



CRISP

CHESAPEAKE REGIONAL INFORMATION
SYSTEM FOR OUR PATIENTS

The CRISP Response to the Request for Application for a Consumer-Centric Health
Information Exchange for Maryland

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The Health Services Cost Review Commission
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Introduction

Maryland's pursuit of a health information exchange (HIE) infrastructure has been marked by both challenges and successes. The challenges include those faced by virtually all healthcare stakeholders in the U.S.—poorly aligned incentives for many consumers and providers, concerns about privacy and security, interoperability shortcomings, and high costs of implementing and supporting health information technologies. Certainly, these challenges are not insurmountable, and the potential benefits warrant a collaborative, focused, and transparent approach to overcoming them. A 2006 report commissioned by the U.S. Department of Health and Human Services (HHS), which scanned a wide range of scientific studies and academic research, included in its findings that implementation of a comprehensive ambulatory electronic health records (EHR) improves quality of care. The HHS report suggested tangible clinical benefits from specific implementations of health information technology (HIT), such as adding various types of information related to laboratory test and prescription ordering to EHR ordering screens improved the quality of care and increased the efficiency of test ordering.¹ Within the context of widespread adoption and interconnectivity, such incremental improvements in timely and appropriate utilization, care quality, and cost, offer the prospect of transforming the American healthcare system more broadly, where spending on healthcare currently amounts to approximately 16 percent of gross domestic product (GDP), according to the U.S. Department of Health & Human Services' national health expenditure data.²

Maryland has many factors working in its favor for implementing a successful and valuable HIE. First, its relatively compact geography compared to other states can help mitigate some of the distance and communications challenges that some larger states' HIE efforts have faced. Second, because of its all-payer system and forward thinking HIT policymakers, the state enjoys relatively open lines of communication between government stakeholders and the private sector, as well as a track record of incremental progress on HIT issues. For instance, the Maryland Health Care Commission (MHCC) has to date convened two multi-stakeholder efforts:

1. The Task Force to Study Electronic Health Records, a legislatively mandated workgroup of 26 members studying key policy, privacy and economic issues facing EHR adoption and HIE in Maryland. The Task Force delivered its report to the Governor and the General Assembly in December, 2007.
2. The MHCC Privacy and Security Study to identify and analyze potential barriers to HIE from the perspective of various healthcare stakeholders.

The findings from these efforts of the MHCC have been brought directly to bear in this document, along with other findings from other initiatives of both the public and the private sector. In fact, this response is the culmination of nearly three years of discussion and collaboration among a wide range of stakeholders in the healthcare industry in Maryland. Individual members and participants of the now-formalized CRISP organization have played various roles in developing approaches for and facilitating discussion about HIE in Maryland. We believe that, in partnership with government stakeholders and other healthcare organizations, the approach articulated in this document constitutes the best and most pragmatic way forward for HIE in Maryland. Guided by the leadership of the MHCC, the HSCRC, and Gov. O'Malley, Maryland is now poised to make health information exchange, along with its myriad benefits, a reality for our citizens.

CRISP Background and Overview

CRISP is a not-for-profit membership corporation whose organizational members are Erickson Retirement Communities, Johns Hopkins Medicine, MedStar Health, and University of Maryland Medical System. The CRISP coalition grew out of conversations among the members exploring opportunities for cooperation to improve the

1 Shekelle et al. "Costs and Benefits of Health Information Technology" Agency for Healthcare Research and Quality (April 2006).
 2 "NHE Fact Sheet" (Centers for Medicare & Medicaid) http://www.cms.hhs.gov/NationalHealthExpendData/25_NHE_Fact_Sheet.asp#TopOfPage (July 25, 2008).

availability of electronic health information. As an informal, ad hoc group, CRISP received one of two planning grants from the state in early 2008 to begin the process of developing a framework for HIE in Maryland. It submitted a report to the MHCC earlier this year, along with the Montgomery County HIE Collaboration, the other planning group.

CRISP is a product of a commitment among Maryland healthcare leaders to address HIE and EHR adoption initiatives, with the ultimate goal of improving the quality of care in Maryland by facilitating the delivery of the right data to the right place at the right time within the confines of appropriate privacy policies. As CRISP has enthusiastically engaged in the challenge of planning a statewide HIE for Maryland over the last year, its participants have already established a working pilot HIE that focuses initially on one Use Case, the provision of medication history information to emergency rooms. This Use Case was selected because success is relatively easy to demonstrate and the data is readily available in electronic form. The expansion of the medication service will help build momentum for the acceptance of other Use Cases. In this way, we believe that HIE growth will be driven by clinical value and our ability to foster near-term, tangible results.

The Chesapeake Regional Information System for our Patients, Inc. (CRISP) is pleased to respond to the MHCC/HSCRC Request for Application: A Consumer-Centric Health Information Exchange for Maryland. Our response represents the culmination of many months of collaborative effort, and we hope will mark the beginning of many more.

In submitting the CRISP response, we submit that we are truly “shovel ready” to build the state’s HIE. CRISP was specifically founded and incorporated for the very purpose of building a statewide Health Information Exchange to serve the state of Maryland. The formalization of the CRISP organizational structure represents the culmination of several years of careful planning and bringing together a broad group of stakeholders.

CRISP is a Maryland-based team and has demonstrated the ability to gain consensus on the vision, mission, principles as well as the model for long-term financial stability of the Health Information Exchange that will work for Maryland. Our experience developing the “Plan for a Citizen-Centric Statewide Health Information Exchange in Maryland” is the thoughtful planning and the bringing together of local stakeholders that is the essential step to building a successful exchange.

The CRISP Vision

The CRISP Board of Directors has formally adopted the following vision statement:

Our vision is to realize measurable improvement in the health and wellness of Marylanders through the adoption and use of health information technology and the effective support of and cooperation with healthcare providers and citizens of our state.

The CRISP Mission

The CRISP Board of Directors has formally adopted the following mission statement:

Our mission is to advance the health and wellness of Marylanders by deploying health information technology solutions adopted through cooperation and collaboration. We will enable the Maryland healthcare community to appropriately and securely share data, facilitate and integrate care, create efficiencies, and improve outcomes.

Overview of the CRISP Approach

The CRISP approach is based on the decades of experience of its members with the policy related, technological, financial, and organizational aspects of healthcare and health information technology within Maryland. The enumerated points below outline how CRISP proposes to undertake an HIE in Maryland. These points are elaborated upon in the remainder of the response.

1. CRISP will utilize a hybrid technology approach, maintaining confidential healthcare data at the participating facilities and providers, with an option for the consumer/patient to ask for his or her information to be held in a health record bank account that he or she controls. The HIE will be used as a secure and trusted conduit rather than a centralized repository.

There are three general models for an HIE. The centralized model stipulates that all participants' medical records will be kept in a central repository (database), under the control of the HIE and out of the direct control of participating entities. This first model has not gained popularity, especially due to privacy concerns. The second approach, sometimes referred to as the federated or distributed model, keeps the data at its source facilities or with providers and uses the HIE as the conduit for sharing. In the federated model, the HIE also provides a roadmap for properly routing information to the appropriate location. The third model employs a Personal Health Record under the control of the patient, and does away with HIE services such as master person index (MPI) and Registry. The CRISP HIE will utilize a hybrid of the second and third model. We propose maintaining a central MPI and a registry of the location of electronic health records within the system. The hybrid model also allows the centralization of records when directed by consumers, as discussed below. These functions do not constitute a centralized record, but rather directory information to allow records to be identified and located throughout the distributed system. This hybrid model, CRISP believes, is less threatening to participants and individual patients because it is less disruptive to existing, trusted relationships between individuals and their care providers and, concomitantly, raises far fewer regulatory issues in today's privacy- and security-focused regulatory environment.

2. CRISP will allow consumers to have access to and control over their health information through health record bank and personal health record applications.

Health record banks (HRBs) and personal health records (PHRs) established by health plans, health systems or commercial enterprises such as Google, Microsoft, or smaller businesses are applications for storing consumer-controlled copies of patient health information. CRISP's HIE will integrate with PHR applications that meet appropriate technology standards. Information in a PHR may be generated directly from the records of healthcare providers or may be entered by the patient. While records from a PHR may not be assigned the same value by providers as hospital- or physician-generated records, because they may be altered by the patient, PHRs allow individuals virtually complete control over their own information and how to share it. For many consumers, this will likely be an attractive option.

For instance, if an individual is not willing to permit all healthcare providers to view his or her information, the individual can limit access to information stored in the PHR to only those healthcare providers he or she has specifically authorized. We believe that for consumers concerned about the privacy and security of their information, this furnishes an easy entry point for participation in the HIE and opportunities for generating clinical value and efficiency. We also expect that, once the benefits of an HIE are experienced, most individuals will opt for greater participation.

3. CRISP will allow individuals to have freedom to participate or not to participate in the HIE.

CRISP is committed to the concept that individuals have the right to be informed of their provider's access to and use of the exchange. Consumers must also be able to opt-out of participation entirely. If a consumer elects to opt-out, providers will not have the ability to exchange that consumer's information. Individuals will be informed of their right not to participate through an intensive public awareness campaign about the HIE and consumers' rights related to it. CRISP will also implement a simple and visible opt-out process at each point of care within HIE-participating healthcare providers.

4. **CRISP will build an HIE that is consistent with emerging national technology standards.**
The CRISP HIE will be based on federally-endorsed standards and integration protocols that bridge proprietary boundaries. Making this a core HIE principle will, CRISP believes, not only ensure that the HIE is not vulnerable to vendor selection issues and risks but is also compatible with HIEs being developed through other state and federal initiatives.
5. **CRISP will act now but build incrementally.**
CRISP will pursue an incremental growth strategy, building from individual Use Cases—individual HIE services that have a demonstrated need and demonstrable clinical value to patients and care providers. The alternative, implementation of an HIE that immediately seeks to provide widespread exchange of all health information to care providers, in CRISP's view runs many risks. Chief among those risks is setting such high initial technological and user acceptance thresholds that the HIE misses the current window of opportunity. Our incremental approach is already underway with the first Use Case, the provision of medication information to the emergency rooms of participating facilities.
6. **CRISP recognizes that EHR adoption among physicians is crucial to HIE success.**
CRISP understands that the current low adoption rate of EHRs by private physician practices in Maryland cannot be ignored when considering the potential value of an HIE. Approximately 80 percent of physician practices in the state have yet to adopt electronic health records. Without more ubiquitous adoption, sustainable value cannot be readily derived from an HIE. CRISP is convinced that any successful HIE should include, at minimum, a provider portal for web-based access into HIE-transmitted health information and would preferably include a clear pathway for physician practices to migrate easily from an inquiry portal to an entry-level EHR (with limited functionalities such as e-prescribing and clinical messaging) to a fully-functional, integrated and certified EHR. Federal and state legislation aimed at boosting and incentivizing EHR adoption will aid in CRISP's success.
7. **CRISP will develop a financially sustainable HIE.**
A successful HIE is one that can sustain itself financially for the long term and is not reliant on long term public or grant support. CRISP believes that its Use Case approach supports this important goal.
8. **CRISP will ensure focus on the medically underserved.**
Amid the inherent challenges of HIE, underserved populations must not be overlooked. The CRISP team will ensure that resources and focus remain directed to this particular component of the overall HIE effort, as it represents an important part of the solution and a key part of the quality, access and cost challenges in healthcare.

In summary, CRISP believes that a Maryland statewide HIE requires a technical approach that is flexible, a policy and privacy approach that is protective yet not prohibitively restrictive, and a financial approach that is sustainable. CRISP believes HIE success hinges on provider inclusion in the HIE deliberation and decision-making process. Health information exchange success in Maryland cannot be developed in isolation from the realities of our healthcare system, however progressive its policies or advanced its technology; rather, HIE success will ultimately require that all constituents using the exchange engage with its development. By pursuing the strategies outlined above, and discussed in detail in the remainder of our response, CRISP will create a valuable resource for the entire Maryland healthcare community. The known and yet-to-be discovered benefits of health information exchange, and more broadly, health information technology, will enable opportunities to improve quality, increase safety and ultimately decrease the cost of healthcare in Maryland.

CRISP Principles

The CRISP principles outlined below were developed through in-depth research conducted by CRISP team members of HIEs around the country; robust knowledge of and insight into the Maryland healthcare landscape; and an understanding of, and agreement with, MHCC articulated goals and principles. They have remained largely unmodified and have served us well throughout deliberation and debate on complex questions of policy, technology and finance, underscoring the framework by which the CRISP participants believe an HIE in Maryland can be successful. Furthermore, CRISP agrees with and accepts the principles outlined in the RFA document. These principles are incorporated into our guiding principles below as well as throughout our response.

Begin with a manageable scope and remain incremental

A fundamental component of the strategy defined in this proposal is the adoption of an incremental approach for the implementation of HIE services referred to as Use Cases. The CRISP HIE will begin with services that have the clearest clinical value and technical achievability and that fit within the privacy and security framework defined in this report.

Create opportunities to cooperate even while participants still compete in other ways

CRISP recognized early that in order for an HIE to be successful it must not seek to eliminate information technology as a strategic advantage but rather must embrace competition between organizations. On the other hand, patient health information itself must not be treated as a competitive advantage. HIE can indeed create new forms of competition at the same time that it helps to improve patient safety and the quality of care.

Affirm that competition and market mechanisms spur innovation and improvement

While the exchange will seed the market with core HIE services, referenced in this document as Use Cases, commercial businesses must have the ability to offer the healthcare community applications and services that can build on and leverage the exchange infrastructure. Ultimately, this approach will improve the quality and relevance of service offerings and build towards sustainability.

Promote and enable consumers' control over their own health information

Consumer access and control is a key component of the CRISP approach to HIE in Maryland. This control allows the healthcare community to engage consumers in new ways, building towards a consumer-centric healthcare model and empowering consumers to engage in the day-to-day management of health and wellness.

Be flexible to support both distributed and record bank models

CRISP does not believe that a single HIE architecture model has been widely accepted as an industry-standard, preferred solution. To ensure the Maryland HIE has the ability to adapt to a changing technical and policy environment and to evolving demands from consumers, the HIE infrastructure will be able to support both a distributed data model and a consumer-driven centralized model.

Use best practices and standards, particularly as they relate to privacy and security

In an environment rife with interoperability challenges, the CRISP HIE will continually review and ensure adherence to generally accepted best practices and standards as they evolve and will respond to federally-endorsed standard and other requirements.

Serve the entire Maryland healthcare community and population equitably

Successful implementation of an HIE in Maryland will demand serving the entire healthcare community rather than only specific hospitals, physicians' practices or other healthcare organizations. Success will also depend on the exchange's availability to, and adoption by, all citizens of Maryland, including the medically underserved. Access to CRISP exchange services will not only focus on metropolitan areas but also seek to be inclusive of rural areas as we expand HIE services both geographically and organizationally.

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Financial and Sustainability Models

Approach Overview

Before the first contract is signed, the first server is racked, or the first software is installed, it is necessary to identify all sources of revenue from startup to sustainability. Our goal of identifying revenue sources is informed by a number of factors, including:

1. Any investment of state monies will be leveraged to achieve a sustainable business model. Ongoing state funding is not an assumption that we have used as a means of continued operations.
2. When considering the potential benefits achieved through the HIE, it is necessary to discount those benefits based on risks associated with achieving the benefits.
3. Participants in the exchange will be willing to pay fees relative to the value that their particular institutions are gaining from the exchange. We should not assume participants will pay fees for value associated with the “greater good” or “community benefit” or “improved health.”
4. While potentially available for future projects and expansions, ongoing grant funding is not certain enough to include in a financial model.
5. Revenue should not be sought disproportionately from any one stakeholder or group of stakeholders.
6. Transaction fee models do not incent adoption of HIE services, and, in fact, can be a deterrent.
7. Subscription fee models incent higher utilization of HIE services and, if properly developed, can provide stability in revenue planning.
8. Financial incentives for EHR adoption, which have been legislated at both the state and federal level, will improve the economic case for physicians and facilities to participate in the HIE, especially if “meaningful use” rules define HIE connectivity as being important.

To arrive at reasonable revenue estimates that met all of these criteria, CRISP followed a model established by eHealth Initiative (eHI) entitled “Health Information Exchange: From Startup to Sustainability” and the accompanying toolset released by the U.S. Department of Health and Human Services and Health Resources and Services Administration on May 22, 2007. These materials, developed under a grant from the Office for the Advancement of Telehealth, provide a template for planning and implementing HIEs that will be sustainable over the long-term. The eHI report draws on the experience of several organizations and projects, including:

- Health Bridge of Cincinnati, Ohio, which implemented an HIE for order entry, eligibility verification, portal services, and clinical messaging
- IHIE of Indiana, which implemented an HIE for clinical messaging
- THINC of the Hudson Valley in New York, which implemented an HIE for hosted EHRs

Revenue Sources

After evaluating the funding models employed by other HIEs, CRISP opted to go with a model that began with a \$10 million investment of state funds, and then relied on participant subscription fees to achieve financial sustainability. The implication of this approach is that the initial investment must be used to build not only the core infrastructure, but also enough early services or Use Cases to justify the expense of fees from participants.

Outside of state funding and subscriptions fees, CRISP has also relied on philanthropic funding from The Erickson Foundation to support the medication history service and other HIE planning efforts. However, CRISP is not planning for philanthropic funding to continue. The financial models in this document demonstrate sustainability after the \$10 million investment, without additional investment by the state or philanthropic sources. However, CRISP believes that the HIE services could be implemented more broadly, the adoption could be more rapid, and the breadth of clinically valuable services could be increased if additional investment is made. CRISP will seek additional funding from government and philanthropic sources, beyond the initial \$10 million.

Strategy to Secure Additional Public Investment

CRISP believes that significant opportunities exist for federal funding through the American Recovery and Reinvestment Act (ARRA), particularly portions of ARRA identified as the HITECH Act. To date, CRISP has taken a number of steps to become visible within HHS Office of the National Coordinator (ONC) and among the ONC's Federal Health Architecture (FHA) team members. CRISP has also widely distributed our planning report with the intent of socializing our concepts and to receive feedback from various members of the health IT community. Feedback has been overwhelmingly positive and the report has received significant attention for its pragmatism and approaches to technology, policy, and financing. CRISP believes that a designation as the statewide HIE will position the entity well for federal funding. Working closely with MHCC and other Maryland agencies, CRISP believes that we will be able to communicate our plan and our ability to execute effectively to federal decision makers to ensure we are viewed as an extremely strong candidate for funding. However, taking a conservative posture, our current financial planning approach does not incorporate further public funding. CRISP has conducted financial planning exercises, not included in this response, that model how the organization would modify its approach and timelines in light of additional public/federal investment.

