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Before the Senate Committee on Communications and Technology on Health Information Exchanges

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Good morning Chairman Folmer, Chairman Farnese, committee members, and staff. Thank you for this opportunity to address the Communications and Technology Committee on the important topic of health information exchange.

I am Genevieve Morris, the Manager of Health Information Exchange Research and Programs at the eHealth Initiative (eHI). eHI is an independent, non-partisan, vendor neutral, non-profit affiliated organization. Our mission is to drive improvement in the quality, safety, and efficiency of healthcare through information and information technology. We advocate for the use of Health IT that is practical, sustainable and addresses stakeholder needs, particularly those of patients. Since 2001, eHealth Initiative has represented a diverse group of 200+ stakeholders in healthcare who are improving health and healthcare through information technology and information exchange. In addition, eHealth Initiative is the preeminent authority on health information exchange. For 8 years, we have been tracking the progress of over 250 state, regional, and community health information exchange initiatives. Beginning in 2010, we started tracking the progress of the 56 new entities which were formed within states.

I am especially happy to be here as a native Pennsylvanian born and raised in Lansdale in Montgomery County. My entire family are proud residents of eastern Pennsylvania, in particular my grandparents, both in their eighties, are longtime residents of Wilkes-Barre and Hatfield. Until recently I made my home in Delaware county serving as a Project Coordinator at the AmeriHealth Mercy Family of Companies. In that capacity I had the opportunity to be involved in the nascent stages of the Southeastern Pennsylvania Health Information Exchange. Through my work I know how important health issues are to Pennsylvanians and the need to improve policies that support quality health care.

With this context in mind, let me turn to my testimony today. I will be addressing the importance of health information exchange, examining its current landscape, identifying how states are organizing HIE. I will conclude with laying out the benefits and challenges ahead.

What is Health Information Exchange (HIE)

At the most basic, HIE is the act of transferring health information electronically between two or more entities including but not limited to providers, hospitals, labs, health information organizations, and government agencies. HIE can take place over any geographic area and can occur between entities using disparate systems. A health information organization (HIO) is a formal structure that facilitates and governs the exchange of health information. HIOs include: health information exchange initiatives, state designated entities (SDEs), regional health information organizations (RHIOs), integrated delivery networks (IDNs), and health data banks.

The Importance of HIE for Pennsylvania

Health information exchange has the potential to improve the quality, coordination, and efficiency of health care, and to provide financial savings to providers, payers (private and public), and patients. The benefits of health information exchange can be clearly demonstrated through the management of chronically ill patients. Care coordination for patients with chronic diseases would not only reduce health care costs by billions, but would increase Pennsylvanians' quality and length of life. The *Prescription for Pennsylvania Strategic* Plan notes that roughly half of all Pennsylvanians have at least one chronic disease (diabetes, pulmonary disease, asthma, heart conditions, etc.). Chronic diseases in Pennsylvania account for: 80 percent of all health care costs and hospitalizations; 76 percent of all physician visits; and 91 percent of all filled prescriptions[1]. Across the nation, 83 percent of Medicaid spending and 96 percent of Medicare spending is for the treatment of chronic diseases[2]. Most of this spending is due to poor care coordination, lack of evidence based care, and lack of patient involvement (including patient reminders). HIE is the infrastructure necessary to support improved care coordination, evidenced based care, and patient involvement, especially for those with chronic diseases.

Current Landscape

CMS Medicare and Medicaid EHR Incentive Programs

The CMS Medicare and Medicaid EHR Incentive Programs provide a financial incentive for the "meaningful use" of certified EHR technology, as defined by Congress, to achieve health and efficiency goals. Meaningful use means that a provider is using certified EHR technology in ways that can be measured significantly in quality and in quantity. The program provides incentives to eligible professionals and eligible hospitals that enroll in the program, by 2014 under the Medicare program and by 2016 under the Medicaid program. It should be noted that beginning in 2015, Medicare eligible providers who fail to meet Meaningful Use requirements will face a one percent reduction in their Medicare reimbursement. The reduction increases each year that a Medicare eligible professional does not demonstrate Meaningful Use, to a maximum of five percent. The final rule for Stage One of the Meaningful Use guidelines was released July 13, 2010. There is one HIE requirement for Stage One of Meaningful Use, intended to support improvement in care coordination:

- Objective: Capability to exchange key clinical information electronically (for example, problem list, medication list, medication allergies, and diagnostic test results).
- Measure: Eligible providers and hospitals must attest that they performed at least one test of certified EHR technology's capacity to electronically exchange key clinical information.
- The test of electronic exchange of key clinical information must involve the transfer of information to another provider of care with distinct certified EHR technology or other system capable of receiving the information. Simulated transfers of information are acceptable to satisfy this objective.

