HITECH implementation, the initial set necessarily focused only on those standards needed for use in certified EHR technology to support Stage 1 Meaningful Use, including data content standards associated with laboratory results, medications, problems and procedures. Data transport standards – critical to the success of health information exchange – were not included in the initial set.

Achieving the triple aim and meeting the needs of new models of care require widespread agreement on and adoption of content standards for additional data types, such as imaging and radiology results, as well as more robust implementation guides for standards that have already been adopted. To accelerate semantic interoperability, easily downloadable and web-accessible tools that provide value sets and mapping in support of vocabulary standards for Meaningful Use are needed. The National Library of Medicine is working on such tools for LOINC, SNOMED-CT, ICD-9/ICD-10, and RxNorm.

Health IT and related data requirements necessary for population health improvements exceed, in some cases, those specified in current requirements for Meaningful Use and are also critical to addressing the quality, cost and access challenges of the U.S. health care system. These include those related to quality measurement and improvement, identification of and response to public health threats, research to assess the effectiveness of existing treatments and identify new ones, and medical product safety monitoring.

- *Concerns about privacy and security.* Provider and patient concerns about privacy and security as well as associated complexities in developing necessary exchange-level policies continue to hinder progress on health information exchange. Sixteen percent of physicians surveyed are very concerned about the effect of health information exchange on privacy, while 55 percent are somewhat concerned.[86] A majority of adults express discomfort (42 percent) or uncertainty (25 percent) with their health information being shared with other organizations even if identifying information such as name, address and other personal information are not included.[87]
- *Lack of Agreement on a Path Forward.* Health information exchange has been described as "a team sport." To provide value to those organizations needing access to data – and to ensure their willingness to pay for it – it is necessary to build a critical mass of health care organizations that also agree to transmit data using a common set of principles, policies, standards and methods. In addition to data content and transport standards, a common policy framework is needed to build and maintain trust among the organizations exchanging information, including patients.

As noted previously, the analysis of data that resides across multiple settings requires accurate methods for matching data associated with an individual patient. Currently for the most part, each organization engaged in interoperability and health information exchange either within or across settings, is developing and implementing its own solution to patient-matching, often using different policies and a range of algorithms offered by various commercial entities. The matching process is challenging, expensive and time-consuming; several health care organizations report that it requires considerable manual work. Agreement among multiple organizations on a trusted and reliable process can be difficult to achieve.

Several approaches have emerged to address the increasing and anticipated need for health information exchange, including health care organization and

community-based health information exchange initiatives, state-sponsored approaches, and point-to-point data sharing through mechanisms such as Direct. To date there has not been widespread consensus and commitment from federal and state governments and among vendors, providers and health plans on a common path forward, either at the national or local level. Although a "one-size-fits-all" approach appears unlikely due to regional market differences, health care leaders are increasingly looking for common approaches to accelerate efficient, cost-effective, trustworthy health information exchange.

Policy guides, standards, specifications and protocols developed by private sector collaborative efforts such as the Care Connectivity Consortium, Connecting for Health, the EHR-HIE Interoperability Work Group, the Health IT Standards and Interoperability Coalition, Integrating the Healthcare Enterprise (IHE), and the federally funded Beacon Communities Program can all be leveraged to accelerate more robust health information exchange. They can also be used to provide input to the Health IT Policy Committee and Health IT Standards Committee as they evaluate and recommend both policy and standards for federal adoption.

In addition, "testing tools" employed by both standards organizations and the federal government can accelerate widespread adoption of voluntary standards created by the private sector to meet the needs of coordinated, accountable care.

Recommendations to Accelerate Health Information Exchange

1. *Build a Business Case for Health Information Exchange.* Public and private sector purchasers and health plans should take several steps to increase incentives and build the value proposition for the health information exchange needed to achieve the triple aim and support new models of care, including:

   a. Stage 2 of Meaningful Use should expand the requirements associated with health information exchange for both eligible professionals and hospitals. The current "menu" objective for the provision of a summary care record associated with transitions of care should be required as a "core" objective. The requirements associated with the current core objective related to the exchange of key clinical information (e.g., problem list, medication list, medication allergies, diagnostic test results) among providers of care and patient-authorized entities should expand, requiring operational standards-based exchange of real patient information for a meaningful, but achievable, number of patients.