Budget

The budget is comprised of core infrastructure costs—including the hardware and software costs that are not unique to a specific function but are rather required to create the exchange as a whole—the cost of the exchange platform and portal license, and the enterprise master patient index. The budget also includes the cost of human resources to implement and maintain the exchange. As with the individual service costs, a 3.5% annual inflation rate has been assumed for all ongoing core infrastructure costs. In addition to direct human resource costs, which include salary and benefits, a 10% overhead factor has been added to cover office space, computers, office supplies, etcetera, as detailed below.

Of note, the unit cost for the resources needed to implement are higher than the unit cost for the permanent resources needed in subsequent years to maintain the HIE. This is due to the fact that implementation resources generally require a highly specialized skill set, as well as the fact that while the maintenance staff is envisioned to consist of full-time employees, the implementation staff will include contractors with finite engagements. Furthermore, not all permanent resource roles will be filled immediately. In years one and two, only three full-time permanent staff members are envisioned. The full-time staff is increased to seven in the third year as the permanent staff takes over duties from consultants and assumes maintenance responsibilities. Staffing could increase further in later years, depending upon the volume of supported transactions and services.

Put together, the core infrastructure costs and the marginal income from HIE services yields the anticipated cash flow from the HIE in each of the first seven years of operation. The first year outlay of about \$4.6 million drops to \$3.4 million in year two, and continues to drop until year five when the HIE becomes self-sustaining. Total startup investment in the HIE, spread over the first four years of implementation, is just under \$10 million. The maximum income reached in the out years would eventually start to erode because we have assumed inflation for everything except the pricing charged to participants. Long-term sustainability will require periodic examination of and increases to participant fees.

The following table illustrates the core infrastructure costs and cash flow to/from the HIE, operating under the \$10 million investment cap model (costs and revenue from use cases that roll into the Marginal Income/(Loss) from the HIE Services line can be found in the Use Case section):

Core Infrastructure	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Exchange Platform and Portal License	1	(\$2,500,000)	(\$1,500,000)	(\$1,000,000)	(\$600,000)	(\$621,000)	(\$642,735)	(\$665,231)	(\$688,514)
EMPI	1	(\$350,000)	(\$350,000)	(\$140,000)	(\$144,900)	(\$149,972)	(\$155,221)	(\$160,653)	(\$166,276)
Hardware/Supporting Software	1	(\$500,000)	(\$500,000)	(\$166,667)	(\$172,500)	(\$178,538)	(\$184,786)	(\$191,254)	(\$197,948)
Implementation Resources	8	(\$230,000)	(\$1,840,000)	(\$1,840,000)	\$0	\$0	\$0	\$0	\$0
Permanent Resources	7	(\$125,000)	(\$375,000)	(\$388,125)	(\$937,322)	(\$970,128)	(\$1,004,083)	(\$1,039,226)	(\$1,075,598)
Overhead (10% of resources)			(\$221,500)	(\$222,813)	(\$93,732)	(\$97,013)	(\$100,408)	(\$103,923)	(\$107,560)
Total Core Costs			(\$4,786,500)	(\$3,757,604)	(\$1,948,454)	(\$2,016,650)	(\$2,087,233)	(\$2,160,286)	(\$2,235,896)
Marginal Income/ (Loss) from HIE Services			\$222,000	\$368,316	\$253,271	\$1,770,189	\$2,918,026	\$3,837,585	\$4,554,673
Cash Flow			(\$4,564,500)	(\$3,389,288)	(\$1,695,184)	(\$246,461)	\$830,794	\$1,677,299	\$2,318,777
NPV		-\$5,740,014							
IRR		-15%							

It should be noted that while the Net Present Value and Internal Rate of Return are negative from a strict financial perspective at the aggregate level, the investment of \$10 million leads to a sustainable business model that is driven by multiple use cases that carry significant benefit to participants, as can be seen in the following table:

Net Present Value By Use Case	
Lab Results Delivery	\$2,199,755
Medication History	\$494,635
Emergency Department/Hospital Discharge Summaries	(\$214,221)
Clinical Summary	\$3,862,138
Radiology Results	\$2,736,374

Key to the development of this cost model was a series of assumptions about the fees various participants would be willing to pay for services offered through the HIE, and how fast those services could be deployed and subsequently adopted by the user community. The following table depicts those assumptions:

Model Assumptions	Adoption Rates								
Use Case/z	Subscription/ Month	Assessment Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
National Lab Results Delivery	\$10	per doc	30%	50%	70%	90%	90%	90%	90%
Hospital Lab Results Delivery	\$2	per doc	0%	10%	30%	50%	70%	90%	90%
Local Lab Results Delivery	\$3	per doc	0%	10%	30%	50%	70%	90%	90%
ED/Hospital Discharge Summaries to Physicians/Clinics	\$10	per doc	0%	0%	30%	50%	70%	90%	90%
ED/Hospital Discharge Summaries to ED/Hospital	\$1,000	per facility	0%	0%	30%	50%	70%	90%	90%
Clinical Summary to Emergency Departments	\$2,000	per facility	0%	0%	30%	50%	70%	90%	90%
Clinical Summary to Physicians/ Clinics	\$10	per doc	0%	0%	10%	30%	50%	70%	90%
National Radiology Results Delivery	\$5	per doc	0%	30%	50%	70%	90%	90%	90%
National Radiology Results History	\$1,000	per facility	0%	30%	50%	70%	90%	90%	90%

Hospital Radiology Results Delivery	\$1	per doc	0%	0%	10%	30%	50%	70%	90%
Hospital Radiology Results History	\$350	per facility	0%	0%	10%	30%	50%	70%	90%
Local Radiology Results Delivery	\$2	per doc	0%	0%	10%	30%	50%	70%	90%
Local Radiology Results History	\$650	per facility	0%	0%	10%	30%	50%	70%	90%
Max Subscription - All Services	\$43	per doc							
Max Subscription - All Services	\$5,000	per facility							

Operating Costs Statement

Salaries

CRISP has identified three positions that it expects to staff with permanent / non-contractor resources at the outset of the implementation project: the President, the Director of Outreach, and an Administrative Assistant. Exact compensation for the President's position will be negotiated by the CRISP Board of Directors. Compensation for the other positions will be negotiated by the President, in consultation with the Board. It is anticipated that the average salary of permanent CRISP resources will be \$100,000 in the first year; an increase of 3.5% is anticipated in successive years.

As noted in the finance and sustainability section, many of the technically-qualified system implementation and integration resources will be contracted by CRISP at an average billable rate of approximately \$115 per hour. Certain of these resources will be procured from Maryland-headquartered small businesses.

Benefits

Benefits for permanent resources will include family medical insurance coverage. CRISP has estimated benefits and taxes to amount to 25% of payroll. All benefits and taxes for contract positions will be the responsibility of the relevant contractor.

Rent, Utilities, Office Expenses, and General Overhead

We have identified a budget for office expenses, rent, utilities and other overhead that amounts to approximately 10% of 'people costs.' The overhead budget can be further broken down as follows:

Overhead Items	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Rent	\$36,000	\$37,260	\$38,564	\$39,914	\$41,311	\$42,757	\$44,253
Utilities	\$24,000	\$24,840	\$25,709	\$26,609	\$27,541	\$28,504	\$29,502
Outreach and Communication	\$60,000	\$60,000	\$7,500	\$7,763	\$8,034	\$8,315	\$8,606
Legal Services	\$85,000	\$85,000	\$8,000	\$8,280	\$8,570	\$8,870	\$9,180
Liability Insurance	\$12,000	\$12,420	\$12,855	\$13,305	\$13,770	\$14,252	\$14,751
Office Expenses/Other SG&A	\$4,500	\$3,293	\$1,104	\$1,143	\$1,183	\$1,224	\$1,267
Total Overhead	\$221,500	\$222,813	\$93,732	\$97,013	\$100,408	\$103,923	\$107,560

Outreach and Communication activities

CRISP has budgeted approximately \$60,000 per year in years 1 and 2 for Outreach and Communications and \$7500 in year 3, with an anticipated increase of 3.5% per year in successive years.

Upon award, CRISP will develop a forward-looking marketing strategy document and communication plan with the following goals in mind:

- Position Maryland as a leader nationally among state HIE efforts
- Coordinate effectively with the constituents' marketing and communication departments to maximize exposure and streamline outbound message

- Articulate the mission, vision, and value proposition to consumers in simple, compelling terms through a range of channels
- Provide transparency into the organization
 - To build public and constituent trust
 - To fend off challenges from competing interest groups
- Leverage grassroots support of “promoters” among affected patient populations
- Coordinating public-facing and provider outreach strategies
- Outreach and communication activities may include:
 - Website development and production, including a CRISP blog
 - Press releases and cultivation of relationships with media sources
 - Email marketing
 - Opinion pieces placed in state news outlets
 - Events (media and consumer)
 - Patient surveys and grassroots marketing
 - Coordination with help desk
 - Crisis communications

Outreach and communication is an area in which additional financial resources could allow for acceleration.

Software purchase and maintenance

\$1,500,000 is budgeted for Exchange software licenses in the first year; \$1,000,000 is budgeted for licenses in the second year; \$600,000 is budgeted for software in the third year, with an anticipated increase of 3.5% in each successive year. If open source software, such as that provided by the Office of the National Coordinator’s Federal Health Architecture group were to be selected, this budget would clearly change. However, an open source selection would likely increase systems integration costs.

Hardware purchase and maintenance

To the extent that CRISP must acquire computer hardware, installation and maintenance will be contracted for from a local Maryland institution, and hardware will likely be leased via an agreement with the service provider. CRISP has budgeted \$500,000 in the first year for the contract to provide all hardware and supporting software for the exchange. The hardware and supporting software budget for the second year is \$166,700, with an anticipated increase of 3.5% in each successive year.

Taxes

CRISP estimates that payroll taxes borne by the organization will amount to approximately 9% of payroll. CRISP has estimated benefits and taxes for permanent resources will amount to 25% of payroll or \$25,000 per resource in the first year, with an anticipated increase of 3.5% in each successive year. All benefits and taxes for contract positions will be the responsibility of the relevant contractor.

CRISP expects to operate at a loss through an anticipated breakeven point in year five. We are applying for status as a 501(c)3 organization, and we do not expect to have any obligation for income taxes.

Legal Fees

CRISP has budgeted \$85,000 per year in years 1 and 2 for legal services and \$12,500 in year 3, with an anticipated increase of 3.5% per year in successive years.

Legal service provided will include:

- Exchange Policy review
- Drafting and review of Exchange participation agreements
- Drafting and review of Contractor / service agreements

Liability insurance

CRISP will procure Directors and officers insurance, and it will procure both general liability and workers compensation insurance upon award. CRISP has budgeted \$12,000 per year for insurance in the first year of operation with an anticipated increase of 3.5% per year in successive years.

Statement of Cash Flows

We assume in our model that all of the services and infrastructure required to build the exchange are not acquired as assets, but rather, leased or sourced as a service. Depending on the timing of the availability of funds from the HSCRC assessment, lines of credit may need to be established to fund current operations. Should that happen, there will be minor impacts to this cash flow statement, however that is not anticipated at this time.

Cash Flow from Operations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Beginning Cash	\$0	\$5,435,500	\$2,046,212	\$351,028	\$104,567	\$935,361	\$2,612,660
Net Earnings	(\$4,564,500)	(\$3,389,288)	(\$1,695,184)	(\$246,461)	\$830,794	\$1,677,299	\$2,318,777
Additions to Cash							
MHCC/HSCRC Grant	\$10,000,000	\$0	\$0	\$0	\$0	\$0	\$0
Subtractions from Cash							
	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cash Flow per Year	\$5,435,500	\$2,046,212	\$351,028	\$104,567	\$935,361	\$2,612,660	\$4,931,437

Break-Even Analysis

The CRISP model illustrates a break-even point in the fifth year of operation, given the aforementioned assumptions. Break-even may occur sooner or later if implementation and adoption is accelerated or delayed.

Return on Investment

The net present value of the seven year model is -\$5,740,014 and the ROI is approximately -15% annually through seven years, excluding benefits accrued to exchange stakeholders. Beyond the seventh year, assuming no additional investment, we expect the exchange to produce substantial income which can be used to fund further services. While the initial ROI is negative at the HIE level, sustainability is achieved by offering services to stakeholders that clearly demonstrate value:

Stakeholder 5-year Net Present Value	
Primary care Physicians and clinics	\$40,968,514
Emergency Departments and Hospitals	\$7,304,387
Laboratories - Local	\$4,066,603
Radiology Centers - Local	\$356,499
Net Value - HIE Participants	\$52,696,003

Community Benefit

One of the greatest challenges in sustaining HIE efforts is answering the question “What are the benefits, and to whom do they accrue?” From a project sustainability perspective, we believe we have demonstrated sufficient hard savings that accrue to participants to justify their ongoing payment of subscription fees. However, the larger and more important question relates to the magnitude of anticipated health improvements, from both quality and cost perspectives. Because there are no precedents available to inform our modeling, CRISP will define an approach of clearly measureable impact metrics that can be tracked over time. While the execution of this measurement approach will require availability of data and analytic tools, CRISP will seek to partner with entities in Maryland to achieve these goals.

We believe that increased availability of information about patients’ previous medical care will lead to improvements in quality and efficiency of care. There are metrics available to help us measure those improvements. One of the benefits

of having such broad representation in the management (at the Board, Advisory, and staff level) is that CRISP has deep experience and interest in measuring these impacts. While the actual metrics to be utilized will be developed in discussion with our governance, broad areas of measurement could include:

1. Process outcome measurements for standard guidelines—e.g., did the patient receive the appropriate recommended treatments for chronic conditions, acute protocols and preventive services? If every encounter with a patient is an opportunity to identify a needed service, then providing all participants in a patient's care with comprehensive information about that patient should increase the availability of those needed services. Examples of metrics include mammography rates, HgA1C rates for diabetics, childhood immunization rates, and beta-blocker administration following heart attack.
2. Utilization measures that may be impacted by increased knowledge of previous treatment—e.g., are there services that would have been provided for the patient that now are not done because comprehensive historical information about the patient has been provided to the point of care? Potential metrics include one-day admission rates from the emergency department, multiple MRI rates for the same patient within 30 days, and length of episodes of care for acute conditions.
3. Cost measures that could indicate improvements in efficiency—e.g., did the total cost of treating a patient's episode of care decrease because of increased information? A key requirement to measurement of cost will obviously be the availability of cost data. While charge data are available from various state-level sources for facility-based care, professional and ancillary costs will require data sharing from the payer community.

Maryland is fortunate to be home to some of the nation's leading health science researchers, some of whom are already supporting the CRISP RFA response. With continued federal and local support, our state can absolutely excel in this important area of inquiry. Ultimately, the HIE needs to promote care management, care coordination, and patient engagement, which will result in improved health outcomes and lower costs. If we are to be leaders in the nation for HIE, which the Governor has recently articulated as a goal for Maryland, we will need to demonstrate the value and impact of our efforts.

Benefit Realization

Many IT-related projects often define their primary objective as implementing a new technology solution. As we discuss throughout this document, we believe that while the HIE effort includes a significant technology component, managing the changes within the various stakeholder's organizations is perhaps the greatest challenge we will face. Setting measurable and realistic goals is necessary to have any understanding of our progress. While many of those goals will be measured against a detailed project plan, others will be based on actual usage of the exchange. For example, comparisons of hospital visit volume to hospital exchange queries can establish benchmarks of system utilization. Some of these metrics will also be used to identify reluctant users of the exchange and identify areas where additional training may be necessary.

As with any long-term implementation project, stakeholder communication is an essential piece of project success. While there is likely to be significant interest and excitement at the outset of the project, participants can lose interest during the implementation phase. This can be partly mitigated through frequent and open communication. CRISP will publish a regular newsletter noting accomplishments and upcoming goals, as well as have frequent updates available on our website.

One of the main keys to the successful rollout of HIE services to as broad and diverse a set of stakeholders as exist in Maryland, will be the development of detailed and consumable implementation and user guides for participants. While it is unrealistic to think that we could meet with every physician, hospital, nursing home and other provider in the state to introduce them to the HIE, a great deal can be accomplished through innovative and comprehensive training materials. In addition to user guides that would include a step-by-step "how-to" for accessing exchange services, CRISP will explore the use of on-demand computer-based training programs for self-guided training efforts.

Any goals and measurements will also require a quantitative and qualitative analysis of stakeholder perceived value. CRISP has defined a stakeholder communication plan that defines three groups of stakeholders; physicians (directed towards practices), hospitals, and patients/consumers. This plan includes significant outreach efforts and is inclusive of systems of support. These support systems will be further defined and enhanced as CRISP matures. They will be broad based to cover not only technology support, but also policy support, training and re-training support, and also consumer support in understanding the benefits of the HIE. The support system will also allow CRISP to evaluate perceived value and identify dissatisfied stakeholders. Not all potential providers and consumers will choose to become active participants in the exchange, however CRISP will seek to ensure that those who demonstrate resistance to the HIE are afforded the opportunity to submit their concerns for review by CRISP staff.

Organizational Infrastructure

Ownership Model

CRISP was incorporated as a non-stock corporation under the laws of the State of Maryland on June 3rd of 2008, and amended its articles in October of that year to change its name to the “Chesapeake Regional Information System for our Patients, Inc.” According to its current Articles of Incorporation:

“The Corporation is organized and will be operated exclusively for charitable and educational purposes, specifically to promote health through (i) the development, operation and ownership of a regional system to permit and facilitate the electronic exchange of patient and related health information, and (ii) the making of grants for such purposes to organizations described in Section 501(c)(3) of the Internal Revenue Code.”

The Articles prohibit any activity inconsistent with section 501(c)(3) of the tax code, since it was at the time of incorporation, and remains today, the intention of the corporation to attain tax-exempt status as soon as practicable. As a Maryland non-stock corporation, CRISP does not have owners, i.e. shareholders. As such, none of the members of the corporation hold any equity or rights to receive income or distributions of CRISP revenue. The members have rights to designate members of the CRISP board of directors, who have overall management and governance responsibilities.

This non-stock structure is a necessary prerequisite to obtaining tax exempt status. As discussed elsewhere in this response, CRISP intends to seek tax exempt status as a 501(c)(3) organization, although there are other categories of tax exemption available. The Internal Revenue Service has recently granted 501(c)(3) exemptions to several Health Information Exchanges, after holding the applications in abeyance for several years. The IRS has stated that each application will be considered on a case-by-case basis – i.e. there are no general policies or established principles that CRISP (or any other HIE seeking tax-exempt status under 501(c)(3)) can rely on. It is important that CRISP retain the right to amend its organizational, governance and operational structure to comply with the requirements that the IRS may impose on it as a condition of tax-exempt status.

The organization’s current bylaws, adopted in April of 2009, provide for five “members” who collectively appoint nine Directors to the CRISP Board of Directors, as follows:

Organization	Number of Directors
Erickson Retirement Communities, LLC	1
Johns Hopkins Health System Corporation	2
MedStar Health, Inc.	2
University of Maryland Medical System, Inc.	2
Erickson Health Information Exchange	2

The first four members are healthcare providers, each operating multiple facilities in the state of Maryland. The fifth member, the “Erickson Health Information Exchange”, is a subsidiary of the Erickson Foundation, an operating foundation active in health and wellness matters, which made a \$250,000 contribution to capitalize CRISP.