- The transmission of actual patient information is not required for the purposes of a test. The use of test information about a fictional patient that would be identical in form to what would be sent about an actual patient would satisfy this objective[3].

The preliminary Meaningful Use Stage Two requirements, currently under consideration by the ONC HIT Policy Committee, are intended to shift the emphasis from information capture and reporting toward greater exchange of information and improvements in outcomes. This heightened expectation for meaningful use can increase the need for HIE. The preliminary recommendation for HIE requirement for Meaningful Use Stage Two is an expansion on the Stage One requirement:

- Stage Two: Connect to at least three external providers in "primary referral network" or establish an ongoing bidirectional connection with at least one health information exchange[4].
- Given the requirement that the SDEs support the achievement of meaningful use, specifically supporting e-prescribing, receipt of structured lab results, and sharing of patient care summaries, the final objectives for meaningful use stage 2 may be revised to support eligible professionals and eligible hospitals that look for assistance from HIE in meeting the requirements.

Office of the National Coordinator State HIE Cooperative Agreement Program

The Office of the National Coordinator (ONC) was established in 2004 by Executive Order of President Bush. ONC is the principal federal entity charged with coordination of nationwide efforts to implement and use the most advanced health information technology and the electronic exchange of health information. The ONC State HIE Cooperative Agreement program facilitates and expands the secure electronic movement and use of health information among organizations according to nationally recognized standards. This program is a Federal-State collaboration aimed at the long-term goal of nationwide HIE among all health care organizations. The program is intended to ensure that every eligible health care provider has at least one option for health information exchange that meets the requirements of the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs, defined by the Centers for Medicare and Medicaid services (CMS). In addition to supporting providers in qualifying for Meaningful Use incentive payments, states and SDEs must address and enable the following capabilities in the next year: electronic prescribing, receipt of structured or organized lab results, and sharing patient care summaries across unaffiliated organizations[5]. To this end, ONC awarded cooperative agreements to States and State Designated Entities (SDEs). The total funding for this initiative is $5.47 million. Awards ranged from $600,000 to $38.7 million. ONC has approved 27 state HIE Strategic and Operational plans to date. The Cooperative Agreement program contains a state matching requirement as follows:

- FY 2010 – October 1, 2009 – September 30, 2010
  There is no state match requirement.
- FY2011 – October 1, 2010 – September 30, 2011
  One state match dollar is required for every ten federal dollars.
- FY2012 – October 1, 2011 – September 30, 2012
  One state match dollar is required for every seven federal dollars.
- FY2013 – October 1, 2012 – September 30, 2013
  One state match dollar is required for every three federal dollars[6].

Current HIE Field

Since 2004, the eHealth Initiative has tracked the progress of organizations across the country working on health information exchange. In 2010, the eHealth Initiative HIE Survey included information from 199 HIEs and state designated entities (SDEs). As of July 2010, there were 73 operational HIEs across the country. Operational initiatives are those HIEs currently transmitting data that is being used by stakeholders. Of those 73 initiatives, there are 18 that eHealth Initiative identified as sustainable. This means they are operational, not dependent on federal funding, and have broken even through operational revenue alone. Most states currently have at least one operational initiative, but many states do not yet have sustainable initiatives[7]. Known initiatives in Pennsylvania including HIOs and IDNs are:

- Keystone Health Information Exchange
- Northeastern Pennsylvania Health Information Exchange
- Southeast Pennsylvania Health Information Exchange
- University of Pittsburgh Medical Center
- Pinnacle Health System
- Six Bridges
- Harrisburg Health Information Exchange
- Doylestown Hospital

Over the four year period of the ONC State HIE Cooperative Agreement, States and SDEs, are expected to build plans that increase connectivity and enable patient-centric information flow to improve the quality and efficiency of care within the context of five domains established by ONC: governance, sustainability, technical infrastructure, business & technical operations and legal and regulatory issues. Following the awards to the SDEs, states have vigorously worked to develop strategic and operating plans that will facilitate statewide health information exchange. Central to the successful execution of these plans is the determination of the respective roles and responsibilities for the public and private sector stakeholders driving the health information exchange within the state.