   b. EHR certification requirements associated with Stage 2 and 3 of Meaningful Use should include the ability to electronically receive, display and transmit a growing set of data types needed for new models of care.

   c. Standards associated with Stage 2 of Meaningful Use should include a focused set of data transport standards, including Direct as well as those that support both the transmission of and access to data from across multiple settings, with a mix of required and optional standards based on technical feasibility assessments.

   d. Federal, state and private sector purchasers and payers should require that data standards adopted by the secretary be reflected in the specifications associated with clinical quality measures required by their payment or incentive programs.

   e. ONC should enable further flexibility in and encourage bi-directional exchange approaches, along with Direct, in its administration of HITECH programs, including the State Health Information Exchange Cooperative Agreement Program.

2. *Develop a Long-Term Data Strategy for Interoperability and Standards that Aligns with Health and Health Care Priorities.* Information within the largely paper-based

health care system today is used not only for the delivery of care and support of patients' individual health needs, but also for improvements in population health.

Building on the initial set of standards and specifications developed for Stage 1 of Meaningful Use, the Health IT Policy and Health Standards Committees, by December 31, 2012, should assure the development of a long-term strategy and work plan to support the data needs associated with improving health and health care while reducing costs. This plan should address the development and adoption of policies and standards needed for the delivery of care, the empowerment of individuals, and improvements in population health based on national health and health care priorities. Gaps in standards for data transport, data content, vocabulary and terminology should be identified and timelines for their evaluation and adoption included.

Significant effort should be made to reach out to and gain input from public and private sector organizations on health system priorities as well as necessary standards and policies, including those that already have widespread agreement.

A long-term data strategy will create certainty and enable long-term planning and investment by the many diverse actors within the health care system. Such a plan will also guide and support the work of the Health IT Policy and Standards Committees and the staff at HHS who work on such issues over the coming years.

3. *Gain Agreement on a Path Forward for Health Information Exchange.* As lessons emerge from existing health information exchange programs and initiatives supported by both the public and private sectors, and as incentives that support health information exchange solidify, public and private sector leaders should agree upon a path forward. Specifically, leaders should develop a common set of principles, policies and standards supporting the robust exchange of health data necessary for achieving the triple aim. Gaining agreement on a national strategy or path forward will accelerate action on the part of the private sector. The results of this effort should align with the long-term data strategy and plan called for above.

   This path should be informed by an independent assessment of the current state of health information exchange in the U.S., including the level and types of exchange occurring, and the lessons learned related to the economic, policy and technical aspects of exchange. This assessment should look across methods and programs.

   Diverse models of exchange should be considered, including those led by the public sector (at the federal or state level), the private sector (including those that are vendor-, provider- and community-led), and new models under consideration, including those that are consumer-mediated. This path should also be informed by considerable input from clinicians, clinics, consumers, employers, health plans, hospitals, laboratories, long-term care and home health facilities, pharmacies, vendors, states, and leaders of federal programs.

   Results of such work should be widely disseminated to inform health information exchange efforts across the U.S. These findings should also inform the work of the Health IT Policy and Standards Committees as they develop recommendations on federal policies and standards for health information exchange and future requirements of Meaningful Use.

4. *Gain Agreement on and Accelerate the Execution of Common Methods for Bi-Directional Health Information Exchange.* In addition to agreement on a long-term path forward, to support the needs of health care leaders who are implementing coordinated, accountable, patient-

centered models of care in the near-term, the private and public sectors should collaborate on the following actions:

a. Those whose active participation is needed to support the actual exchange of data in the field – clinicians, consumers, health plans, hospitals and other providers, laboratories, pharmacies, vendors, and federal and state agencies – should evaluate, define, test and adopt a common set of methods for the bi-directional exchange of standards-based, discrete data. This data should support care delivery, engagement of individuals in their own health, and improvements in the health of populations. Such work should be conducted in a way that aligns with the attributes of a "voluntary consensus body" as outlined in the National Technology Transfer and Advancement Act, including openness, balance of interest, due process, an appeals process and consensus.[88] Deliberations and results of such work should be publicly available.