CRISP currently has no debt or obligations, and any operating surplus would not inure to any third party, including the CRISP members, as provided in the CRISP Articles of Incorporation. The CRISP bylaws provide for officers to operate the company, for the Board of Directors to provide oversight consistent with sound governance, and for the addition of new members as may be deemed appropriate.

The structure of CRISP in place today mirrors the working relationship which has existed between the current members for nearly three years, and it has served both the members and the broader community well. Highlights of our work together include:

- The members have a proven ability to work cooperatively, having conducted a planning project and piloted HIE services together.
- The members have each contributed significant time and talent to the Board and other CRISP efforts as in-kind contributions.
- The CRISP Directors include representatives of the three largest private healthcare providers in the state of Maryland, who have a significant diversity of interests.

Oversight by the Policy Board and the Commissions

CRISP considers the formation of an MHCC-convened Exchange Policy Board to be the best structure to engage the public and ensure effective service to the community by the HIE. The decisions of the Policy Board, when adopted by the MHCC, will be enacted and augmented by the governance structure of the HIE, which is described in the subsequent section. Bi-directional communication between the Policy Board and the rest of the governance structure will be important and will help ensure no disconnect between policy creation and that which is technically feasible or practical. Cross-membership between the Exchange Board of Advisors and the Policy Board, as described in the RFA, is an appropriate mechanism to facilitate that communication. In practice, the engagement of MHCC staff in both venues to provide support will be a second important mechanism to maintain symbiotic effectiveness.

CRISP worked with the MHCC during the HIE planning project, and we have coordinated several other efforts together, including a survey of EHR usage in Maryland. The expertise of the MHCC team has consistently been additive to our efforts, and we expect to continue that relationship as the HIE is built, new services are designated, and federal funding opportunities are pursued.

Governance

CRISP proposes to operate the Maryland statewide exchange under the oversight of an Exchange Board of Advisors. The Board of Advisors will be broad based, as suggested in the RFA, ensuring that a breadth of interested organizations can make certain that the interests and perspectives of their respective constituencies are heard with respect to the HIE services. The mission statement adopted by the CRISP Board of Directors affirms that CRISP will “serve the entire Maryland healthcare community”. The Exchange Board of Advisors will help the CRISP Board of Directors and CRISP officers ensure that this mission is fulfilled. Effective service to all will require broad representation on the Exchange Board of Advisors.

CRISP proposes to implement the governance approach outlined in the RFA, with several modifications and additions. The CRISP bylaws will be amended to implement the structures described below.

Composition

The RFA suggests at least 21 positions on the Exchange Board of Advisors. CRISP believes this breadth of representation is appropriate, and we embrace the list of 21 stakeholders identified in the RFA. CRISP suggests that one member of the Maryland House of Delegates and one member of the Maryland State Senate be added to the Exchange Board of Advisors, as the addition will provide the legislature (which has mandated establishment of an HIE) better visibility into the workings of the exchange.

Committees

CRISP recommends that the Exchange Board of Advisors organize as three standing committees. Each committee will have a chair, and most of the work done by the Exchange Board of Advisors will be accomplished at the committee level. Certain members of the Exchange Board of Advisors, such as the representative of the MHCC convened Policy Board, will sit on multiple committees, but most individuals will sit on just one. A single committee will be comprised of either 9 or 11 people, which CRISP believes is a manageable size for a group intending to get things accomplished, basing our judgment on our experience conducting the HIE planning project. As a result, the Exchange Board of Advisors could encompass more individuals in the aggregate than the 21 positions identified in the RFA, depending on how many people sit on multiple committees. Any individuals beyond those positions listed in the RFA would be selected on the basis of deep subject matter expertise. The committees we envision include:

1. Exchange Technology
2. Clinical Excellence and Use Cases
3. Finance and Community

This committee approach is similar to that taken during the HIE planning project, and we found it to be very effective. We expect that, especially in the startup phase, the committees could be quite busy. For instance, the Exchange Technology committee will likely need to work hard during the initial period of technology procurement, and we will want significant expertise on that team, to assess vendors and proposals and to make recommendations to the CRISP Board of Directors as to final vendor selection.

CRISP suggests that a member of the MHCC staff participate as an ex officio member of each committee. If the ex officio participant of the Policy Board is also a member of the MHCC staff, this suggestion will have been met already. At the discretion of the committee chair, additional members of the MHCC staff may also participate in the work of the committee.

Term of Service

CRISP agrees with the four-year term for the Exchange Board of Advisors, with some additional provisions. The length of the commitment may inhibit our ability to attract the sharpest people to serve, as some busy leaders will hesitate to make such a long commitment. The four-year term could also lead to the awkward situation of an Exchange Board of Advisors member who has substantially stopped participating having to be maintained on the rolls for several more years. We found during the HIE planning project that many of the individuals who joined the workgroup were interested in the work and became increasingly engaged throughout the course of the year. Yet, some who had committed gradually participated less. The four-year term could also inhibit participation by stakeholders who are interested in being involved, but might be shut out because all the Exchange Board of Advisors slots are filled between now and 2013. CRISP recommends annual renewal votes, which encourage the ongoing participation of those leaders who are engaged and adding value but will allow us to trim from the roles and replace those who are no longer substantively participating.

Nomination

CRISP believes that an effective nomination process will help ensure that the Exchange Board of Advisors continues to be stocked with excellent talent and subject matter expertise. As such, for the initial establishment of the Exchange Board of Advisors, and when openings subsequently arise, CRISP will solicit nominations from the following organizations:

- The Governor of Maryland
- Office of the Attorney General
- MHCC
- DHMH
- Maryland Hospital Association

- CRISP Members
- MedChi
- HIMSS of Maryland
- The Maryland Chamber of Commerce
- LifeSpan
- Others professional associations, as deemed appropriate to cover the list of stakeholders specified in the RFA

The CRISP Board of Directors will act on these nominations, with an eye towards maintaining geographic, institutional, and other diversity on the Exchange Board of Advisors, and will endeavor for the membership of the Exchange Board of Advisors to be reflective of the entire community of Marylanders. In some cases, the CRISP Board of Directors may solicit more than one nomination for a single position, in order to more effectively accomplish these important goals.

CRISP suggests that service on the Exchange Board of Advisors from the first through the fourth year of a single term should not require re-nomination during the term. Rather, the CRISP Board of Directors will vote annually on continuing the appointment. The CRISP Board of Directors will not continue the appointment of any individual to the Exchange Board of Advisors who expresses a desire not to continue service or who has become substantially disengaged from the work of the group.

At the end of the fourth year of service on the Exchange Board of Advisors, individuals will not be eligible for an annual reappointment vote. However, an individual could be reappointed after being nominated again, at which time the four year clock would restart.

Fiduciary Responsibility

Maryland law imposes duties on members of the Board of Directors of not-for-profit, non-stock corporations. Such an organization is required to maintain a Board of Directors which, among other things, owes a Duty of Care and a Duty of Loyalty to the corporation. The Directors have a fiduciary responsibility to seek the best interest of the corporation and not that of themselves or of another organization, and they risk some individual liability for violating these obligations. This is consistent with the position of the Internal Revenue Service, which, among other things, expects directors of an organization seeking 501(c)(3) tax-exempt status to “act solely in the interests of the charity.” The CRISP Board of Directors serves this legal function for CRISP and plans to continue doing so. In addition, the Internal Revenue Service has expressed concern about applicants for 501(c)(3) tax-exempt status that have a very large governing board because of the possibility that a large board will not be sufficiently attentive to its oversight duties. The IRS has suggested, among other things, that advisory bodies be utilized to avoid the risks of an unduly large board of directors.

Key Activities

An Exchange Board of Advisors is envisioned as a forum in which individual advisory board members can advocate that the HIE serve the interests of various Maryland constituencies. As members of an advisory board, these representatives will owe no fiduciary duty to the Exchange and will thus be free to advocate that the Exchange serve the needs of their own organization. CRISP will welcome the input of this Board of Advisors and recognizes the importance of their advocacy to the success of the exchange.

It is our hope, however, that in carrying out their work, individuals appointed to the Exchange Board of Advisors will recognize the need to seek common purpose in the operation of the HIE. Advisory responsibilities which will be defined for the Exchange Board of Advisors include:

- Provide strategic guidance on the adoption of evolving technology standards
- Make recommendations for procurement and management of technology solutions, through RFP response scoring and performance evaluation
- Evaluate the development of implementation project plans and methodologies
- Recommend prioritization for clinical Use Case deployment
- Provide input for the evaluation of clinical effectiveness of HIE services

- Build community trust through effective implementation of policies established by the Policy Board
- Expand provider awareness and participation in the HIE
- Aid in the development of patient education and outreach materials
- Help balance the interests of the many stakeholders in the state
- Evaluate business plans, and particularly the impact of service fees
- Assist in the pursuit of funding to further the aims of the HIE
- Ensure that the plans for specific Use Cases will preserve the financial health of the HIE
- Promote transparency in the operation of the HIE, ensuring that the general public has ready access to the operational policies and information about the HIE

The governance structure and responsibilities described here are consistent with those in use by other HIE efforts, as for instance, the Wisconsin Health Information Exchange, which maintains a small governing board and a larger advisory board. The Board of Advisors is deemed by CRISP to be a critical element of the HIE governance model.

CRISP Board of Directors Composition

CRISP considers the above described structure of a small and focused governing board, paired with a larger and more inclusive advisory board, to be important to the strategic and operational effectiveness of the exchange. It is essential that the governing board continues to function efficiently, following best practices for non-profit governance. However, the CRISP bylaws do provide a mechanism for the addition of “member” organizations to CRISP, and with agreement of the members, the Board of Directors composition can be changed. The CRISP members have indicated a willingness to modify the membership and governing board structure, should it prove helpful in advancing the mission of the organization, while remaining consistent with governance best practices and legal considerations, including those for tax-exempt organizations.

Summary

CRISP will expand its existing bylaws to define the rights and responsibilities of the Exchange Board of Advisors, enumerate the process for nomination and approval, and specify the establishment of each Committee. The work of the MHCC convened Exchange Policy Board will also serve the HIE, and its decisions, when adopted by the MHCC, will be enacted and augmented through the above governance structure. Adjustments to the composition of CRISP’s governing board will be considered, if they help advance the mission of the organization.

Operational Structure

Staff and Operational Duties

Heretofore, CRISP has been effective in its work by relying on a combination of staff made available as contributions from the current members, consulting agreements with Maryland-based companies, and participation of stakeholder employees in specific projects. The implementation and operations phases of the HIE will require changes to that approach. Yet, we believe the most efficient use of state funds will avoid establishment of a high-overhead infrastructure, and we will continue to rely on the participation of stakeholders to complete our work.

During the first two years of HIE build out, CRISP anticipates hiring only several regular employees. Systems integrators and management agreements will provide the bulk of CRISP’s capacity in this startup phase. In years three and beyond CRISP expects to transition towards regular employees to support the ongoing operations of the exchange. This strategy will allow CRISP to engage higher-caliber talent during the critical implementation period, without incurring the long-term expense of those resources when we reach sustainability.

President

The daily operation of CRISP, and thus of the Exchange, will be managed by the President of CRISP. This individual [the resume of CRISP’s current President is in the appendix] reports to the Board of Directors, and is an ex-officio Director. According to CRISP’s bylaws:

"The President shall have the necessary authority and responsibility to operate the Corporation in all its activities ... The President is charged with continuous responsibility for the management of the Corporation, commensurate with the authority conferred on him or her by the Board of Directors and consistent with the expressed aims and policies of the Board of Directors."

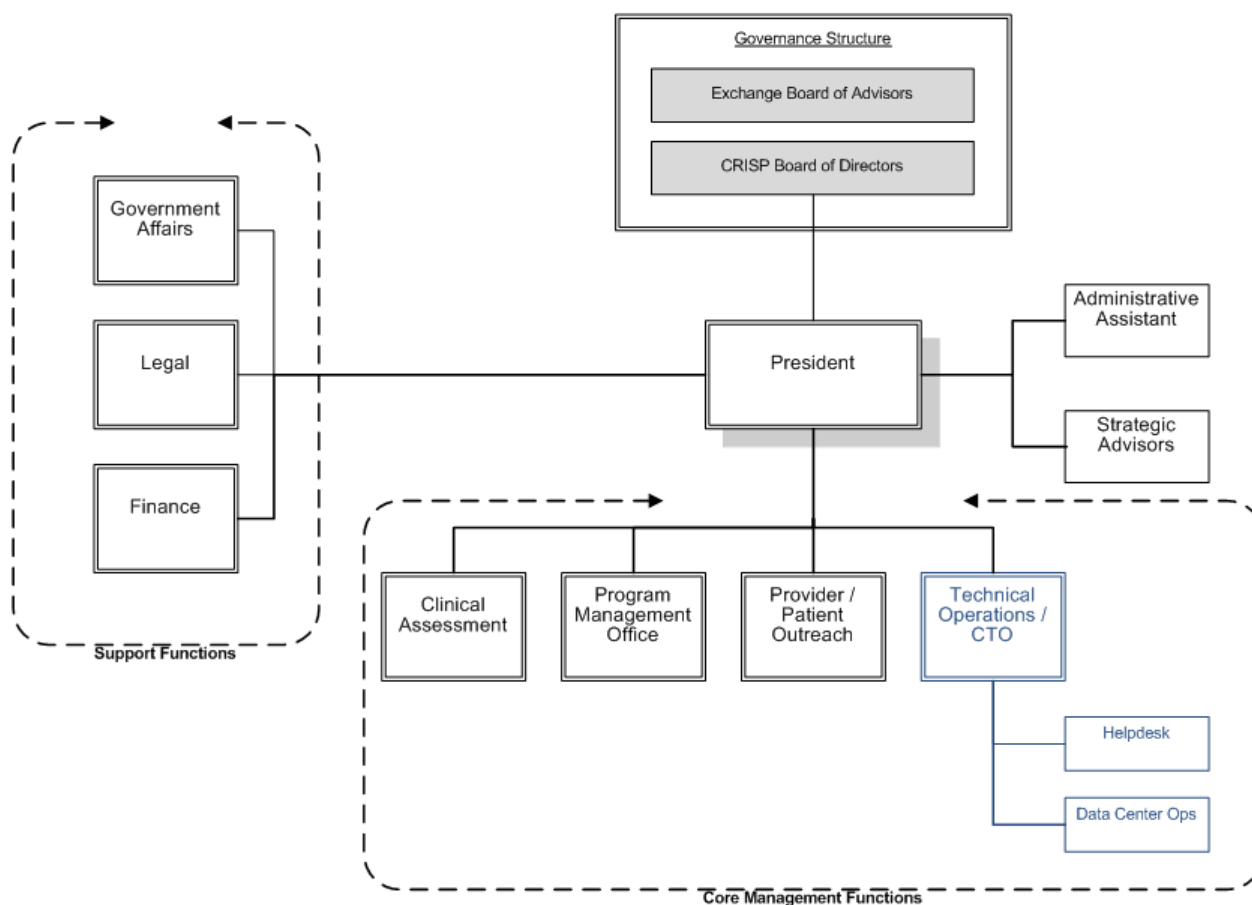
The bylaws provide for the President to be retained as an employee of CRISP, or for the services of a President to be contracted from a qualified firm. Currently, the services of the CRISP President are being provided as a contribution from Erickson Retirement Communities. However, the Board of Directors has moved to retain the President as a regular fulltime CRISP employee after, and assuming, the HIE grant award is made to CRISP.

A job description and qualifications for the CRISP President are contained in the appendix.

Management Functions

CRISP proposes to staff the following functions in support of the HIE implementation.

CRISP Organization Structure



To minimize cost, some of these functions will be part-time to CRISP. To maximize flexibility, some of these functions will be accomplished through partnerships with consulting organizations.

Clinical Assessment

The HIE will be more effective in its service to providers if an individual with clinical experience is part of the team. This part-time role will be particularly focused on the impact our solutions may have on clinical workflows. While the providers will ultimately be responsible for maintaining their own sound clinical workflows, a clinical expert affiliated

with CRISP will be able to more effectively dialogue with providers on these issues, and help providers learn from the experiences of one another. This position will ideally be a part-time nurse, with experience in workflow design. The function could possibly be arranged through an agreement with a clinical partner.

Program Management Office

The PMO is the team that will implement HIE technology and roll out Use Cases to Maryland providers. The effectiveness and productivity of this department will largely define the success of the HIE in changing “facts on the ground.” The PMO will conduct the initial technology procurement under the guidance of the Exchange Technology Governance Committee, test and deploy the technology in support of initial Use Cases, plan and implement Use Cases at pilot locations, and transition support of the Use Cases to a permanent support structure. In the first several years, the PMO will likely represent the bulk of the labor costs for the HIE. Because the size of the team will need to expand and contract depending on the nature and volume of work at any given time and because already-developed project management capabilities will be essential to a quick start, CRISP intends to contract with consulting firms with a Maryland presence, and who have a proven track record of successful project management in the HIE/health IT space. CRISP’s partnerships with consulting firms during the HIE planning project and medication history pilot have proven cost effective and successful, making this strategy a logical continuation of a past practice. CRISP has found success drawing resources from more than one firm, and we do not plan to ‘turn over’ the project to a single consulting partner.

After the HIE grant award, CRISP will again contract with systems integrators, seeking the most qualified/cost effective team available. The most important position within the PMO, and one that will persist through various phases of implementation, is the PMO Director. A job description for the PMO Director is contained in the Appendix, along with estimated costs for PMO team members. Our past experience engaging partners for HIE projects makes us confident in our ability to deploy a highly capable team.

Provider/Patient Outreach

This function will be somewhat analogous to marketing and sales in a for-profit business, but it will also include the need to effectively incorporate the feedback from the many stakeholders who are participating in the HIE efforts in Maryland. CRISP intends to staff this position with a full-time employee, although it could also be filled through a management agreement to provide a qualified individual. This team member will ‘keep score’ on satisfaction with our services and will partner with organizations such as the MHA, to reach out to the state’s providers and engage them with the HIE. This function will also be augmented by assistance from a consulting partner, for help in media relations and the development of marketing materials.

The longer term vision for this function includes regional outreach coordinators. The speed of market adoption and the nature of each Use Case will dictate the need for CRISP to invest in this function. Ideally, the Director of Outreach will be able to partner with the Marketing arms of stakeholder organizations to drive adoption – e.g. the national lab providers already have a relationship with physician practices, and the Maryland Hospital Association has strong lines of communication to the state’s hospitals. A job description for the Director of Outreach is in the Appendix, accompanied by qualifications for a consulting partner to provide assistance.