ONC has given states significant latitude in organizing statewide HIE. As a result, states are selecting a service model that meets the needs of their state. In December 2010, eHealth Initiative studied the approved state strategic and operating plans for the white paper *Governance*

Models for Health Information Exchange[8] and categorized each plan into three organizational models that are the most prevalent among the cooperative agreement awardees: Centralized, Decentralized, and Hybrid. These models do not refer to the architectural infrastructure of the SDE, but rather the organizing service model. These models are best thought of on a continuum, and states are at various points on the continuum.

The centralized model consists of an SDE that acts as a health information organization (HIO) for the entire state. Some states have chosen an SDE that was an existing HIO, while others are building an HIO from the ground up. The SDE allows regional health information organizations (RHIOs), hospital systems, and individual providers to connect to their HIO, as well as public health and, potentially, Medicaid. In the centralized model, the SDE typically performs the following core services:

- Exchange of clinical and, potentially, administrative data
- Exchange of the continuity of care document (CCD)
- ePrescribing
- Medication history and reconciliation
- Delivery of lab results
- Management of a master patient index
- Record locator services
- Electronic eligibility and claims transactions
- Computerized Physician Order Entry (CPOE)
- Provider portal

A highly centralized model may be optimal for states with a small geography and a small number of providers and patients. Physically large states with large populations may have difficulty implementing a centralized system. In addition, a highly centralized model enables existing health information exchanges to build one interface rather than many. Examples of states choosing the centralized model include Wisconsin and South Carolina.

In the decentralized model, the SDE acts as a facilitator and a convener, setting policies and regulations. The SDE creates the environment for existing HIOs and hospital systems to connect to each other. In this model, the SDE typically provides grants to HIOs through a public Request for Proposal (RFP) process; the HIOs build the infrastructure of a statewide HIE. The HIOs must abide by the policies and terms of the contracts signed with the SDE, which normally include stipulations on interoperability (transferring data between disparate systems) and required services. The SDE provides no core services, but is responsible for policy creation. The SDE, however, is still ultimately responsible for creating statewide health information exchange, under the Cooperative Agreement Program with ONC, and may supply services through separate contracts to support areas not covered by existing HIOs.

The decentralized system is optimal for states that have well-established, sustainable health information exchanges that are already working together. However, the decentralized model can become incredibly complex, making it difficult to move toward the end goal of a single patient record. In addition, health information exchanges will have to create multiple interfaces in order to cover the entire state, which can become very costly. Finally, interstate coordination may be difficult in a decentralized model, and may lead to duplicative efforts by the health information exchanges or the state. As of December 2010, the only states planning to utilize the decentralized model were Texas and Indiana.

The hybrid model combines characteristics of the centralized and decentralized models. In the hybrid model, the SDE does not act as an HIO for the state, which means clinical data does not flow through the SDE. The SDE creates the policy framework and is ultimately responsible for implementing the statewide HIE, even though it is not the HIO. In the hybrid model, the SDE will enable health data exchange, yet how they accomplish this will vary. The extent to which a state provides the technical infrastructure and specific services via that technical infrastructure, and the extent to which it facilitates interoperability between existing HIOs and hospital systems, will be dependent on the circumstances and decision-makers within a given state. In the hybrid model, the SDE may supply future services that may capture data for analysis and reporting purposes. Within the hybrid models of the approved SDE plans examined, the SDE typically provides the following services:

- Master patient index
- Provider registry
- Patient and provider identity services
- Record locator services
- Consent management
- NHIN gateway
- Auditing services