   Federally adopted standards, specifications, and policies, as well as lessons learned and results from public and private sector initiatives focused on health information exchange identified above, should be leveraged to support this work. NIST should agree to develop and implement testing tools to support widespread implementation of standards that emerge from the process. The results of this work should be presented to and inform recommendations on federal policy and standards made by the Health IT Policy and Standards Committees.

b. To inform a national strategy on accurate patient matching, providers and vendors, working closely with patient groups and states, should collaborate with the federal government to conduct research on and share strategies, experiences, results, costs and lessons learned regarding accurate patient matching; develop a common set of requirements – including principles, policies and technical specifications – that address accuracy, privacy and security needed to build trust and widespread support; assess market availability of common requirements; and, should no national strategy emerge in the near-term, utilize the common set of requirements for individual and group purchasing arrangements to promote standardization, reduce medical errors and risks, drive down costs, and improve care.

5. *Build Awareness and Understanding of Federal Strategy and Programs Related to Health Information Exchange.* Many programs and initiatives included within ONC's multi-pronged portfolio approach to supporting health information exchange have been underway since 2009, and are now achieving results and lessons that will be helpful to advancing health information exchange. Beginning in 2012:

   a. ONC should clarify and raise awareness and understanding of the evolving federal policy strategy on health information exchange, based on evaluation of HITECH programs currently underway. At a minimum, ONC should articulate the role of the following federal programs in such efforts, including a description of health information exchange related requirements: the Meaningful Use Incentive Program; the Standards and Interoperability Framework and related activities; the ONC Certification Program; the State Health Information Exchange Cooperative Agreement Program; the NwHIN Exchange initiative; the "Direct" Program; the Query Health project; the Beacon Community program; and the Regional Extension Center Program.

   b. HHS should facilitate the public sharing of lessons related to health information exchange that have emerged from federal grantees and contractors – including those participating in the ONC programs identified above, as well as the State Medicaid Program and CMMI pilots – to support public and private sector efforts to accelerate health information exchange.

The Future of Health IT: The Out-of-Town Medical Emergency

Kevin's work as a sales rep requires quite a bit of travel. As he gets older – he's almost 60 – it gets harder and more tiring. His constant travel has affected his health: he doesn't eat right, doesn't sleep well and seldom gets regular exercise. He also knows he should quit smoking, but just hasn't. Lately he's been feeling more rundown than usual, and he's made a mental note to talk with his doctor about it when he's back home.

Eating breakfast in a hotel restaurant before a full day of sales calls, Kevin reflects on how tired he feels. The headache he woke up with seems to be getting worse, and he even feels a little dizzy. The waitress asks him a question, but he can't understand her. He tries to answer, but nothing comes out. With rising panic just before he loses consciousness, Kevin realizes he is having a stroke.

On the way to the hospital, one of the emergency medical technicians who responded to the hotel's 911 call finds Kevin's personal health card in his wallet. At the emergency room, the card is scanned and Kevin's medical history is electronically retrieved. This provides critical information to the emergency room staff about Kevin's drug allergies, the medications he is currently taking, and his health history, and allows them to quickly determine the safest and most effective course of treatment for him. With stroke patients, there is a narrow window of time for the most effective treatment to be given, so having quick access to this information is critical to Kevin's eventual recovery.

The emergency room doctor orders a CT scan and an EKG. Results from both tests are digitally available and are added to Kevin's record. An automatic alert is sent to Kevin's primary care doctor's office to inform them about Kevin's situation. A hospital staffer is also able to contact Kevin's wife with contact information available in his electronic health record (EHR).

After being successfully stabilized in the ER, Kevin is admitted to the hospital where he stays for four days, recovering well during that time. Upon discharge, he receives not only verbal instructions about post-hospital care and plans, but also a paper copy. At his request, an additional copy is automatically sent to his email account. A clinical summary of his hospitalization is electronically sent to his primary care physician's office.

When Kevin returns home, a care coordinator from his care team contacts him to see how he is feeling, to answer any questions, and to schedule a follow-up visit for the next day with his doctor. The care coordinator also electronically sends Kevin consumer-friendly information about post-stroke care, and about prevention and wellness strategies to improve his overall health – including details about a popular and effective smoking cessation program.

Kevin knows he is lucky to have recovered so well from such a serious medical event. He also recognizes that he is lucky to be part of a medical practice that enables timely and effective communication across the health care system, and between him and his care team.

6. *Clarify Existing Policies and Develop New Policies as Needed to Support Bi-Directional Exchange.* Building upon previous work, the Health IT Policy Committee should continue to gain input and develop recommendations associated with policy for robust health information exchange, including both the transmission of and access to standards-based, discrete data residing in multiple settings. As noted in the privacy and security section, the administration should consistently issue comprehensive and clear guidance on compliance with federal privacy and security laws covering personal health information, addressing access, use and disclosure of health information for treatment and population health purposes.