Technical Operations/CTO

The Use Cases implemented by the PMO will subsequently transition to a permanent support team, which will be the Technical Operations department. the nature of this function cannot be accurately designed until after the specific technology solution is procured. Some solutions could be largely managed by the vendor, and run from datacenters under their control. Other solutions could be licensed and installed locally, which would require more extensive data center capability at CRISP. Should data center operations become an important part of the CRISP business, this function will be managed by a Vice President of Technology (or possibly a Chief Technology Officer – CTO), who will be tasked both with running the technical services and understanding developments in the field. Systems analysts would be hired to staff the data center operations function, reporting to the VP of Technology. The VP of Technology and Systems Analysts are envisioned as regular employees. Helpdesk services are likely to be contracted to a firm experienced in helpdesk operations, and which is enabled by scale to provide a service level beyond that which could be efficiently built internal to CRISP.

These positions are not anticipated to be filled in the early years of HIE deployment, during which time the PMO will maintain the newly installed systems. For this reason, Technical Operations is shown in blue in the above org chart. Furthermore, the timing and scope of this function will, as stated, be adjusted subject to the nature of the technology procured. A preliminary job description for the VP of Technology is in the Appendix.

Support Functions

Government Affairs

Maintaining open communication with elected officials and government entities will be important to the success of the HIE, and the government affairs function will work to make that happen. Pursuit of federal funding will also be important in the early phase of the HIE and will also fall under this function. Furthermore, a government affairs person will aid in stakeholder outreach. To date CRISP has contracted a part-time government affairs consultant, and the arrangement has proven effective in reaching out to stakeholder organizations, as evidenced by the many letters of support attached to this application. CRISP has also relied on the assistance of the government affairs teams of its members. CRISP expects to continue engaging the part-time services of an experienced government affairs specialist, or could also enter into a management agreement with another healthcare organization to receive these services. Brief qualifications for the government affairs consultant are provided in the appendix.

Legal

Past CRISP efforts have benefited from expert legal counsel, with the participation of attorneys who specialize in health IT matters and who have been recognized as leaders in their field. Legal counsel has assisted in the development of participation agreements for CRISP projects, and legal counsel played a significant role in the Privacy & Community Interaction workgroup of the HIE planning project. Expert legal counsel has also provided substantial pro-bono services to the CRISP Board of Directors. CRISP intends to continue using the part-time services of a reputable law firm, rather than hiring in-house counsel. In addition, the Chair of the CRISP Board of Directors and the Secretary of the CRISP Board of Directors both bring a healthcare oriented legal background to the leadership team.

Finance

CRISP will need to maintain financial accounts, pay bills, process accounts receivable, and conduct the normal accounting work of a small business. To date, CRISP has received accounting services from one of its members, provided as a contribution. While the volume of accounting work for the HIE will likely outgrow this current arrangement, it is not expected to require a full time finance professional, at least in the early going. The Treasurer of the CRISP Board of Directors will help arrange a service agreement with a part-time bookkeeper, or CRISP will contract for accounting services from a larger organization. More strategic financial planning and analysis work will be the responsibility of the President and Treasurer. As the volume of financial transactions grows in subsequent years, CRISP will contract for accounting services in a way that maintains competitive costs on a per transaction basis. The resume of CRISP's Treasurer is in the appendix.

Administrative Assistant

CRISP will employ the services of an Administrative Assistant, to help manage the administrative operations of the office, and especially to coordinate the meetings of the Exchange Board of Advisors. Some administrative help, such as a receptionist, could be included in a facility lease. However, an experienced Administrative Assistant will be important to the effectiveness of CRISP's daily operations. To date, CRISP has relied on part-time administrative help, provided as a contribution by a CRISP member. This assistance proved important during the HIE planning project.

Strategic Advisors

CRISP will seek to engage strategic advisors of varying experience, either on an hourly or retainer basis. For instance, an individual who has implemented a Use Case in another state could provide valuable counsel to CRISP during a one day visit. The total volume of such work is expected to be limited, and the engagement of advisors may be opportunistic. CRISP has contracted a limited number of strategic advisors in the past, such as the President of another state HIE. Several individuals with a background in national HIE planning have also provided counsel and review on a pro bono basis.

Project Management

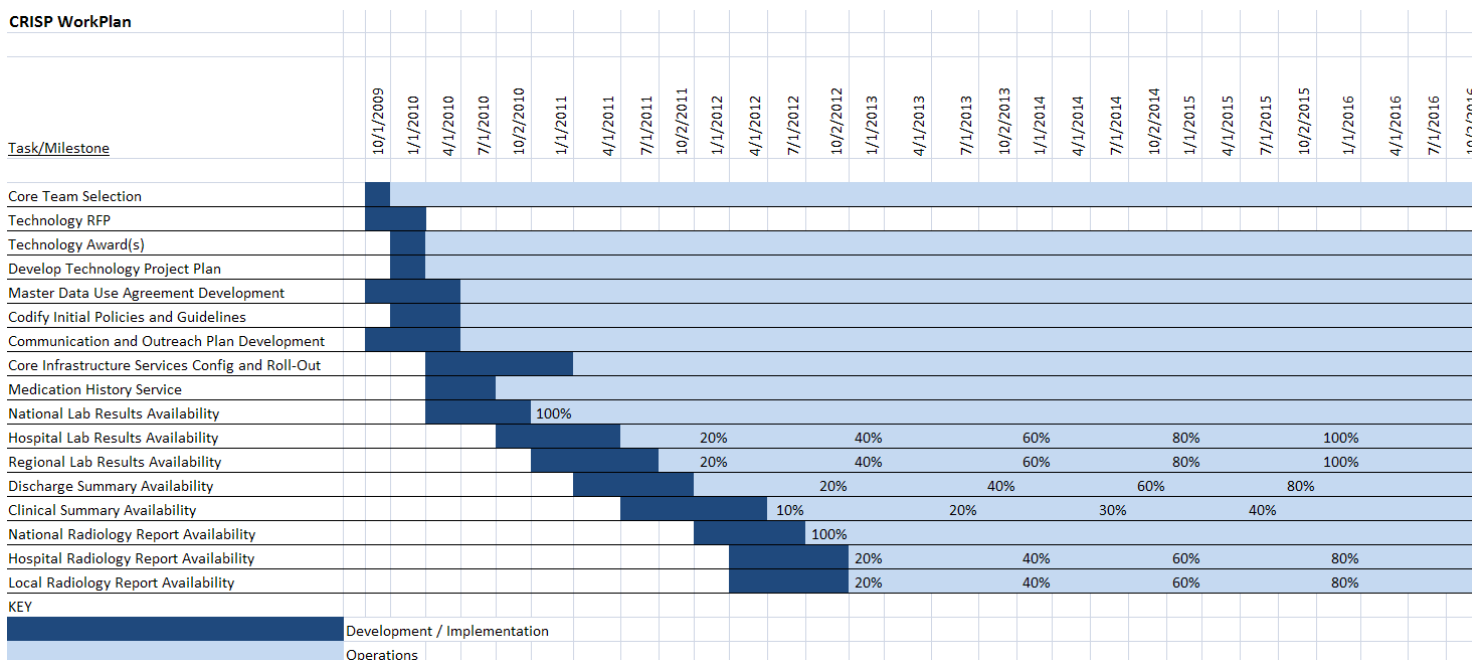
Team Selection

The team selection process will include numerous avenues to ensure qualified candidates are brought into the project team. The project management team and staffing plan is described in detail above and the organizational chart depicting the structure of that team is presented in the Operational Structure section. Job descriptions and qualifications are provided in the appendix. CRISP, through both our membership and our past projects, has worked with, now employs, and has relationships with resources and systems integrators capable of filling the roles defined above. Indeed, more than a few firms and individuals have approached CRISP for consideration in the HIE work to follow the award of this grant. While CRISP has determined that the implementation will be best served if we select a team after the award and closer to the period in which work will actually begin, the resumes and qualification of the individuals already vying to be included are quite impressive. Selection of team members and consulting partners will be done in conformance with HR best practices, seeking to optimize talent and qualification at a cost effective price.

The CRISP Board of Directors will be engaged in talent acquisition, ensuring transparency and fairness. Through its Directors CRISP has enormous experience in talent acquisition for health IT efforts, both of employees and integration partners. Bio information of the CRISP Directors is in the appendix.

Work Plan

The work plan below outlines the specific major milestones in implementing the HIE. These major milestones represent the key activities to making data for each Use Case available. The work plan timelines are broken into quarterly increments spanning seven years. The development and implementation lines represent the timeframes for completing specific activities, such as the core team selection and completing the technology RFP process. The work plan highlights Use Case “availability” as the key milestone, meaning that the percentages shown in the “operations” bar represent data sources (e.g. nation labs or RxHub / SureScripts) that have been integrated with the exchange and that are available to providers.



The national lab and national radiology data sources are noted as 100% immediately after the implementation phase due to the fact that there are only two sources for each data type at the national level. While this work plan focuses on data source availability, other areas of this document outline participant adoption rates of the various services enable according to the timeline above.

As technology is procured and specific system implementation approach will be developed. At the point the system implementation approach is determined, detailed project plans will be developed (referenced above in the work plan) that outline specific line items to accomplish each Use Case. A medication history Use Case project plan is included below.

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	Medication History Pilot Project	169 days?	Mon 10/1/07	Thu 5/22/08		
2	CIO Conceptual Agreement	46 days?	Mon 10/8/07	Mon 12/10/07		
3	Medication History Presentation to CIOs	1 day	Mon 10/8/07	Mon 10/8/07		
4	CIO question and answer period	21 days	Tue 10/9/07	Tue 11/6/07	3	
5	CIO / CEO letter of support	1 day?	Mon 12/10/07	Mon 12/10/07		
6	Identify Initial ED Locations	36 days	Fri 12/14/07	Fri 2/1/08		
7	Identify Number of ED sites	1 day	Fri 12/14/07	Fri 12/14/07		
8	Identify current tech infrastructure at ED sites	5 days	Mon 1/28/08	Fri 2/1/08		
9	PBM Analysis	110 days?	Mon 10/1/07	Fri 2/29/08		
10	Validate w/ pilot results	2 days	Mon 2/11/08	Tue 2/12/08		
11	Obtain Payer mix	1 day	Mon 10/1/07	Mon 10/1/07		
12	Get commitment from 75% of payers	1 day?	Tue 10/2/07	Tue 10/2/07	11	
13	PBM Connectivity	30 days?	Mon 1/21/08	Fri 2/29/08		
14	Prescription Solutions Contract with RxHub	30 days?	Mon 1/21/08	Fri 2/29/08		
15	Legal Analysis	88 days?	Mon 10/1/07	Wed 1/30/08		
16	Review of Federal Law	15 days?	Mon 10/1/07	Fri 10/19/07		
17	Review of MD State Law	15 days	Mon 10/22/07	Fri 11/9/07		
18	Memo interpreting Fed and State Law available to workgroup	1 day	Wed 1/30/08	Wed 1/30/08	16,17	
19	Erickson Foundation / LLC Transition	22 days?	Mon 1/14/08	Tue 2/12/08		
20	Identify pilot funding amount	5 days?	Mon 1/14/08	Fri 1/18/08		
21	Determine length of ERC txn funding	5 days?	Mon 1/28/08	Fri 2/1/08		
22	Establish Foundation LLC	12 days?	Mon 1/28/08	Tue 2/12/08		
23	Transfer funds	1 day?	Mon 2/11/08	Mon 2/11/08		
24	Contracting	62 days?	Mon 12/3/07	Tue 2/26/08		
25	Contract	60 days?	Mon 12/3/07	Fri 2/22/08		
26	Terms+Conditions	45 days	Mon 12/3/07	Fri 2/1/08		
27	Scope of Work	7 days	Mon 2/4/08	Tue 2/12/08		
28	Erickson Review	7 days	Wed 2/13/08	Thu 2/21/08	26,27	
29	Contract Executed	1 day?	Fri 2/22/08	Fri 2/22/08	28	
30	Contracts with Participating Hospitals	50 days?	Wed 12/19/07	Tue 2/26/08		
31	Obtain VT example	5 days?	Wed 12/19/07	Tue 12/25/07		
32	Transaction Price Negotiations	10 days	Mon 2/4/08	Fri 2/15/08		
33	Contract development	21 days?	Mon 1/28/08	Mon 2/25/08		
34	Contract Execution	1 day?	Tue 2/26/08	Tue 2/26/08	32,33	
35	Project team development	15 days?	Wed 2/27/08	Tue 3/18/08		
36	Assign team (sites, vendor, consultants)	15 days?	Wed 2/27/08	Tue 3/18/08		
37	Determine hospital resource availability	1 day?	Wed 2/27/08	Wed 2/27/08	34	
38	Technical	14 days?	Thu 2/28/08	Tue 3/18/08	37	
39	Privacy/Legal	14 days?	Wed 2/27/08	Mon 3/17/08	34	

Performance Management

The success of the HIE effort hinges partly on the performance and execution of the project team. By aligning incremental HIE successes with the interests of the team CRISP will be able to ensure performance remains at appropriately high levels. A natural alignment of interests exists in that those resources with roles on the project team will seek to keep those roles, and contracted resources will seek to continue to be engaged by CRISP. However, CRISP can align interest even more tightly through performance-based compensation where appropriate. By setting measurable goals with project resources, documenting those goals, then revisiting them at defined intervals, project management will have the ability to rate performance and compensate resources based on that performance.

During past CRISP projects, contracted resources have typically had between 10% and 30% of compensation at risk and dependent upon accomplishment of measurable goals. CRISP has found this approach to be effective when targets can be clearly defined and measured. Monthly face-to-face “check-ins” with integration partners have been used to update a scoring matrix, which is contained in the Statement of Work, and in which goal targets and weights are defined. These check-ins set expectations for performance grading and are an opportunity to discuss remediation of problems. CRISP has found this system to be highly effective and motivational, (if not always 100% pleasant to administer or receive). Monitoring and assessment of employee and consulting organization performance will be the responsibility of the President of CRISP.

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Health Information Exchange Policy

The Legal and Regulatory Landscape

Health Insurance Portability and Accountability Act

CRISP has reviewed the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and used it as a guide for the design of the health information exchange described in this response. It is clear that HIPAA does not require any patient consent or authorization for the exchange of individual patients' health information among healthcare providers for treatment purposes. A patient's consent to such exchanges is viewed as implicit in the patient's consent to receive medical care. Certain other exchanges are also permitted without either consent or authorization under both HIPAA and the Maryland Confidentiality of Medical Records Act (CMRA), generally for payment purposes, and additionally for certain healthcare operations constituting quality assurance, review of provider qualifications, and fraud and abuse monitoring or response. In addition, HIPAA permits disclosures to government agencies for a number of lawful purposes, including public health surveillance without patient consent or authorization. As further Use Cases are adopted, certain other disclosures may require patient specific authorization (which the patient can withhold) in a form that meets the requirements of HIPAA.

In December of 2008, the Office of Civil Rights of the Department of Health and Human Services, the HIPAA civil enforcement arm of HHS, issued a series of related papers on the HIPAA Privacy Rule and health information technology (the "Guidance").³ The Guidance constitutes an overview of HHS' positions on the application of the HIPAA Privacy Rule to electronic health information exchanges. In general the Guidance is consistent with, and supportive of, the type of health information exchange CRISP will implement. The Guidance deals with a model of health information exchange that is, in operational terms, the same as the hybrid model CRISP proposes to implement in Maryland—treatment purpose focused and with the HIE as a conduit for the exchange of information among participants, not as a central repository of participant information. While recognizing that patients' consent to the exchange of their information among healthcare providers for treatment purposes is implied in the general consent to be treated and does not require specific affirmation by the patient, the Guidance favors allowing individuals the opportunity to opt-in or to opt-out of having their information flow through the HIE. The Guidance refers in this regard to the option providers are given in the HIPAA Privacy Rule to seek patient consent for uses and disclosures, even in the absence of a requirement that providers do so. CRISP will comply with this preference by allowing patients to universally opt-out of the exchange and also requiring some consent on a per encounter basis, depending on the specific Use Case. In addition, the Guidance affirms that an HIE, as a business associate, can maintain a master patient index (MPI) and a registry for patients of participating providers, in advance of any actual treatment communications for those patients. CRISP will maintain both an MPI and a patient registry.

Maryland Confidentiality of Medical Records Act

The Maryland Confidentiality of Medical Records Act is substantively consistent with HIPAA with regards to implicit consent and the other points in HIPAA discussed in the preceding section. Under the Act, an individual's health information may be exchanged among healthcare providers with only implicit consent for treatment purposes. In addition, the Maryland Attorney General, in 2007, issued an opinion related to the Maryland Confidentiality Medical Records Act which addressed the requirement of a patient opt-in versus opt-out policy in an electronic health records system. According to the opinion, "a patient does not have a right under the Act to 'opt-out' of an HIE that functions to exchange information among provider for treatment purposes—to receive services from a healthcare provider while insisting that the medical records related to that service be excluded from the HIE." The Attorney General concluded that "the disclosure of medical record information solely for purposes of clinical care and payment and to the technical personnel needed to keep the system operational, as discussed above, is permitted 'without the authorization of the patient.'" The phrase "without the authorization" is not compatible with a patient's exercise of a veto over otherwise

³ The HIPAA Privacy Rule and Health Information Technology (HIT), posted on the website of the Office of Civil Rights on December 15, 2008.

permissible disclosures. Opting-out is simply a denial of authorization. A patient, however, has no right to deny that which is not required at all. Thus, in our view, the Confidentiality of Medical Records Act does not prohibit an HIE from operating on the basis that participating healthcare providers must make all of a patient's medical records available through the HIE. However, because the law does not dictate appropriate policy, an important caveat to the interpreted allowance is that "making patient's medical records" available does not imply those records are stored within the exchange. Demographic and care encounter information used to locate records that are stored outside of the exchange is the only patient information held centrally in our proposed model. We believe this approach will foster the adoption of the exchange by avoiding the negative perceptions of the wholesale transferring or storage of consumer's health information and by reinforcing the sentiment that consumers have rights to the way in which their information is handled and exchanged.

In the opinion, the Attorney General concluded that the CMRA would permit an HIE in which medical records are held by certain providers and referenced in an "index" (MPI) facilitating other providers' access to the records as needed "without the authorization of the patient."⁴ This indexing function is a critical element of the approach CRISP will implement. Demographic and care encounter information used to locate records that are stored outside of the exchange will be the only patient information held centrally in our proposed HIE. We believe this approach will foster the adoption of the exchange by avoiding the negative perceptions of the wholesale transferring or storage of consumer's health information and by reinforcing the sentiment that consumers have rights to the way in which their information is handled and exchanged.