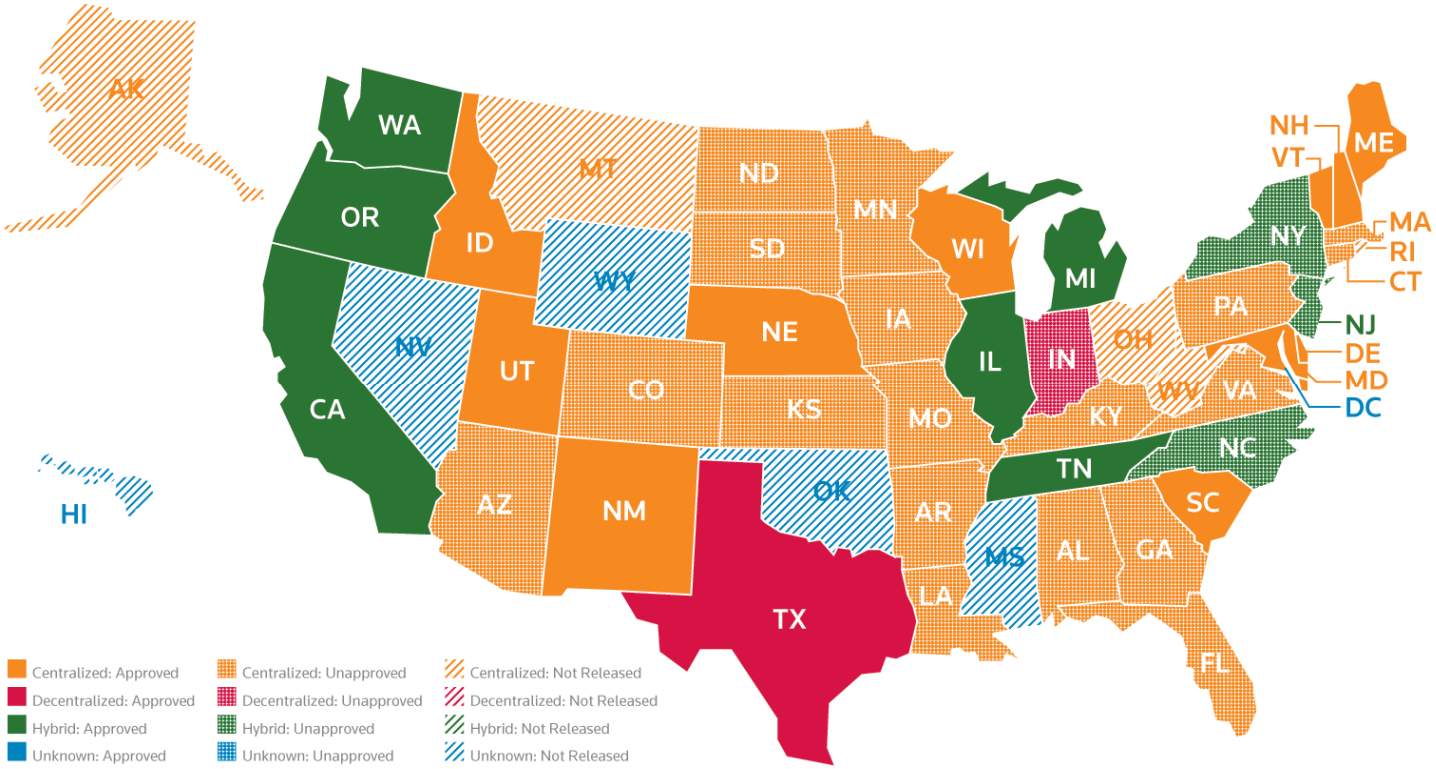
The hybrid model builds on existing infrastructure, but may require the health information exchanges to build multiple interfaces in order to connect the entire state. Also, some hybrid models do not offer core services, such as a record locator service or a master patient index. Consequently, health information exchanges and hospitals would have to perform these functions, incurring additional costs and creating a potentially complex system. Examples of states pursuing the hybrid model include Michigan and Tennessee.

States are considering the following when choosing which model they will adopt.

- **Geography** — requirements for building the infrastructure will vary based on the size of the state and the urban/suburban/rural composition. Whether providers working in multiple regions within a state are required to join multiple HIOs is a potential issue in a hybrid or decentralized model as well.

- **Trust Framework** — the level of cooperation and consensus that can be obtained will affect the model chosen. Determining who will manage patient consent, the state or the local HIO, is also critical.
- **Population Size** — the number of providers and hospitals, and the number of patients, can be complicating factors. A larger patient population may necessitate customization of services to meet unique needs, which might suggest a hybrid or decentralized model.

Below is a map, as of December 2010, of the models each state is choosing. Some states have not publicly released their plans and are noted in blue. The map shows that the predominant choice of states is the centralized model. This is particularly true in states that do not have an abundance of healthy HIOs.