Aligning Federal Programs

The health care system is undergoing considerable change. Health care organizations are faced with numerous requirements associated not only with health IT, but also with delivery system and payment reforms, health care coverage and access challenges, administrative improvements, and program integrity brought about by ACA, HITECH and other federal, state and private sector programs. At the same time, they are working with limited resources due to budget cuts associated with the economic downturn and the lack of a sufficiently trained labor pool.

As noted already, it is a challenge for both large and small organizations to make EHR adoption and Meaningful Use a priority when they are also responding to other significant changes, including movement to a new coding system (e.g. ICD-10); new rules associated with electronic claims submission and other administrative transitions; the introduction of delivery system reforms including new performance measurement requirements; and other initiatives associated with health care reform and quality improvement.

The more effectively EHR adoption and Meaningful Use can support other efforts designed to improve care delivery and operations, the more likely it is that organizations will make the necessary financial and human investments in health IT. This linkage is particularly important for small physician practices and community and rural hospitals.

In particular, compliance with the multiple performance measurements required by various federal, state and commercial programs absorbs significant intellectual and financial resources. Health care leaders note that many of the current required measures have essentially the same objectives, but their slightly different specifications demand different methods and processes for calculation, requiring extra time and effort that could be more effectively used addressing gaps in performance.

Getting to accurate, compliant performance measurement requires the following activities, which demand significant investments of time and money:

- Thorough analysis of the rules, requirements (which are sometimes ambiguous and lack specificity) and adjustments to address the unique needs of electronic clinical data environments;
- Access to data that resides in multiple disparate systems within primary care practices, specialty practices, health plans, hospitals, laboratories and pharmacies, as well as with the individual patient;
- Data normalization (given the lack of current content standards adoption) and analytics to accurately calculate measurements using specifications that have not all been field-tested for feasibility; and
- Creation of new or revised workflows to assure that the appropriate data is collected at the right time and place. This not only requires significant analysis of systems and processes, but also training of clinical and administrative staff who can assure that systems are populated with the correct data on a consistent basis.

Gaining agreement among public and private sector health care leaders on a uniform set of specifications for a common set of baseline measures for coordinated, accountable, patient-centered care will considerably reduce the time and cost associated with performance measurement, while accelerating achievement of the triple aim. Clear, unambiguous, field-tested technical and data specifications that take into account rapidly emerging EHRs and other clinical systems should be established. These specifications should align with a common data model in addition to content and terminology standards adopted by the HHS secretary. Aligning measurement specifications that support payment and incentive programs with data standards will also enhance the business case for interoperability and standards-based health information exchange.

The Measurement Applications Partnership (MAP), a public-private partnership convened by the National Quality Forum, is currently providing input to HHS on measures for performance reporting, performance-based payment programs and other purposes. Recently, MAP issued a report that calls for a set of principles, including a standardized measurement data collection and transmission process across all federal programs and ultimately across all payers; the creation of a library of all data elements needed for measures; support for patient-centered measurement; and collection of data during the course of care when possible.[89]

Flexible platforms enabling the use of data for multiple purposes, including performance measurement, while effectively managing patient privacy and security, should be developed as health care data needs continue to evolve and grow.

In addition to the performance measurement capabilities described above, there are several other electronic data needs designed to improve the health of the U.S. population, including those related to public health, medical product safety and research. As the adoption of EHRs within the U.S. health care system increases, providers will increasingly be asked to support these efforts, which are sponsored by a multitude of public and private sector initiatives. These efforts largely require the same types of data across settings and time, but employ different policies, processes and methods to support access to and use of the data, resulting in additional burden. Development of a common set of principles, policies, standards and methods associated with the use of electronic data to support multiple population health-related needs will reduce burden and support achievement of the triple aim.