CRISP recognizes that the regulatory environment in which its exchange would operate will be significantly changed as the various HIPAA amendments and new requirements imposed as a part of the HITECH Act sections of the American Recovery and Reinvestment Act of 2009 become effective. CRISP has reviewed those requirements and assessed them on a high level basis and is confident that, directly and through appropriate vendor selection, it will be able to comply. For example, CRISP has always contemplated being a business associate of participants and envisioned security protocols consistent with those required of a covered entity under the HIPAA security rule. The fact that the HITECH Act will require this does not, therefore, require changes to basic operational and technical design decisions that have guided CRISP so far. Other requirements, such as the need to support accounting for disclosures for treatment, payment and health care operations for a rolling three year period, will not be required for several years and CRISP will ensure that selected vendors can support these requirements. So too, reporting of any security breaches to participants has been contemplated by CRISP, pre-HITECH Act, as a necessary obligation to its participants and their patients, whether or not required by law.

Conclusion as to the Medical Information Privacy Regulatory Environment

CRISP views HIPAA and the CMRA, particularly as interpreted in the recent pronouncements discussed above, as consistent with, and in fact supportive of, the type of HIE CRISP proposes to build. Both Acts support the transfer of more data earlier in the life of the exchange, for treatment purposes at least, which could lead to greater adoption of both EHRs and in entity participation in the exchange due to the fact that one measure of the value of the exchange will be the amount of data available. The growth rate will accelerate as more data comes online, and an opt-out policy could foster exchange usage.

Further, provider workflow considerations and management of a patient's right to participate or not to participate are also of considerable concern in creating a consent policy. If patient participation rights were to be managed on a provider-by-provider, encounter-by-encounter basis, providers would bear a significant, and potentially prohibitive, technical and workflow burden establishing processes for obtaining and tracking consent of their patients.

In developing a patient participation rights policy for the exchange, ensuring patient privacy and consumer choice protections without handicapping the exchange by excluding large amounts of health information (because of an opt-in consent/participation policy) is a difficult task. The challenge is to develop a policy that allows for a robust amount

⁴ Maryland Confidential Medical Records Act, Maryland Attorney General's Opinion, 2007.

of patient data early on in the life of the exchange, thereby increasing the value to participating providers, while still affording consumers notice and the ability to exercise their right of exclusion from the exchange. We believe our opt-out approach is the best way for the exchange to achieve this balance.

Participation Agreements and Appropriate Use Policies

CRISP will develop a participation agreement that will codify the relationship between the HIE organization and the various participants. One of the challenges in creating such an agreement is that multiple participants, each of whom may have its own in-house legal counsel, will have to agree on the components and structure of the document. The logic behind arriving at a consistent participation agreement that is entered into by each participant without substantial or material modification is to ensure that “transitive trust” can be maintained across the entire exchange.⁵ Transitive trust is the mutual trust between HIE participants rooted in the knowledge that each participant has entered into a consistent participation agreement that defines appropriate usage and requirements for participation, thereby avoiding the participant-to-participant need to know every individual provider and employee accessing the exchange.

The appropriate use policy is a document that will be referenced by, or included in, the participation agreement defining specific appropriate and inappropriate uses of the health information exchange by individuals who have been granted access. It is assumed that any individual accessing the health information exchange who has not been credentialed to do so is accessing the HIE inappropriately. The participation agreement will also articulate the response of the HIE organizations and consequence of misuse, discussed further below.

The incremental, Use Case-driven implementation approach espoused by CRISP impacts the way contracting would occur. This approach acknowledges that agreeing on the terms and conditions in a participation agreement for a future-state, robust health information exchange (including any potential data types) and gaining community-wide agreement by each participant is a difficult task. However, arriving at such an agreement, even if possible, is not necessarily advisable considering the rapidly evolving health IT landscape. A more pragmatic approach to contracting, especially in an exchange seeking broad stakeholder participation, is to develop a base terms and conditions document to which amendments are added as exchange services expand and new legal issues arise. The CRISP approach ensures that the exchange is able to manage the contractual challenges associated with HIE dynamically and over time.

Provider Liability

Participation in an HIE can raise liability issues for participants. A key area of concern relates to the standard of care in instances of medical malpractice, specifically whether the availability of more information about a patient’s medical history will broaden the provider’s responsibility for reviewing and considering all such information in making care decisions.

At base, and CRISP feels most significantly, an HIE will lead to better outcomes, increased patient safety, and less risk of malpractice by, for example, making a more complete medication history readily available at the point of care, leading to a reduction in harmful adverse drug events. The other consideration is the concern that the availability of more information will alter the standard of care by requiring that a provider familiarize themselves with a patient’s entire available medical record. CRISP believes that this is not the standard of care in a paper-based system or an individual provider electronic health record environment and, therefore, will not change in an HIE; at least not in the initial period of roll-out and adoption throughout the state. While provider liability concerns deserve serious consideration, it will take several years for judicial decisions to provide a guide to what, if any, changes in the standard of care as to review of medical records HIEs will generate. Historically, the standard of care is determined by courts, based on testimony of expert witnesses in contested malpractice cases. National organizations of providers may also establish standards. In addition, there are indications that significant legislation, such as HIPAA, may also form a basis for standard of care

⁵ Markle Foundation, Summary of Policy Recommendations from the Markle Foundation’s Connecting for Health Common Framework, April 2007.

determinations. In all events, however, the standard of care evolves slowly and has not, to date, required that just because an HIE makes more individual patient information available, a provider to review and consider all of it in making clinical decisions. The test is, and should continue to be, what a reasonable provider would do in a similar circumstance. As HIE efforts take hold around the country, Maryland providers will be in a far better position than their colleagues around the country based on their ability to comply with new standards of care through the CRISP HIE.

For this reason, CRISP will allow for information available to be tailored based on provider generated input. For example, in the medication history pilot Use Case, providers said that they were not interested in medication information more than six months old; that it was, under current standard of care, not generally relevant, at least in the emergency room context. The CRISP HIE would be implemented with such input. Such development is particularly congruent with the Use Case approach to the CRISP HIE, since the available information is tailored to specific uses and to the needs of providers. There are other liability issues inherent in an HIE, such as antitrust issues that could arise if the exchange were used to share competitively sensitive information among competitors, and while CRISP takes all potential legal issues inherent in the exchange seriously, we believe that compliance with privacy laws related to the standard of care is the most significant consideration.

Privacy and Security

Access, authentication, audit, and authorization refer to activities within an HIE that describe how participants in the HIE are defined and identified as individual users of the system; how the usage of the system is governed; how users are accurately and appropriately identified; and how records of that usage are captured, stored, and used for various audit purposes. CRISP's approach to HIPAA's "four A's" is described below.

Access

Access to the HIE is defined by a participant's ability to obtain data from another source leveraging the HIE as a conduit to transfer the information in a private and secure manner. An HIE can bridge gaps that currently exist between data silos between individual institutions, but as a function of that capability also expands individual access to more patient health information. A commonly cited concern when considering access to an HIE is that as the clinical value of accessibility to greater amounts of health information increases, there is a similar increase in the risk associated with managing access and ensuring appropriate usage as the population with access to the HIE increases. Defining roles within each participating entity and assigning access constraints and allowances to those roles is a logical and scalable approach to resolving a number of access concerns. An assumption in defining particular roles is the existence of identities. An identity, in the context of a HIE, is an individual or entity that has access to the exchange to perform a particular function or task.⁶ Each identity must be appropriately associated with a role.

CRISP will use role-based access to allow for participating entities to control access levels for the various resources within their organizations. CRISP acknowledges providers who currently utilize health information systems will likely have experience with assigning roles that dictate access level. In considering how role-based identity management is controlled, the HIE must determine what entity defines those roles. Varying levels of identity management complexities exists, dependent upon whether participants access the HIE through local integrated systems or through a specific client or web-based application.

The inclusion of an additional application, usernames and passwords into a participating entity's operations may impose a number of challenges; however, CRISP intends to pursue this approach because it is more realistic for near term clinical data exchange. Because CRISP will offer a physician portal or secure website as a possible avenue to access the exchange, role types will be established and assigned. CRISP will identify and allow HIE administrator privileges to the appropriate user within participating entities who will then have the ability to assign usernames and password

⁶ Markle Foundation, *The Connecting for Health Common Framework: Resources for Implementing Private and Secure Health Information Exchange*, 2005.

to individuals within that entity. Further, if the participating entity has already deployed the infrastructure to support single sign-on capability, then concerns of password fatigue will be avoided.⁷

Regardless of the selection of an integrated solution or a portal solution to access, defining centralized guidelines for role assignment is a critical step in ensuring trust among HIE participants, and one that CRISP will manage. Managing the level of complexity is a function of determining the granularity in defining each role type. As the number of assignable roles increases, so does the complexity of managing those roles. Furthermore, participants must be able to rely on a participation agreement that defines a consistent approach to role assignment in order for the exchange to be successful. Without such an agreement, participants lack assurance that the data they release into the exchange are being used appropriately. CRISP will define the assignment of roles and access protocols in a common HIE policy guide and codify that definition in a contractual agreement allowing for the trust that is a prerequisite for clinical data exchange.

A Note on Emergency Access to Health Information

There are a number of scenarios whereby a provider may need access to health information that he or she would not normally be permitted to view, or for which a consumer has chosen to restrict access. To account for these circumstances, many HIE efforts have incorporated the concept of a “break the glass” function. This function would allow a provider to override the access level afforded them by the system’s role definitions discussed above. The CRISP model allows for an approach to break the glass scenarios whereby providers may gain access to data in critical situations but only if the patient has not otherwise restricted that function (as discussed earlier) through health record bank control or by making that request through the exchange call center. While the exchange will deploy a notice and opt-out model, that model does not imply that all information will be available to all participants. Role-based access will still define what information is presented to whom. In the event that a break the glass scenario does occur, and the patient had not restricted that scenario, a manual audit would occur. Providers that proceed with breaking the glass will be contacted to verify that they accessed the data for appropriate uses, and their actions may be evaluated.

Audit

The CRISP model is guided by the HIPAA Privacy Rule. That Rule mandates that “a covered entity must have in place appropriate administrative, technical, and physical safeguards to protect the privacy of protected health information.”⁸ The HIPAA Security Rule is more specific, requiring the implementation of “hardware, software, and/or procedural mechanisms that record and examine activity in information systems that contain or use electronic protected health information.”⁹ The Security Rule stipulates that covered entities “implement procedures to regularly review records of information system activity, such as audit logs, access reports, and security incident tracking reports.”¹⁰

The HIPAA requirements stipulate a minimum requirement; however, participating in an HIE increases both the need for stringent auditing processes and the complexity in executing auditing processes and procedures. The development of an HIE implies an increase in the number of users in the system, the number of transactions, and the diversity of those transactions within the network. With the high volume of transactions flowing through the exchange there is no feasible way to actively and manually monitor each transaction. Because the HIE will include both large and small providers that have varying audit and logging capabilities, CRISP will tend to avoid specific or complex audit requirements at the participant level and account for transactions flowing through the exchange through centralized auditing. This means that audit logs will be stored centrally at the exchange level, will include detailed information about the type of data accessed, by whom, and when, but will not store the actual health information in the audit log.

⁷ HIMSS Analytics, Things to Consider When Evaluating an Enterprise Single Sign-On Solution, 2006.

⁸ 45 CFR 164.530§(c)(1)

⁹ 45 CFR 164.312§(b)

¹⁰ 45 CFR 164.312§(a)(1) (ii)(d)

While random auditing can provide for base-level coverage, CRISP will assess the need for and implement specific rules that trigger audit events. Specific activities, to the extent feasible, could include:

1. Audit of all VIP records,
2. Procedures for follow-ups on suspicious activity, such as indications of possible privacy or security breaches,
3. Review of network intrusion detection system activity logs,
4. Review of system administrator authorizations and activities,
5. Review of physical access to data centers, and
6. Other review of technical, physical, and administrative safeguards as established by the policies of the HIE.¹¹

Similar to the balance that must be found within authentication; a balance exists in defining a robust but achievable audit program in the context of available resources. After the audit policies are defined from a system event and review perspective, mechanisms to disseminate incident reports and breach notifications will be established. Further, accountability actions will be established to handle breaches (discussed in more detail below), investigate complaints, and provide resolution or enforcement activities when such incidents occur.

An underlying theme, throughout business practice areas, is striking an effective balance between restrictive policies and requisite safeguards. Regardless of the final policies of participants, it will be CRISP's responsibility to ensure that all participants adhere to the minimum defined standard.

A Note on Breaches

In any health information exchange, it is impossible to completely eliminate the chance of breaches and misuse of information. Though an HIE itself is not necessarily a HIPAA-covered entity, any related business associate agreements would render the business associate responsible for adequately safeguarding protected health information and, as discussed above, the HITECH Act will require such safeguards of CRISP directly in the near future. As such, it will be critical to mitigate the probability of breaches and misuse through appropriate systems monitoring and established security, training and reporting procedures.

Pre-emptive measures will be taken to reduce the likelihood that health information is used for purposes other than those for which it was intended. Establishing policies and procedures and training personnel are two important actions that will be taken by CRISP. All policies and procedures will be clearly written to enforce privacy standards and communicated to staff accordingly. Additionally, workforce members with access to protected health information will be adequately educated to understand privacy standards and will be trained to adhere to procedures that uphold such standards.

In the event that a breach does occur, appropriate sanctions will be in place and enforced against any workforce member who violated proper procedures. Additionally, attempts will be made to rectify the extent of harm caused. For example, the individual whose data was compromised will be informed of the breach so that he or she can take necessary protective precautions. If the HIE is the source of the breach, the breach will be reported to affected providers promptly. Likewise, any breaches that originate with covered entities should be reported to the exchange.

Authorization

Authorization is closely linked to both access and authentication. After a user has identified himself (access) and proven that he is indeed who he claims to be (authentication), the HIE must verify which functions that user is authorized to perform.¹² These functions could be as simple as distinguishing between the ability to view data or view and contribute data, or they may involve more complex functions such as defining to the ability to see specific types of data and filtering various health data elements. The granularity that CRISP deems appropriate is a balance between complexity,

¹¹ Markle Foundation, *The Connecting for Health Common Framework: Resources for Implementing Private and Secure Health Information Exchange*, 2005.

¹² *Ibid.*

usability and administrative overhead of the exchange and will be arrived at in consultation with CRISP participants and consideration from the MHCC Policy Board.

As a base approach, providers should have the ability to view and save data for the purposes of treatment. Functionality that allows addition of new information and other clinical messaging capability will be reliant upon the access point the provider is leveraging. For example, at the lowest end of the spectrum a provider may be receiving a print-out, a form to view only, or may be viewing information on a portal, but not actively entering new information produced during the encounter. The functionality can grow from that point, however, the capabilities to view, contribute and save are critical components to long-term utilization and value creation.

Authentication

Authentication of HIE participants refers to the assertion of a particular identity through the provision of a certain set of identifying information.¹³ The management of authentication services through the HIE is similar whether access is through local EHR systems or through a portal access solution. In both access models, credentials will be passed into the exchange to be authenticated and for access to be granted.

CRISP will also define the methods for authentication. Varying levels of security measures exist in selecting the mechanism to uniquely assert an identity. The simplest form of authenticating an individual user is through the provision of a username and password, or single-factor authentication. Options that increase authentication security include the use of security tokens or smart cards (two-factor authentication) or perhaps even the use of biometric data (three-factor authentication). While CRISP does not necessarily need to prescribe the exact authentication requirements, a minimum standard must be established. CRISP believes, as a minimum, a username and strong password should be used to access the HIE. However, when accessing the HIE through a web-based application, CRISP will require additional security measures to be deployed. Use of a security token, increasing the authentication level to two-factor, can provide adequate security for web-based access. However, it should be noted, CRISP believes there are significant challenges with respect to HIE utilization as the requirements for authentication increase.

In short, CRISP will arrive at an appropriate balance between usability, security, and cost in consultation with CRISP partners and the MHCC Policy Board. If the authentication requirements are too onerous, then the HIE could face adoption challenges. However, if the requirements are too relaxed, the exchange will compromise its data protections and security and either suffer from breaches or the inherent lack of trust in an unsecure network.

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Markle Foundation, *The Connecting for Health Common Framework: Resources for Implementing Private and Secure Health Information Exchange*, 2005.

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Consumer Control – Access, Authorization and Authentication

CRISP will develop an HIE that has consumer access as a fundamental component of the design. The underlying concept in developing a citizen- or consumer-centric HIE model is that the consumer can act as a transformative agent of change regarding both the overall adoption of health IT as well as the associated improvements in provision of quality care, increased population wellness and decreased healthcare spending in the United States. In particular, content and social media have interesting intersections with consumer-centric and consumer-directed healthcare. As consumers become more engaged in their own care through health record banking applications and other patient-engagement tools, new opportunities to deliver relevant content, care alerts, and other health management-related information to address real world challenges, such as 30 day readmission rate reduction, become possible.

Consumers' interest in their own healthcare may seem a foregone conclusion; however consumers have been excluded, to a large extent, from the delivery of and payment for healthcare, leading to an overall lack of patient-centeredness.¹⁴ Counter to this shortcoming are the basic concepts of why consumers should have an interest in their healthcare, chief among them, the fact that the consumers' life and health is put at risk when a lack of information causes preventable errors.¹⁵ Further, consumers (patients), as the object of care, are frequently in the best position to collect and share information with their providers.^{16,17,18} CRISP has taken positions on a number of topics related to consumer-centric HIE when considering the policy implications of consumer engagement. These topics are addressed in the subsections below.

Consumer Access - Health Record Banks and Personal Health Records

A critical component of allowing consumers to play a more central role in their care is offering them enhanced access to their own health information. While PHRs have been given much attention and are commonly held as one solution to improve patient engagement, an important distinction must be made. This distinction also explains the lack of PHR adoption by consumers. Current PHR proliferation is largely based on the tethered PHR concept, meaning that the personal health record is tied directly to one source of data. These PHRs may offer a consumer insight in a particular, but often limited, data set (insurance claims data converted to clinical data, for example). However, they do not allow the consumer a robust, or 360-degree picture of health information from multiple sources, as would be possible through an HIE. Nor do they, for the most part, permit the consumer to interact with health information by, for instance, adding health information and commenting on existing information, then in turn, making that information available back through a network.¹⁹

The CRISP model views HRBs as a networked consumer access point, meaning the application is not tied directly to a particular source, but rather connected to the network directly and acting as a node on the exchange. From a policy perspective, HRBs can act as a means to support the principle of transparency by delivering terms of use and privacy policy information to consumers so they understand the uses and limitations regarding their health information. However, CRISP believes that no single HRB should be the statewide solution for consumer access to the health information exchange. While defining minimum standards relating to terms of use and privacy statements for HRBs, CRISP will promote market development of multiple solutions that can be built on the exchange and allow for a vast

14 Institute of Medicine, *Crossing the Quality Chasm: A New Health System for the 21st Century*. 2001.

15 Markle Foundation, *A Common Framework for Networked Personal Health Information*, June 2008.

16 Ibid.

17 Tang P et al. *Personal Health Records: Definitions, Benefits and Strategies for Overcoming Barriers to Adoption*, 2006.