Sustainability

Sustainability of HIE is vitally important to HIOs, states, and SDEs. While these groups are currently experiencing an influx of Federal funds, the funds will not cover total start-up expenses and will not last indefinitely. In addition, states must meet the matching funds agreement cited above. HIOs, states, and SDEs must seriously consider how they will remain sustainable once the Federal funds have been spent. eHealth Initiative completed a white paper in February 2011 on *The Path to HIE Sustainability*[9] and determined that the following revenue streams are viable options for HIOs and SDEs.

Grants – Public

A major source of funding, especially for startup and implementation, is public grants. The Health Information Technology for Economic and Clinical Health (HITECH) Act, part of the 2009 American Recovery and Reinvestment Act, provided for billions of dollars in funding for States and SDEs. In addition, the Centers for Medicare and Medicaid Services (CMS) has provided additional funding to states to support the adoption of health information technology (HIT) and HIE. CMS established a 90 percent Federal Financial Participation (FFP) match for reasonable state expenses, related to the administration of the incentive payments and to promote EHR adoption and health information exchange. Public grant funds are proving to be pivotal in helping SDEs to get up and running. The major public grant funds available to States and SDEs are: 1) the ONC State HIE Cooperative Agreement Program, 2) the ONC Challenge Grant Program, and 3) the CMS Medicaid EHR Incentive Program Funds.

Grants – Private

HIOs and SDEs often seek private funding for startup and implementation costs. The 2010 eHealth Initiative Annual Survey on HIE[10] identified some of the most common sources of private funding, which include: hospitals, payers (commercial), physician practices, and philanthropic sources. Employers are also beginning to invest in exchanges.

- Hospitals: With pending Meaningful Use requirements, easy access to physician networks, and efficiency demands, many hospitals realize investment in health information exchange is critical to their future. Hospitals are the most common source of start-up funds for exchanges.
- Payers: Many payers have been shown the value of investing in a community or state-run HIE. By investing in an HIE, rather than building HIEs themselves or relying on multiple hospital systems to build HIEs, they realize a large financial return on investment. Consequently, many payers have provided grants for capital expenditures to assist HIEs in implementation.
- Physician Practices: Similar to hospitals, and payers, many physician practices are beginning to recognize the value of investing in exchanges to improve quality and efficiencies, as well as meet upcoming requirements for Meaningful Use.
- Philanthropic Sources: There are numerous non-profit organizations that exist to improve healthcare quality, access, and efficiency. These organizations can be a valuable funding source for HIEs.
- Employers: Employers also receive a financial benefit from involvement in an HIE. The benefit is the potential for lowering insurance costs and improving employee health and attendance. These potential cost savings are beginning to encourage employers to partner with community and state-wide HIEs.

Another major source of funding for HIOs and SDEs is usage fees. There are two major types of usage fees: subscription and transaction fees.

Subscription Fee Model

Subscription fees can be charged to the data providers and users of an HIO. The subscription fees are a set amount that can be monthly, annual, or by type of service. The fees will typically vary by the size of an organization or be a tiered structure based on the number of services used. Subscription fees allow data providers and users to purchase a set level of access.

Subscription fee based models are often based on a monthly or annual set fee. This allows HIOs to lower the overall cost of participation, and therefore assist them with long-term planning. HIOs, in turn, will have more data providers and users participating in the HIE, thereby increasing revenue. In addition, the HIO's administrative costs will be lower, since they will not have to monitor and track individual transactions of any organization.

Transaction Fee Model

Transaction or "by the drink" fee structures charge data providers and users for each transaction which occurs in the exchange. Transaction fee arrangements can include fees for: clinical results delivered, covered lives (per member/per month), and licenses to use a particular software package over the internet.

There are a number of challenges in the transaction fee structure. The fees paid to the HIO are not always predictable; they vary based on usage. For large organizations, transactions can run into the millions/day, causing a potentially unreasonable expense for data providers and users. This may adversely affect usage of the HIO. Transaction fees are a fluctuating revenue source for HIOs; one month may yield a high number of transactions and therefore revenue, while the next month yields very little.

An important factor in sustainability is a steady revenue stream. The transaction fee structure may not provide HIOs the needed stability. HIOs also must consider the high administrative overhead needed to monitor and record all transactions and assess fees. This will diminish the revenue generated from the transaction fees. A benefit of the transaction fee structure is the potential for large revenue, if the participation hurdle can be overcome. However, it is not yet clear whether organizations will participate en mass in an HIO with a transaction fee structure.