Recommendations to Promote Alignment Across Federal Programs

1. *Promote Alignment of IT Requirements Across Federal Health Care Programs.* Beginning in 2012, HHS, working closely with state and private sector health care stakeholders, should facilitate the development and execution of a set of action steps to align policies, programs and requirements associated with the use of IT for multiple federal programs, including those related to delivery system transformation, payment, public health, health care coverage and access, administrative improvements, and program integrity.
2. *Align Performance Measurement Activities.* To accelerate improvements in the cost and quality of care, the following steps should be taken to align and coordinate disparate public and private sector efforts requiring performance measurement for improvement and payment:

a. By no later than June 30, 2013, the federal government and private sector payers should review, align and agree upon uniform specifications for a core set of performance measures, enabling federally funded and private sector programs with the same measurement objective (e.g., care of patients with diabetes) to utilize the same metrics.

b. Specifications associated with performance measures should be unambiguous, field-tested and align with data standards that have been adopted by the HHS secretary with guidance from the Health IT Standards Committee and, if applicable, consistent with those required for certified EHR technology and Meaningful Use.

3. *Align Federal Health IT Programs with the Needs of New Models of Care.* Beginning in 2012, key elements of federal programs that promote the adoption and Meaningful Use of health IT under HITECH should be reviewed and, if necessary, adjusted (consistent with existing regulatory and implementation timelines) to directly support or have the flexibility to support new and emerging needs of delivery system and payment reforms. This includes:

   a. Meaningful Use and related standards and certification requirements should lay the foundation for new delivery system reforms. To maintain the flexibility needed to support innovations in care delivery, they need not include all new IT capabilities associated with new models of care, given many fall outside the scope of Meaningful Use.

   b. As noted in the section on health information exchange, standards and interoperability programs should accelerate activities associated with the bi-directional exchange of discrete data to support both care delivery and improvements in population health.

   c. Grantees under the State Health Information Exchange Cooperative Agreement Program should be encouraged to coordinate and align their efforts with state programs associated with delivery system and payment reforms.

   d. Implementation assistance programs, such as the Regional Extension Center Program, should encourage and enable flexibility for grantees and contractors to support health IT-enabled delivery system reforms, in addition to requirements associated with the achievement of Meaningful Use.

   e. Workforce development programs should integrate knowledge of attributes of high-performance and how health IT supports coordinated, accountable, patient-centered models of care.

4. *Continue to Develop and Clarify Existing Federal Policies Associated with the Use of Data for Population Health Purposes.* The federal government should accelerate both the development and clarification of policies associated with the use of electronic information for population health purposes, including those needed for delivery system reforms.

5. *Align Efforts Around the Use of Electronic Data for Population Health Purposes.* As the digitization of the U.S. health care system expands and the use of electronic data to improve population health continues to grow, a common set of principles, policies, standards and processes that effectively manage patient privacy and security, and that can be applied in a distributed fashion, should be developed through collaboration among public and private sector leaders. Such development will significantly improve the trust in, as well as the efficiency and effectiveness of, the use of health data to accelerate achievement of goals related to measurement and improvement of outcomes, medical product safety, public health, and research.

Appendix A

BPC would like to thank the following organizations that shared their experiences, insights and guidance on the attributes of high-performance in health care and the role of health IT in supporting those attributes:

- Banner Health
- Better Health Greater Cleveland, MetroHealth
- Billings Clinic
- Blue Cross Blue Shield of Massachusetts
- Colorado Beacon Consortium, Quality Health Network, Rocky Mountain Health Plans
- Community Care Physicians
- Dartmouth-Hitchcock Clinic
- Dean
- Denver Health
- Eastern Maine Medical Center
- Everett Clinic
- Fallon Community Health Plan
- Fairview Health Services
- Geisinger Health System
- Group Health Cooperative
- Hampden County Physician Associates, Accountable Care Associates
- HealthPartners
- Indiana Health Information Exchange/ Quality Health First Program
- Inland Northwest Health Services (INHS)
- Intermountain Health Care
- Kaiser Permanente
- Louisiana Health Care Quality Forum, Medical Home Initiative
- Marshfield Clinic
- Mayo Clinic
- Memorial Sloan-Kettering Cancer Center
- Monarch HealthCare
- MyHealth Access Network, Greater Tulsa Beacon Community
- New York-Presbyterian Hospitals
- North Texas Specialty Physicians
- Park Nicollet Health Services
- Partners HealthCare
- Seton Healthcare Family
- Sharp HealthCare
- Taconic IPA
- Texas Health Resources
- Greater Cincinnati Beacon Community, TriHealth
- University of Michigan Faculty Group Practice and University of Michigan Health System
- Vermont Blueprint for Health

Endnotes

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