18 Denton IC. *Will Patients use Electronic Personal Health Records? Responses From a Real-Life Experience*. 2001.

19 This concept to be discussed further in the section "Consumer's Control over the Flow of their Health Information"

array of value-added services to be offered to consumers. CRISP will also promote consumer choice with respect to the selection of a solution that best fits their needs.

Authentication of Consumers

A significant challenge in allowing consumers access to an HIE through health record bank applications is the process of authenticating their identity. Consumer authentication poses a different challenge than that of participant or provider authentication due to both the sheer volume of consumers compared with providers and the fact that provider participant authentication will typically initially occur face-to-face and include some exchange of credentials to bring the provider into the network. Without adequate authentication processes, health information could be released to the wrong individual. Further, consumers could open accounts and make incorrect data available to the exchange if the authentication process were not effective. CRISP believes that both of these scenarios are unacceptable and would be prohibitive to the development of a consumer-centric HIE.

The challenges that exist in many other areas of HIE with respect to the privacy and security risk of low requirements versus the usage barriers of strict requirements are certainly present when addressing consumer authentication through a networked HRB. In light of these challenges, CRISP believes the ideal authentication approach entails a review of a government-issued identification that includes a picture during a face-to-face encounter. While this approach can certainly prevent mass-automated attacks attempting to create accounts, CRISP acknowledges there are a few key problems. First, while face-to-face identity proofing using a government-issued ID has become a standard in multiple industries, there is no evidence to suggest that it is more effective than other mechanisms.²⁰ Second, the costs associated with face-to-face encounters may be too onerous, especially for new ventures offering HRBs. A second approach is to “bootstrap” existing authentication mechanisms by leveraging the existing processes (or opportunities for face-to-face encounters) of other organizations, such as financial institutions, hospitals, post offices or potentially the Department of Motor Vehicles. Further, the ability to deterministically authenticate an individual and subsequently correctly match that individual with health information may require manual intervention initially to ensure an adequate level of privacy and security protections. While CRISP has not decided on an exact approach to health record bank authentication, the organization will continue to evaluate authentication options for consumers. As a general rule, CRISP will put in place procedures that err on the side of privacy protection rather than usage, such as leveraging existing encounters at hospitals or physician offices. CRISP will ensure that any solution offered through the HIE has been vetted to ensure an appropriate level of rigor.

Consumer Control and Authorization over the Flow of Health Information

CRISP believes that consumers should also have the ability to augment their health record bank information and annotate data that was entered by providers. This does not mean they are modifying any record that exists at a provider site, but rather the copy that is stored in the consumer’s own account. Providers have expressed a lack of confidence in health information that is comingled incorporating both patient-entered and provider-entered data. The logic behind the CRISP ‘augment and annotate’ approach is that all data exchanged through the HIE will have source information, including a note if consumer-entered, associated with it that is readily available to providers to ensure they can either ask further questions if they require clarification from the patient or so that they may place what they deem to be the appropriate level of confidence in the data. This is not a new practice or concept; in today’s system, providers still rely on patients to confirm information or to provide additional information, such as if a prescription have been taken after written or filled. In the HIE, consumer annotation or provider-entered information will comeingle in the same manner, and can provide a physician with critical information about the patient at the point of care.

²⁰ Ibid.

Outreach and Education

Consumer Outreach and Education

Active participation from healthcare consumers is an obvious but vital factor in CRISP's ability to roll out a successful statewide HIE. It is imperative that the participation level is high for all consumers regardless of demographics and other consumer differences. CRISP is committed to implementing an HIE that is consumer-centric, providing consumers with new ways to interact with their health information and with their care providers. CRISP will assertively seek to educate consumers throughout the region on HIE and the benefits of participating in the exchange. CRISP believes that this education program will reduce hesitancy in consumers that may have limited knowledge of health IT and how information is communicated, shared, and utilized for their benefit. A statewide education effort will also provide consumers with the information they need to exert control over how their personal health data is managed.

CRISP understands that a variety of community outreach approaches must be deployed to connect with a large and diverse group of consumers. This includes educational marketing materials, presentations at conferences, podcasts, print media, radio, television, and Internet. CRISP believes a combination of these efforts should be deployed, tailoring the media to the audience to ensure both the simplicity and completeness of the message. Our approach will include mechanisms to ensure that we account for those in our communities that have lower literacy rates.

Examples of a robust outreach program to a variety of consumers are:

- Publishing all materials in various languages that are spoken in the region
- Publishing materials that are appropriate for a variety of educational levels
- Using community gathering locations for outreach and educational sessions (including faith-based organizations, community-based organizations, schools, health clinics, etc.)
- Placing informational brochures in non-traditional target locations within communities
- Offering educational opportunities during conferences that are geared towards those that work and support underserved communities

The efforts described above will be strategically marketed to appeal to the appropriate demographic to include the underserved population. Materials can be positioned in newspapers, magazines, radio stations, and cable TV channels typically selected by underserved audiences. Education through community kiosks can also be a non-threatening method with which many of the underserved are familiar. Community kiosks can provide an access point that connects consumers to the healthcare system for more effective care coordination. Strategically placed kiosks can also address some of the educational and environmental barriers, Internet access, for example, is often present in accessing quality and equitable care by vulnerable populations.

CRISP believes that an educated consumer will make wiser decisions about his or her current and future healthcare. It is essential to have participation from a diversity of consumers as the HIE is developed. This will be achieved by soliciting participation in 1) focus groups sponsored by community-based organizations such as churches and community health clinics; 2) convening of a series of workgroups made up of consumers and other stakeholders who would come together regularly to discuss the unique challenges to HIE adoption among all populations as a means of including the underserved and identifying areas of improvement. By offering a wide range of educational outlets throughout the state we are confident that our outreach efforts will be accessible and valuable to all consumers in the region.

While it is important to publicly describe, in general and non-technical terms, the mechanics of how the exchange services are deployed, this is a secondary issue in defining the message. More important is defining a message around the participant benefits of HIE services, as this will help in building and maintaining community willingness to support the exchange. The benefits of health information exchange can often be lost among fears of liability and privacy

concerns. While these issues are deserving of significant attention and deliberation, they should not be treated in the public messaging as insurmountable barriers to progress. CRISP will leverage the following guidelines for the definition of a clear message:

- Develop a message around the benefits of each service being deployed
- Understand the target population for the service
- Tailor a message to that population
- Release general information through traditional press avenues regarding the service
- Leverage the existing trust relationships between consumers and providers to reinforce the message

A successful HIE “brand” can serve to enhance both consumer and participant support for the exchange. Management of the message or brand does not imply avoidance of difficult and important topics, such as medical identity theft or data breaches, but rather discussion of those concerns in the context of the greater benefits of the exchange and the process by which those issues are being addressed. While CRISP emphasizes the importance of a media strategy that leverages traditional press avenues via press releases and participating organizations’ media relations offices, it also recognizes the importance of other means of releasing general information which may raise the HIE’s visibility. These means could include online marketing, an official HIE-specific blog, or a website with minutes from planning meetings and other relevant functions.

In addition to brand marketing, one-on-one marketing activities will also be a key element of the overall consumer outreach strategy.

- Educational marketing materials could be distributed to consumers through doctors’ offices, hospitals, clinics, and community centers.
- Presentations could also be given at consumer-centric or health-centric conferences, which bring large groups together and can facilitate healthy community discourse.
- Recent technologies, such as podcasts, games, and simulations, are also rapidly growing in popularity. It is expected that the number of Podcast users will more than double in the next five years, with 60% of those users living in the urban community.
- Programs like iTunes could be leveraged as methods of delivery for information.
- More traditional forms of media, such as magazines, newspapers, billboards, radio, and television, could be used to run ads or public service announcements.
- The Internet is quickly becoming one of society’s primary means for accessing information. Internet blogs, website article marketing, hosting an exchange site, and/or Google Adwords are all effective ways to get information out onto the Internet.

Provider Outreach and Education

CRISP realizes that without engaged physicians, there will be a significant barrier to adoption of HIE services. Our outreach plan will engage physicians in the HIE through education, involve them in decisions concerning design/implementation, and provide a feedback mechanism that will facilitate changes in a timely manner. These components are vital to increase physician EHR adoption and HIE participation.

Effectively reaching providers throughout the region will be a priority for CRISP, yet a challenge that we understand and respect. We will undoubtedly require a variety of methods to reach physician practices, both large and small, based throughout the state. Education should center on explanation, description, and benefits analysis of the exchange in improving healthcare quality and efficiency, preventing medical errors, and reducing healthcare costs by delivering essential information to the point of care. Education will also highlight the usefulness of an exchange for addressing issues such as quality and efficiency measurements, pay-for-performance, pay-for-participation, e-prescribing, and emerging care delivery models such as the Patient Centered Medical Home (PCMH) or, generically, the medical home.

CRISP's plan for physician outreach and education involves dividing the state into geographical territories based on Use Case deployments and the outcomes of a medical trading area study (MTA) and then assigning a Provider Outreach Coordinator (POC) based on the resulting data. The medical trading area study will be a valuable analysis in allowing CRISP to understand where patients in various geographies receive their care. The POCs' role in physician education will include coordinating and understanding practice readiness to participate in the HIE and leveraging multiple avenue to educate physicians regarding how they can participate. In efforts to further engage physician offices and identify potential barriers to implementation, our outreach will also include the opportunity for physicians and staff to make suggestions and comments. It is our hope that the creation of dialogue will support physician trust and inclusion in the HIE.

CRISP may use the following steps as a guide to implement the Physician Education initiative.

- Obtain the names, addresses, and telephone numbers of all family practice, internal medicine, pediatric, cardiology, and endocrinology specialty physicians in freestanding physician offices in Maryland. Determine the number of physician/physician groups in Maryland using the physician database provided by the Maryland Health Care Commission.
- Conduct a medical trading area study to understand the geographic areas of care in more detail.
- Assign Provider Outreach Coordinators, as appropriate, based on the outcome of the MTA study.
- Education programs will be developed based on outcomes of the MTA study, the Use Cases being deployed, and practices that are being targeted to participate or have interest in participating.

Physician Feedback Mechanism

Both during the educational outreach process as well as during participation in HIE, the physician community must have a reliable means for communicating to and participating in the governance of the exchange. CRISP will enable a feedback mechanism that will lend clarity to the perceived barriers and allow a deeper understanding of the issues as they relate directly to Maryland physicians. CRISP believes it is important that, where possible, the feedback loop be completed, and physicians receive acknowledgement of and a response to their substantive comments for improving the HIE. CRISP has already developed a website and will work towards developing physician engagement opportunities (online forums, FAQs, blogs) to serve as important "touch points."

Hospital Outreach and Education

Hospital systems have played a leadership role in CRISP's formation and its ability to meaningfully deliberate on the complex issues of HIE and arrive at general areas of consensus. Ensuring appropriate levels of participation and effective levels of outreach and education to hospitals is a critical component of the CRISP approach. CRISP will actively seek inclusion of hospitals that increase geographic and organizational diversity and allow for a true statewide HIE. CRISP will accomplish this goal through collaboration with the Maryland Hospital Association (MHA).

MHA will be a critical partner in allowing CRISP to communicate with hospitals broadly and consistently, educate hospital leadership when necessary, and ensure that the hospital community has a voice and a mechanism to interface with CRISP leadership. Collaboration with MHA does not imply the absence of direct hospital participation at various levels within CRISP. To the contrary it is meant to augment that participation and allow CRISP the opportunity to leverage expertise unique to MHA. As is the case with many efforts that are of the magnitude of a statewide HIE program, participation and counsel is often solicited from an array of constituents, but absent is a mechanism that allows for internal deliberation and an effective feedback loop. CRISP has held initial conversations with MHA about working collaboratively to define concrete and actionable ways for bidirectional communication with hospitals on issues related to HIE. Outcomes of those meetings suggest that CRISP will strive toward a participatory process rather than merely a representative process. The former inserts mechanism that enable a deeper level of engagement rather than the topical and often unfruitful involvement associated with the latter. MHA could act as a partner and facilitator to CRISP in a number of ways, including:

1. Forums and interaction opportunities

MHA can partner with CRISP to create and promote various venues for communicating directly with hospital staff and leadership. The sessions can take the form of conference calls and in-person meetings that allow hospitals who may or may not be directly involved in the governance of CRISP to listen to approaches and recent decision, ask questions, voice concerns, and offer divergent perspectives.

2. Development of briefings

CRISP will need to ensure consistent communication to hospitals outlining recent progress and any recent decisions related to the HIE. Frequent briefings will also serve to keep the HIE as an on-going fixture in hospital IT decision making. Further, these briefings will support the transparency that CRISP seeks in the development of an exchange. The medium for briefing can include both written or audiocasted options.

3. Creation and operation of feedback loops

As described above, CRISP recognizes that soliciting feedback is important, but demonstrating that feedback is incorporated into decision making can enhance and deepen the relationship with the hospital community. Creating a feedback loop that allows insight into how input has been included in deliberations will encourage on-going and meaningful participation.

4. Development of an education program for hospital leadership

Despite recent attention given to health information exchange through both state and federal activities, a natural gap still exists within hospitals in understanding how any statewide effort would affect their organization. There is a risk this gap could widen as detailed plans are established, especially if the appropriate leadership is not directly engaged in communicating the developing HIE plans, understanding priorities, sharing experiences, and answering questions. CRISP will work with MHA to close that gap.

5. Development of Use Case specific materials

During any Use case roll-out materials will need to be developed for both training and education purposes. These materials are designed to ensure that the provider or staff member who is interacting with the service understand both the technology and policy requirements, and also to communicate to patients important information about the service.



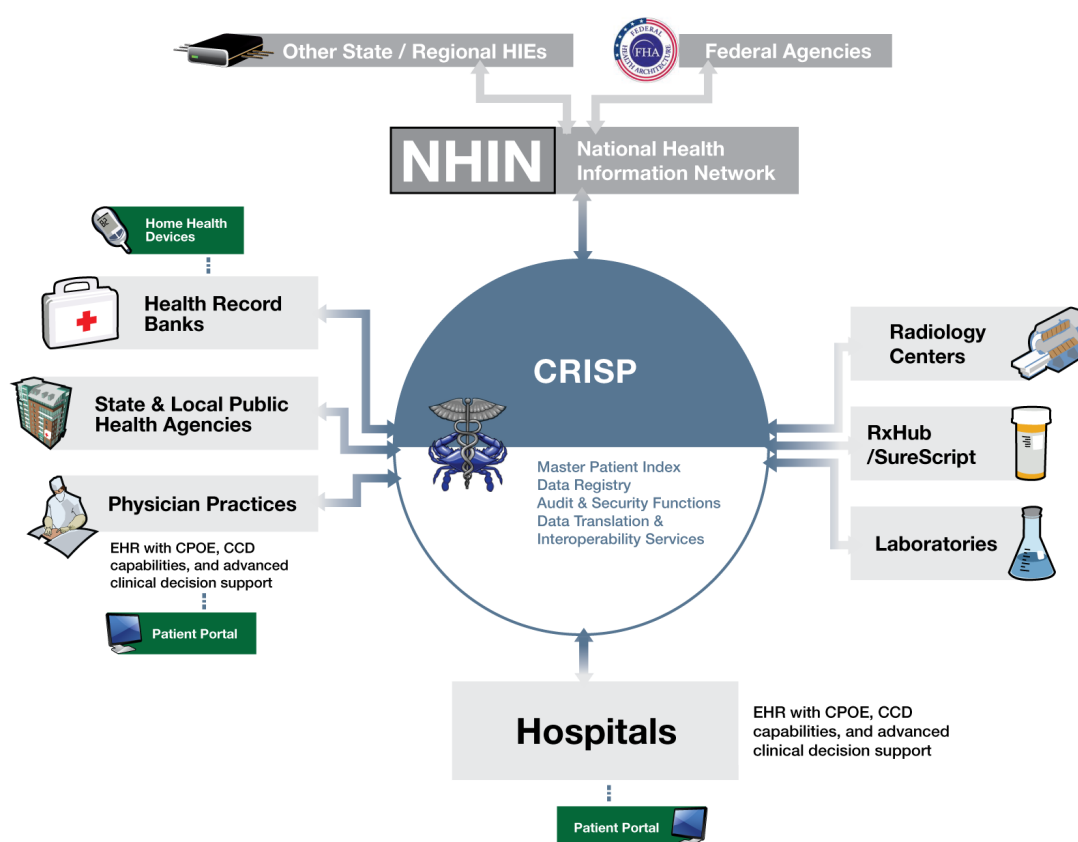
Medication History Patient FAQ Cover

CRISP's hospital communication, education and outreach efforts will certainly evolve over time to expand where effective and revise where deficient; however it is clear that MHA will be an important partner in effectively engaging the statewide community of hospitals.