Utility Model / Levies

Since HIE is a public good, similar to other public utilities, many states are considering utilizing taxes to support HIOs. Many states are beginning to explore this model because health information exchange provides such a significant "shared" benefit, since all the stakeholders benefit from the exchange. Rather than charge specific stakeholders for use, the public supports the exchange as common infrastructure. State governments may use various methods of taxation including: revenue based, per member/per month, transaction fees, or part of a provider or hospital's state licensure fee. For example, North Carolina is proposing a tax on provider, hospital, and insurance licenses.

A major funding stream that HIOs and SDEs are exploring are the services they offer, including clinical services, administrative services, payer value-add services, and provider value-add services.

Clinical Services

Many clinical services are basic services that a majority of HIOs and SDEs offer. These services tend to be considered core services, such as clinical messaging. Some services however, are offered by only a few HIOs, such as ePrescribing.

- Secure messaging – Facilitates the transfer of patient information between different stakeholders, such as providers and hospitals, thereby reducing cost and increasing quality of care.
- ePrescribing – Allows providers and hospitals to submit prescription requests electronically, thereby reducing errors and increasing efficiency. In addition, some ePrescribing systems report on fill rates, enabling providers to better manage patient care.
- Electronic Health Record (EHR)-Lite – Some community and state-run HIEs are offering an EHR-Lite option for providers who do not have an EHR system. The EHR-Lite is typically cloud based (hosted on the HIE's servers rather than installed in a provider's office), which reduces the cost for providers of implementation and ongoing maintenance and upgrades. It also allows the state-run HIEs to meet the ONC requirement that they support all providers in achieving Meaningful Use.
- Laboratory and radiology results delivery – The electronic delivery of lab and radiology results increases efficiency for providers and hospitals and the quality of care for patients. It also decreases the cost associated with faxing or mailing results and potential medical errors.
- Picture Archiving and Communication System (PACS) Reporting – Enables the management and distribution of medical images captured by multiple modalities (x-ray, CT, MRI, PET, and others). PACS Reporting has the potential to decrease the costs associated with medical errors and the current costs of sending images between providers and hospitals. In addition, it can reduce the costs associated with duplicative testing by providing physicians with access to prior images captured in another location.

Administrative Services

Administrative services are a revenue stream being considered by many HIOs and SDEs. This revenue stream is especially viable for SDEs that have the ability to connect with their state Medicaid Management Information System (MMIS). Administrative services being offered to providers and hospitals include the following:

- Claims processing – Allows providers and hospitals to submit claims electronically through a centralized mechanism. This service eliminates multiple claims submissions through different payer systems as well as paper claims.
- Eligibility verification including universal eligibility – Allows providers and hospitals to verify eligibility electronically, typically on one system rather than multiple systems or via fax or telephone.

- Prior-authorization – Allows providers and hospitals to submit prior-authorization requests through a centralized mechanism. This service eliminates paper and fax submissions for prior-authorization, decreases wait time for the authorization, and streamlines the request process.

The three administrative services above are not only beneficial to providers and hospitals, but are also beneficial to payers. When claims processing, eligibility verification, and prior-authorization services are performed through an HIO, payers and providers may not incur the additional financial burden of supporting additional software and hardware systems to perform these functions.

Payer Value-Add Services

The use of an HIO has the potential to lower licensing, maintenance, and operational fees that payers would incur, if they supported these services themselves. Some HIOs are offering the following value-add services for Healthcare Payers:

- National Committee for Quality Assurance (NCQA)/Healthcare Effectiveness Data and Information Set (HEDIS) Reporting – Allows payers to collect data through the HIO to support NCQA and HEDIS reporting requirements. Utilizing HIOs provides better data in a more timely fashion.
- Wellness programs and care coordination support – Payers can use wellness programs and care coordination support from HIOs to lower costs associated with claims payment. The HIE also allows payers to support increased care management by providing the care manager a complete picture of the patient.
- Patient education – HIOs can provide patient education, potentially through a portal. Education materials can include videos, brochures, articles, and tutorials that will assist patients in managing their care. When patients manage their care effectively, costs are reduced. Payers can utilize an HIO to provide this patient education eliminating the operating costs of providing the information themselves.
- Treatment cost calculators – Facilitates better management of consumer's own healthcare by identifying patients' costs associated with a specific treatment before care. Cost calculators allow payers to set consumer expectations and ultimately decrease unnecessary utilization.

Provider Value-Add Services

HIOs and SDEs are providing value-add services specifically for providers. These services increase the sustainability proposition of the HIO by solving business problems of the provider members that purchase them, a portion of which goes to extend ongoing support to the HIO.

- Quality reporting – Assists providers in participating in the CMS Physician Quality Reporting System (formerly PQRI) and hospitals in participating in the Hospital Quality Initiative program. This service can help providers record and report quality metrics to CMS, potentially increasing their incentive payment.
- Continuity of care applications – As the patient centered medical home model grows, providers will be looking for ways to provide continuity of care to patients. HIOs that

can offer applications that will allow providers to handle transitions of care will likely benefit.

Benefits of HIE

In today's health care system, patients no longer rely on their primary care provider for all of their medical care. According to the New England Journal of Medicine, the average Medicare patient sees seven different providers annually. The average patient with chronic conditions may see up to 16 providers annually, and 33 percent of all patients will change primary care providers annually11. With the increasing fragmentation of the health care system, the secure transfer of patients' health information becomes not only financially valuable, but necessary for the safety and quality of patients' care.

Health information exchange has the potential to generate financial savings. In the eHealth Initiative 2010 HIE Survey,[12] respondents noted that providers have been able to achieve 1) reduced staff time spent on clerical administration and filing, 2) reduced staff time spent on handling lab and radiology results, 3) decreased dollars spent on redundant tests (e.g., laboratory tests, radiology results), 4) reduced medication errors, 5) decreased cost of care for chronic care patients, and 6) reduced staff time spent on handling prescriptions. Respondents were not asked to quantify the amount of savings providers have received.

Examples of Potential Savings through HIE Utilization

The Deloitte Center for Health Solutions[13] completed a case study on the potential savings from improved management of Type II diabetes through health information exchange and a chronic care management program (CCMP). The model is based on the following assumptions for cost avoidance for HIE-enabled CCMP which reduces hospital admissions:

- Using estimates from 2005, the total cost of hospital admissions was $640 billion. Twenty percent of these admissions were diabetes related based on a primary or secondary diagnosis.
- Cost and length of stay for each admission was normalized. This is reasonable where the diagnosis on admission was heart failure or limb amputation resulting from unmanaged diabetes that had progressed to a near-fatal stage.
- Costs are calculated at net present value; that is, inflation-related costs are not considered in this model.
- The HIE has been fully implemented with a CCMP solution that includes the full complement of functions.

If HIE can reduce the cost of diabetes related hospital admissions by just 10 percent, the potential cost savings to the health system would be approximately $17 billion. If HIE can reduce costs by 20 percent, the cost savings increase to approximately $51 billion.

The case study also built a model for the reduction of emergency department uses based on the following assumptions:

- Using information from 2002, there was an average of 30,501 diabetes-related emergency room (ER) admissions per state, which equates to 1,525,050 ER admissions nationally.
- The average charge for each admission was $16,264, which totals $24,803,413,300 annually.
- Cost and length of stay for each admission is the same. Calculations are based on averages.
- Cost and cost savings do not take into account the rate of inflation. All calculations are based on 2002 valuations.

If HIE can reduce the cost of diabetes related emergency department visits by 10 percent, the potential cost savings would be approximately $2.4 billion. A 20 percent reduction in costs would bring a cost savings of approximately $7.4 billion. Please note that this study is model based, and is not based on actual clinical data.

HealthInfoNet in Maine commissioned a study in 2008 on the potential costs savings generated from a statewide implementation of HealthInfoNet. The study found that the potential savings, including savings from avoided laboratory and imaging services in the ambulatory and emergency room settings, ambulatory visits, and hospital admissions from the emergency room and the productivity benefits for clinicians and their staff, can total between $40.5 million and $52.8 million statewide[14]. The Office for Oregon Health Policy and Research and the Oregon Health Care Quality Corporation prepared a cost savings study in 2007 on the "Potential Impact of Widespread Adoption of Advanced Health Information Technologies on Oregon Health Expenditures." They found that the potential annual savings eventually achievable (ten years or more) for the tri-county area of Clackamas, Multnomah and Washington counties could be in excess of $20 million per year, with over $12 million per year achievable within five years. The sources of the savings included:

- Avoided duplicative services (visits, laboratory tests, imaging studies),
- Reductions in manual and paper processing,
- Non-routine paper processing,
- Physician productivity (more efficient use of physician's time)
- Practice office productivity (more efficient use of staff time) and
- Avoided time-loss for employees and employers[15].