Fundamental Design

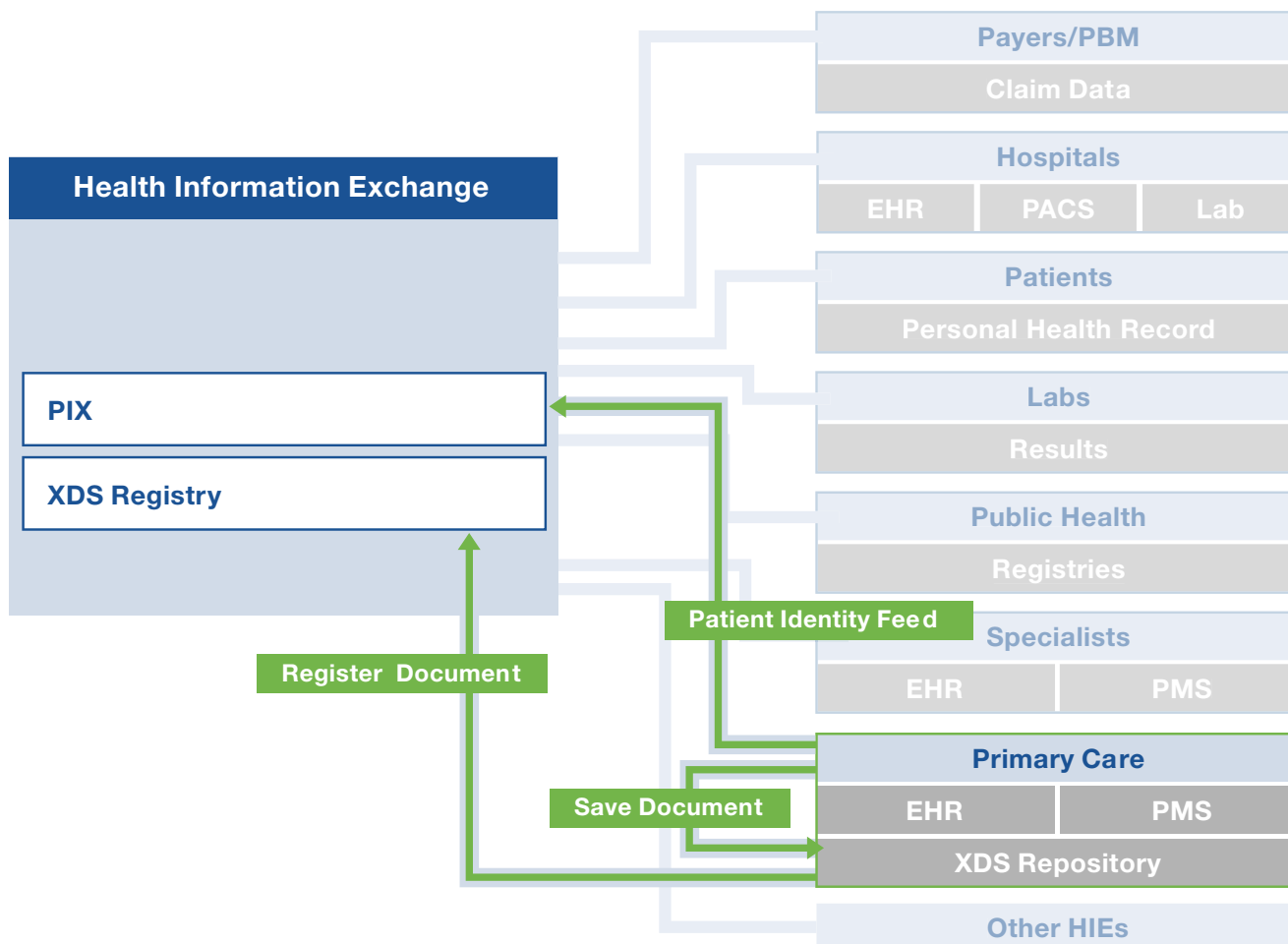
CRISP will build a hybrid, standards-based HIE. The exchange will operate using a Health Information Technology Standards Panel (HITSP)-endorsed infrastructure approach, appropriate for supporting both distributed data and health record banks (i.e. patient-controlled personal health records). This flexible approach will accommodate a distributed data model, such as envisioned by the Markle Foundation, with a master patient index and registry (i.e. a mechanism to locate records within the exchange). The distributed model ensures that data is held where it is created, therefore avoiding the negative perceptions and potential privacy and security consequences of storing all patient information in a large central HIE repository. At the same time, CRISP will plan for a market in which health record banking may become prevalent, with consumers actively selecting to create health record bank accounts to exert control of the flow of their health information within the exchange. CRISP supports the emergence of that model, in which health record banks and other PHR applications function as a node on the network.

The flexible, standards-based, hybrid infrastructure that CRISP will pursue will allow for the secure transfer of a defined set of clinical information between participating entities. The core infrastructure will leverage a distributed model developed in adherence to generally accepted specifications and standards. However, the model will not exclude, and will ultimately drive towards, the technical capability to include distributed repositories of consumer-controlled health information where it is deemed appropriate or in the interest of the consumer (as defined by the consumer). While CRISP believes the architecture model described above represents the vision for what the exchange should aim to achieve, the near-term clinical data exchange will only leverage portions of the functionality that can be deployed in the full-scale exchange, for example, the limited functionality required to achieve the electronic medication history service. CRISP will implement a model that demonstrates foresight by positioning Maryland's HIE infrastructure to account for market development in either a distributed or health record bank driven model.



Data

The figure below illustrates the high-level process by which an HIE participant would submit, store and register patient health information with the exchange.



Master Patient Index Data Load

As shown in the “Patient Identity Feed” line in the figure above, non-clinical patient attributes would be submitted to the central MPI leveraging an Integrating the Healthcare Enterprise (IHE) standard transaction. From a technical perspective, exchange participants could publish patient identity information on a nightly “batch” job basis, or based upon a number of events that could be defined by each participant, depending on various technical and/or policy constraints and decisions established by CRISP and the MHCC Policy Board.

Storage of Clinical Information

A critical concept in the exchange, and at the core of the architecture model, is that clinical data is not held in a single centralized repository on behalf of exchange participants. Each node on the exchange will store data locally in either their own (or shared) “edge devices” that are in turn made available to the exchange if an allowable request is received.

²¹ An edge device refers to the hardware and software where participants in the exchange store clinical data that they intend to make available to appropriate requests coming from other participants in the exchange. As EHR products develop towards the HITSP-endorsed and CCHIT-specified standards, direct communication between the exchange

²¹ The term “allowable” is intended to describe the constraints placed on access of data, even if on edge device, by patient preferences, role-based access rule and proper authentication into the exchange.

and the local EHR may become feasible. Of note, participants in the Maryland HIE will undoubtedly have varying levels of technical capability, and in the case of most physician practices, will be unlikely to have any existing technical infrastructure or EHR to connect into the exchange. To address this challenge, CRISP will seek to offer a physician portal to allow for early access to the HIE in the absence of a local EHR.

An important aspect of the storage of clinical information on an edge device is how consumers with health record bank accounts will interact with it. Health record bank applications will connect to the exchange in a manner similar to that of any other provider. By observing standard transaction sets and data architecture standards, enabled through the application they are interacting with, consumers will be afforded the ability to control data in a consumer oriented edge device separate from the central exchange infrastructure.

Registering Clinical Information with the Exchange

When an exchange participant stores data on an edge device, metadata about the data being stored is committed to a centralized document registry. The intent of the document registry is to maintain data about the location and type of documents that exist on the network. When a participant saves a document (for example a continuity of care document, or, CCD) to the exchange edge device, a standard IHE “register document” transaction is initiated that sends the necessary document identification information to the centralized registry.²²

Request for Data

The services of the HIE will operate with the agreement, amounting to the consent, of the patients whose information is being exchanged. As a baseline process, consumers will be notified about the existence of the HIE and their ability to opt-out of all exchange participation, meaning they can prohibit all of their health information from flowing through the exchange if they choose. The notice will describe the HIE, its purpose and its functions. In effect, opting-out will be the equivalent of being placed on a “do not call” or global suppression list. Depending upon the Use Case and associated data, additional patient consent protocols will be employed over and above the full exchange opt-out.

In practice this means all patients will be included in the exchange by default, unless they ask not to be. For those consumers that participate, the exchange will be available for a variety of purposes, some of which will require additional patient consent or authorization under HIPAA and the Maryland CMRA, and some of which will operate without explicit patient approvals. For instance, a hospital ER will ask verbal approval from any patient capable of indicating consent before they use the HIE to query external sources of medication history. On the other hand, a laboratory will not seek any additional patient consent before transmitting lab results across the HIE to an ordering physician. The details of the base line opt-out process is discussed in more detail in the ‘Central Infrastructure’ section in response to RFA questions specific to global opt-out practices.

Exchange of Data

CRISP has defined an incremental strategy to deploying the HIE. That incremental strategy is rooted in the knowledge that moving too quickly in an environment as nascent as the HIE field could lead to unintended consequences for CRISP and HIE participants. However, incrementalism does not negate our ability to be progressive, forward thinking, and to produce results at a faster rate than previously observed in other efforts. A non-incremental implementation strategy would militate against progress due to the overly aggressive agenda and the inability to align participants with that agenda.

CRISP believes that our thinking with respect to the ordering of data availability (which we frequently refer to as Use Cases) closely parallels the thinking of the MHCC. Further, it is based on a number of underlying criteria. Those criteria include the clinical value of the data, the clinical demand for the data, the technical requirements for making that

data available, and the legal and policy framework necessary to support the availability of that data through the HIE. CRISP feels that the Use Cases defined later in this response reflect the optimal ordering of data availability and the supporting logic for the ordering.

CRISP has maintained that medication history information delivered to the emergency department is of critical importance and meets the litmus test of value across the criteria described above. Following medication information, lab results data, ED discharge summary data, clinical summary documents, and radiology reports are of most importance. It is within the clinical summary document that the details of what constitute a clinical summary become relevant. CRISP believes that a constrained version of the HITSP CCD C32 document should be the document standard, however, defining which data to use to populate that document standard is an important task. CRISP believes that basic data such as medications, allergies, and problems lists should be included, and will strive to ensure participants are able to include that information when publishing a clinical summary to an edge device. Further information, such as past hospitalizations and past surgeries may also be included; however, CRISP recognizes that each participant may have technical constraints that create significant hardships to make that information available to the exchange. Early stages of the HIE would seek to enable the exchange of medication information, lab results, discharge summaries and clinical summaries between participating entities. Using the CCD document standard will allow CRISP to be flexible in that clinical summaries can be populated with varying amounts of data depending on the capability of the participant; therefore not all participants have to be on a level technology playing field in order to supply data. CRISP can avoid the exclusion of participants based on technology that can otherwise be effective consumers and providers of health information.

Persistence of information in edge devices highlights the concept of control over health information and the ability for the information to be updated or deleted. Information in edge servers does not necessarily need an expiration/auto-delete date. If data were to be deleted from an edge device, the data in the originating system would still exist, and all logs of access to the previous data would persist in the HIE audit log. Indeed, persistence of data in edge devices could very well become an issue of relevance for the HIE. While queries could be tailored to only retrieve data for a certain past period, CRISP will require our policy and technology committees to address this question directly by evaluating the circumstances in which deleting data from edge servers would be appropriate.

CRISP acknowledges that new information, new thinking and new participants in the HIE deployment process may suggest alternative priorities to data availability; for example, medication histories may be found to be of lesser near-term importance than lab results delivery. CRISP is dedicated to working with the various stakeholders and the state partners to ensure that modifications to the approach are well thought through and executed.

Publishing Data

CRISP believes that the RFA correctly distinguishes between the publishing of data to edge devices, as described above, and the publishing of medications, lab results, radiology reports, radiology images and pathology reports. Lab, radiology and pathology results and reports are treated differently than medication information. For primary/clinical uses of the information, the ancillary data will simply be routed from the processing facility (lab, imaging center) through the HIE to the ordering physician along with any copies to other physician that have requested them. CRISP will also explore, with its state partners, the opportunities related to deployment of an HIE edge device dedicated to historical lab and radiology information. However, this information may be redundant in that the ordering physicians will likely incorporate the data into their local record, thereby rendering this record accessible via the edge server.

Exchanging medication information involves a different set of considerations. Accuracy of medication information is challenging in that medications are prescribed by multiple physicians, records of those medications are housed by multiple systems, and perhaps most challenging, patients may not be taking the medication with the prescribed frequency, dosage, or even at all. CRISP has leveraged SureScripts/RxHub as a source of medication information derived from both pharmacy data (SureScripts) and claims data (RxHub). This data will be accessed by routing a request from providers through the HIE to SureScripts/RxHub and locating the patient using that company's MPI

service. CRISP believes this data is valuable. Also, the number of participants in the SureScripts/RxHub network is increasing. Therefore, more data should be available as time progresses. However, in the current model, access to the medication data is accompanied by a significant transaction fee. CRISP believes that designation as a statewide HIE will afford price reductions through economies of scale. However, an active and current debate exists with respect to the pricing methodologies that SureScripts/RxHub have deployed, and CRISP will sustain its attention to, and if awarded the requested grant will consider entering, this developing debate. As the HIE evolves, the ability for consumers to maintain medication history information in their own PHR/HRB will be possible and ultimately could become the best source of accurate medication data.

Central Infrastructure

Master Patient Indexing

For a health information exchange to function, providers need a reliable way of matching their patients with available records in the network. This is no trivial task, and even within a single enterprise matching a person with his or her past records is not always easy. The CRISP aim is for accuracy within a framework of achievability and pragmatism. It is our judgment that a plan requiring significant near-term changes to providers' internal systems would be difficult and expensive to implement.

The CRISP team will deploy the IHE Patient Identity Cross-Reference (PIX) approach to patient matching. In general terms, the PIX manager is a layer on an MPI that is operated within the exchange. Each record in the PIX contains cross-references to medical record numbers (MRN) located at participating institutions. In essence, the PIX can translate the MRN of one provider to the MRN of another provider. The initial link (linking a provider MRN to an existing PIX record) is initiated through statistical matching. That matching can be refined to avoid errors and final linking can be resolved either through probabilistic or deterministic matching, which is discussed in more detail below. The CRISP approach is similar to deploying a record locator service (RLS), however leverages an independent MPI and independent registry, separating their functions in pursuit of a service oriented architecture approach.

The early CRISP Use Cases will not require providers who are only consuming/receiving data to write PIX feeds to the exchange MPI. Instead, receiving providers can send demographic data to the exchange to be matched probabilistically to the MPIs of data suppliers/senders (RxHub's Initiate Systems MPI for example) to obtain available data. It is only when an institution becomes a supplier/sender of data that their MPI will need to be fed to the PIX.

MPI Discussion

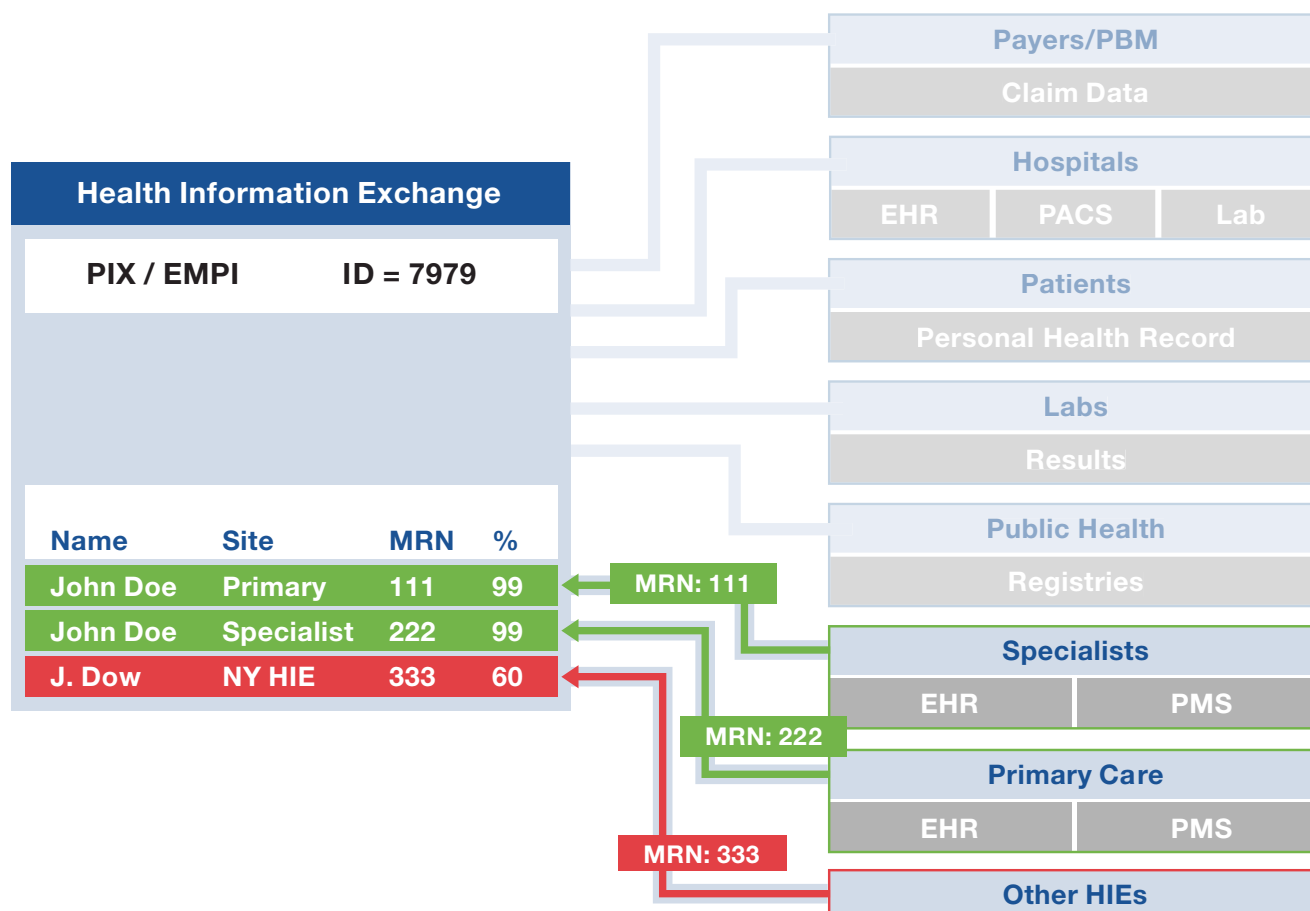
The objective of the CRISP MPI strategy will be to maximize the positive identification of subject patients while minimizing both false positives and false negatives. The CRISP approach will use the IHE PIX integration profile and will account for demographic data variation (ex: first name as John vs. Jonathan) and human entry error (ex: zip code or birthday number transposition) with weighted scoring assignments to each data element based on possible variations. The MPI will run algorithms against the existing demographic information to preprocess the database to determine the frequency of every attribute and will score the match according to the discriminating ability of the specific attributes of that database. The limits of acceptance and rejection will be tailored to the size of the population and the risk tolerance of both false negative and false positives.²³ CRISP will need to identify the set of demographic and identity information (and arrive at an agreement from each participant to use those data sets) used in the PIX feed transactions.

In the diagram below, HIE participants are submitting a standardized patient identity feed to populate the centralized MPI. Based on a centrally defined set of non-clinical patient information, a standard message will be sent to the central exchange MPI.²⁴ If the subject patient already exists in the MPI, then the inbound transaction will be cross-referenced

23 Rand Corporation. "Identity Crisis: An Examination of the Costs and Benefits of a Unique Patient Identifier for the U.S. Health Care System" 2008.

24 While figures 2, 3 and 4 are presented differently than the conceptual version offered in figure 1, they represent the same thinking with respect to the architecture model.

against the existing record and added as a new medical record number (MRN) associated with the MPI ID. If the patient is a new entry, a new MPI record will be created and all subsequent inbound feeds will be cross-referenced with the new record.



A Note on Patient Record Identification Using Statistical Matching Methods

The Joint Commission on Accreditation of Healthcare Organizations identified accurate patient identification as the number one goal in defining their National Patient Safety Goals for the Hospital Program in 2008, underscoring the importance of this issue in the broader context of a health information exchange.²⁵ CRISP understands the shortcomings of statistical matching and the difficulty in maintaining an accurate database of demographic information that can properly identify an individual. The Rand Corporation conducted an exhaustive review of statistical matching methodology outlining the issues, stating that the “problem with personal attribute keys such as name and address is that they are usually not unique to the individual, change over time, and are often entered into different systems in different formats. Any data-entry errors, such as misspellings, add to the difficulties with this type of key.”²⁶ CRISP recognizes that while patient matching and creation of a centralized MPI will be challenging, they are not an insurmountable task and existing technologies and processes can achieve a high percentage of successful matching results and avoid, to a large degree, the number of false positive returns.²⁷

25 The Joint Commission, Available on the Joint Commission website at http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/08_hap_npsgs.htm

26 Rand Corporation. “Identity Crisis, An Examination of the Costs and Benefits of a Unique Patient Identifier for the U.S. Health Care System” 2008.