In addition to the above financially quantifiable benefits, there are numerous additional benefits for providers, payers, and patients. The Taconic Health Information Network and Community, an HIE in New York, working with Weill Cornell Medical College found saw the following improvements in care over a 2 year period of sustained HIE use:

- 15.8 percent increase in lipid control among diabetics
- Five percent increase in glycemic control among diabetics
- 15.4 percent increase in appropriate antibiotic use[16]

Health information exchange has the ability to improve patient care by allowing providers to see the full longitudinal health record of a patient, without being dependent on the patient to remember all of the vital information. This record allows providers to perform medication reconciliation, drug/drug support, and drug/allergy support, which ensures patients will not be put on contraindicated medications by different providers, which can be fatal. Exchange of a continuity of care document or a discharge summary supports efficient and safe transitions of care and leads to increased follow-up visits and decreased test duplication. The exchange of immunization data from national registries to a provider's EHR will decrease duplicate immunizations. Giving patients electronic access to their care summaries and their longitudinal care records increases their participation in and ownership of their health care, and can lead to healthier habits. If 33 percent of patients change primary care providers annually, having a personal health record that can follow a patient to each new provider will ensure that each provider can give the best care to the patient, knowing his/her entire health history. Additionally, electronic public health reporting can prevent disease outbreaks by reducing the detection time from five to eight days to 48 hours or less, improving overall population health[17]. The benefits of HIE are currently difficult to quantify because of the infancy of the field. These studies are based on models and anecdotal reports. In the next few years, the financial benefits will be more readily quantifiable.

Challenges

While the benefits of health information exchange far outweigh the challenges, they do not negate the challenges. One of the biggest hurdles that HIOs and SDEs must overcome is the financial challenge of creating, implementing, and operating an HIO. Large infusions of capital dollars are required to build the infrastructure necessary for an HIO. The larger the geographic area of an HIO, the more capital dollars are necessary. In addition, there are general and administrative costs that are required for startup, implementation, and ongoing support of an HIO. While the ONC State HIE Cooperative Agreement funds are pivotal to helping states achieve statewide health information exchange, they are only a fraction of what is needed. No matter which model a state chooses to pursue, centralized, decentralized, or hybrid, large amounts of capital and general and administrative funds will be necessary to support the SDE and the HIOs within the state.

A second challenge HIOs face is around privacy and security, specifically the differing state and federal laws around protected health information, but also technologically outdated privacy rules. State and federal laws and regulations can be a confusing maze to navigate. Consequently, most HIOs must hire legal counsel to advise them in creating their privacy and security policies and their data sharing agreements, which can be a costly expense. State and federal privacy laws also lag behind technological capabilities. For example, some states require certain types of prescriptions to be submitted by the provider in writing, even though e-prescribing capabilities allow for digital signature and verification. HIOs face the added issue of perceived privacy

issues by patients. They must craft consumer education campaigns to engage and inform patients about the benefits and risk of health information exchange and persuade them to participate in the HIO.

A third challenge relates to HIE participation barriers. Adoption of EHR systems and HIE has been historically low; however, the CMS EHR Incentive program is meant to increase adoption. While most providers see the need for electronic medical records and HIE, overcoming the initial costs, changes to workflow, and initial slow-down of the practice is difficult. Providers and hospitals must see the value of an HIE before they will be willing to pay the participation fees. Value is realized through the availability and security of data. HIOs must ensure that they have data in their HIO that providers can access easily and securely. In the years to come, the participation barrier will slowly dissipate. Eventually, the health care system will reach a tipping point where patients will not utilize a provider or hospital that does not have an EHR and cannot electronically exchange their information. Additionally, new providers will move into a marketplace with advanced technology. When this tipping point is reached, the participation barrier will no longer be a challenge.

This concludes my testimony. My written testimony includes additional detailed information on health information exchange. I am happy to respond to any questions at this time, or any questions you may have going forward.

Thank you again for the opportunity to testify; it has been a great honor.

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