27 A false positive return is when a patient is inaccurately linked to a different patient’s medical record. For a comprehensive review of the Universal Patient Identifier and Statistical Matching issues see Rand Corporation’s “Identity Crisis, An Examination of the Costs and Benefits of a Unique Patient Identifier for the U.S. Health Care System.”

Comparing Probabilistic and Deterministic PIX Record Linking

As discussed in the section above, there are significant challenges and risks inherent in maintaining an accurate MPI that is rooted in statistical matching techniques. However, effectively mitigating those risks is possible. An understanding of the difference between probabilistic and deterministic record linking within a PIX/MPI is critical in evaluating the overall risk of false-positive and false-negative linking. Relying on a completely automated probabilistic record matching and linking approach requires an extremely high threshold for accuracy to limit the potential for false-positives, thereby increasing false-negative outcomes as a result.

An effective PIX/MPI solution will require some degree of manual intervention and ongoing human attention to linking. Deterministic matching includes manual intervention by escalating MPI matching events that do not meet the threshold requirements established by CRISP. CRISP will apply resources to evaluate the records and try to determine whether or not they do in fact refer to the same person. The resource will use a combination of intelligence, common sense and investigation to make this determination. For example, if the last two numbers of the Social Security number were transposed, the deterministic logic may “kick out” the matching request for inspection. The CRISP support resource will determine that the records match and that the numbers were likely transposed. The resource will then manually merge the records. If the matching issue is not as straightforward as a transposition, the resource may need to do some more investigation by perhaps calling the organization where the record originated to see if it has more information on the patient that could help make a determination.

Opt-Out as the Baseline Consent Process

The overall HIE will function on an opt-out principle. By default, demographic information from any patient treated at a participating provider organization will be included in an MPI hosted by the exchange. Basic personal information such as name, gender, address, and birth date will be transmitted, captured, and stored in secure computers owned or contracted for use by CRISP. A separate database, and a component of the core HIE technology, called a registry, will house information, or metadata, about what kind of health information about a particular patient is in the exchange and where that information can be found (i.e. which participant is storing it). Both technical and privacy justifications drive the need for separate MPI and registry databases, instead of keeping all patient identifying and record locating information in one database/service. CRISP will only serve as the roadmap and secure transport mechanism to find and retrieve records.

Consumers will be able to opt-out of the exchange, becoming “non-participants,” by calling a toll-free phone number and requesting to be excluded, meaning their information will still be present in provider databases available to the exchange, within participant organizations, but the registry information required to locate this information will be erased. The exchange will block access to registry entries for non-participants, thus preventing their medical records from being found or transmitted. No provider generated exceptions (break the glass) to obtain information for a non-participant will be permitted. CRISP, in the early phases of the exchange, will not allow patients any granular control at the HIE level to exclude some records but include others. Nor will CRISP allow patients to pick and choose which providers have access to their information.

If they choose, hospitals and other providers will be able to allow patients greater control over which of their records are published to the HIE, by limiting the information that is made available to other participants. However, we would expect many providers to respond to requests from their patients that they not publish their records by instructing those individuals to simply opt-out of the exchange. This expectation is based on strong and consistent feedback from providers participating in the Medication History Project operated by CRISP participant organizations that the consent management process must be easy to manage. The easiest process for the providers will be to rely on the HIE to manage the opting-out of people who choose not to participate. Thus, in most cases, consumers will either be fully-in or fully-out of the exchange, with one exception described in the section below.

Even when a consumer opts out, some demographic information will always need to be maintained by the HIE, but only

to the extent necessary to ensure the person's current and future records are blocked. Reversing the opt-out decision will be possible. Opting back in will require either an in-person visit and presentation of appropriate identification or a two-step process in which a letter is mailed to the consumer's address and the consumer must confirm receipt.

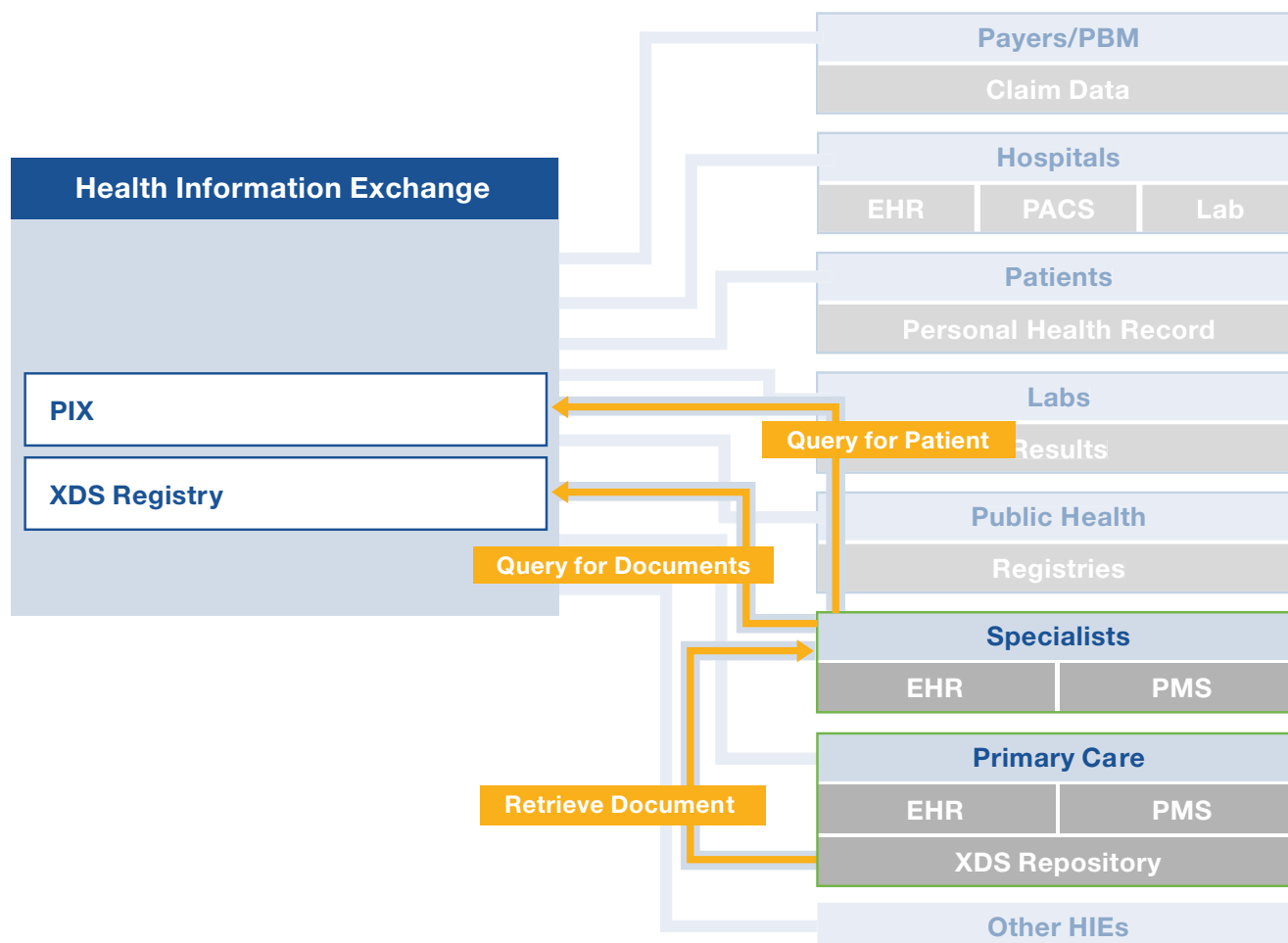
The Health Record Bank and Personal Health Record Exception

HRBs and PHRs will be an exception to the all-in or all-out concept. A consumer will have the option of excluding him or herself from the exchange for all other data transfer, while still allowing information to flow from an HRB to a health care provider. This feature of the HIE is designed for consumers desiring more granularity than an all-out option. An HRB or PHR will be the best solution for those consumers.

As consumer access applications such as HRBs and PHRs become more available, user controls within those applications will allow the consumer to manage the flow of his or her personal health information within the HIE, as long as those applications adhere to the technical and privacy standards established by CRISP and the Policy Board. When a query is initiated, the transaction process flow will include a reference to consumer-defined configurations for access to health information. The patient will have the ability to change those controls in real-time or near real-time to modify which providers have access to his or her information, what information they have access to and the duration of access for a given provider. By creating a health record bank account, consumers can opt-out of the full TPO exchange of their data and exercise greater control over what elements of their health records are shared through the HIE.

CRISP believes that the ability of the HIE to interoperate with individual health record banks or personal health records systems will facilitate broader and earlier participation by individuals in the HIE, even if it is limited due to issues of patient acceptance of an HIE, since it provides a means for granular control by individuals of what information goes through the exchange. This level of control is otherwise, in CRISP's view, simply not feasible for an HIE generally at this point in time and for the near future. A model that encourages participation through HRBs and PHRs helps to achieve the state's mission of a citizen-centric model for HIE.

Locating and Retrieving Records through the Exchange



Reading the Master Patient Index

When a participant in the exchange is attempting to locate a patient in the exchange, that participant will send a request to the PIX manager (i.e. the MPI) by submitting a standardized PIX Query, noted in the figure above as the “Query for Patient” line. The PIX Query transaction carries the local MRN and locates that MRN within the PIX manager. Once found, the PIX Manager, as the name suggests, will cross-reference the submitted MRN with the other record numbers that have been associated with that MRN when the original PIX feeds were submitted to the exchange.

Providers also have the ability to query the exchange using demographic information for those patient encounters for which no MRN has previously been established or communicated with the PIX manager for cross-referencing. The Patient Demographic Query (PDQ) transaction will allow basic patient demographic information to be submitted to the MPI for patient location by leveraging statistical matching.

Locating Clinical Information in the Exchange

After successfully locating the patient, a transaction will be executed to locate records for that patient within the

centralized registry, illustrated in the figure as the “Query for Documents” line.²⁸ It is important to note that the data housed in the registry is not clinical data and is only metadata about the location and type of information available on edge devices and other repositories connected to the exchange. Information in the registry can then be presented to the participant as a list of clinical documents available in the exchange or normalized and compiled into a single clinical summary. The list of documents presented to the participant is dependent upon the access rights defined for the participant role within the exchange. While data may be presented to the participant as a list, other data delivery options exist and are discussed in both the Use Case section of this report.

Retrieving Clinical Information from the Exchange

Following the initial PIX Query and the subsequent query and response of the exchange registry, the participant will have the option to select a document from the registry that he wishes to exchange, again, dependent upon their access rights to view that document. When a participant selects a document from the registry list, a Retrieve Document transaction will be initiated (noted in the figure as the “Retrieve Document” line) that will send a request to the edge device storing the clinical information. When the request is accepted, that clinical document will be presented to the requesting participant.

The process defined above for the retrieval of clinical information implies a “pause” in the location of patient records at the exchange registry level for review of available documents. However, scenarios exist whereby a participant may prefer to receive core clinical data about a patient without the additional workflow of selecting clinical documents from a list of all available documents. In this scenario, the exchange may identify, locate and deliver a core document, defined by the document type, to be delivered to the requesting provider.

28 IHE transaction available at http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_5-0_Vol2_FT_2008-12-12.pdf.

Technical Architecture

The CRISP Technology Approach

Overview

In responding to the RFA CRISP has sought to define a specific technology approach. However, we did not feel it would be possible to responsibly procure a technology vendor prior to responding to the RFA. If awarded the implementation grant, CRISP intends to initiate a formal, competitive, and transparent technology procurement process to ensure that Maryland and its citizens are best served. To that end, CRISP developed a request for information (RFI) document to assist in our response. The intent of our RFI process was to gather information on the technical capabilities of vendors in order to assess the ability of each vendor to meet specific requirements defined in both the RFA and in CRISP's proposed approach.

The RFI Process

CRISP developed the RFI to gather information that would inform our response to the MHCC/HSCRC RFA. Our aim was to ensure that CRISP did not respond without a detailed understanding of what technology was commercially available and what other technology may be in a beta or development state. The RFI was developed using questions directly from the RFA and from CRISP's in-house expertise. The RFI contained twenty-four questions related to infrastructure capabilities, data and security standards, use of IHE Integration Profiles, and ability to support specific Use Cases. The RFI was then publicly posted on CRISP's website as well as emailed directly to a group of approximately thirty vendors, chosen based on their role in the market, reputation, and recommendations from CRISP participants. These vendors represented a spectrum of health IT companies, ranging from off-the-shelf product vendors, component vendors (e.g. MPI), to systems integrators. CRISP received seventeen responses to the RFI, which were valuable in responding to the RFA. Throughout the process, CRISP had continual engagement by our legal counsel to ensure that the document and the process were structured appropriately.

The RFP Process

If awarded, CRISP will develop and issue a request for proposal (RFP) soliciting responses from the vendor community to provide the underlying HIE infrastructure. Through previous efforts and through the RFI process described above, CRISP has taken the appropriate steps to ensure that the soundness of our technology approach, described in this response, is viable. CRISP will codify this approach into an RFP and will execute an open, transparent, and competitive procurement process, similar to that of state government. CRISP recognizes the provision requiring MHCC participation and welcomes its staff's expertise and role in the RFP process. CRISP will empanel an expert RFP evaluation committee leveraging subject matter experts from CRISP member organizations and other partners. CRISP believes this is the most effective way to procure the appropriate technology to enable the HIE goals described in this response.

Infrastructure

As noted in the "Fundamental Design" section above, CRISP will deploy a hybrid infrastructure supportive of decentralized data and services leveraging an MPI and a data registry to locate health information in edge servers. In some cases, such as lab results, radiology reports, pathology reports, and medication histories, clinical data will not be held in edge servers, but rather routed from the lab or imaging center to the ordering physician. At a higher level, however, CRISP feels it is critical to address the overall interoperability challenge with an approach that allows us to achieve the fundamental design principles that we share with the state. At the same time, we seek to avoid alienating participants who may be operating proprietary systems.

Service Oriented Architecture

CRISP embraces the service oriented architecture (SOA) approach that is inherent in our model and, we believe, is necessary for the long-term viability of the HIE. The HIE infrastructure is comprised of numerous services that will run on an enterprise service layer and enable the core functions of the HIE. By incorporating an SOA approach into our design, CRISP can ensure that the HIE can take advantage of developing and advancing services and not be reliant upon a single service provider for all services. CRISP has articulated a number of the services earlier in this response. Nonetheless, it may be appropriate and useful to re-enumerate the HIE core services in this section. They include:

- Master Person Indexing
- Provider Identity Management Services
- Registry Services
- Repository Services
- Authentication Services
- Audit Services
- Nomenclature Normalization Services
- Consent / Authorization Management Services
- Network Monitoring Services

New services will certainly be introduced as the HIE evolves. For example, a service to manage the relationship with the National Health Information Network (NHIN) and Federal Health Architecture (FHA) will at some date be necessary.

Stakeholder Implementation Guides

As a principle, CRISP believes that innovation and improvement within the HIE will be a function of market-mechanisms and competition. As another principle, CRISP believes it is important to equitably serve the entire Maryland healthcare community. The development of stakeholder implementation guides are a good example of an area where matters of principle can transform into functional realities.

Stakeholder implementation guides are a critical tool in enabling the growth of the HIE. CRISP understands the constraints of limited resources in addressing an effort as substantial as the statewide HIE rollout. By developing and offering stakeholder implementation guides CRISP can avoid a significant amount of integration effort and enable participant resources to manage much of the development effort. For example, CRISP will publish the definition of a constrained CCD C32 document to allow participants to understand what health information should be published to which segment and what are required versus optional fields. The guide will also assist participants in understanding which IHE profiles are being leveraged for specific Use Cases and how they are deployed.

Implementation guides will also play an important role in allowing commercially viable services to be developed on the exchange. CRISP will enable health record banks and other consumer access applications to be developed on the exchange infrastructure. In order to do this effectively, CRISP will need to publish technology and authentication standards and testing guidelines to ensure that those companies who seek to offer a service or product on the exchange have the necessary information and resources to do so.

Interstate Exchange

CRISP recognizes that while our primary focus and resources are directed towards enabling statewide health information exchange in Maryland, we must also understand the opportunities to achieve broader exchange across state borders. Over the last two years and through the many existing relationships of CRISP members, we have had the

opportunity to share ideas and learn from other HIE efforts around the country. These relationships and knowledge of other activities, especially those of contiguous states or small-scale/service area HIEs that exist within our state borders, will become significantly more important as the CRISP HIE develops. Exchanging data across state boundaries is also significant because of the known patient overlap with the District of Columbia and Northern Virginia. Further, a CRISP member, MedStar Health, has hospitals that are located both in Maryland and Washington, D.C.

Activity in all contiguous states and in D.C. suggests that Maryland could play a central role in a larger regional initiative. Specifically, Delaware Health Information Network (DHIN), the planning work of NOVARHIO, MedVirginia, DC RHIO and activities in Pennsylvania and West Virginia create a fertile ground to enable cross-border exchange. However, CRISP is cognizant of the significant challenges that varying state privacy laws create and will approach any consideration of cross-border exchange cautiously.

Relationships and opportunities through the NHIN and FHA are also of relevance to cross border exchange and in enabling exchange in Maryland that would not be otherwise possible. The FHA has created a gateway to more than twenty federal agencies that allows multiple new Use Cases, such as Wounded Warrior through the Department of Defense and Veterans Administration as well as Disability Determination through Social Security Administration.

While the opportunities are many, CRISP stresses the need to maintain focus on our statewide HIE objectives. Focus on our objectives does not imply we must avoid consideration of the regional opportunities, but we must be prudent and incremental. To date, CRISP has been forward thinking without sacrificing our pragmatism and we will extend that flexibility into the implementation phase.

Underserved Populations

CRISP participants recognize the importance of including communities facing health and healthcare disparities (i.e. inequities) in our plans. The inherent challenges of HIE could threaten to exclude this important population as the complexity of basic HIE issues are addressed. CRISP has ensured that resources and focus remain directed to this particular component of the overall HIE equation. Improvements in the cost or quality of care delivered to these populations are critical to transforming American healthcare.

More specifically, CRISP has already engaged a number of safety net clinics, federally qualified health centers, and underserved advocacy groups in its planning efforts. For instance, CRISP has previously worked with the Summit Health Institute for Research and Education (SHIRE), Baltimore Medical System (BMS), Community Health Integrated Partners (CHIP), and the Shepherd's Clinic. These organizations have provided invaluable insight to CRISP in understanding underserved populations and developing plans to include them in HIE Use Cases and in creating effective outreach and education approaches. CRISP is dedicated to continuing to focus on underserved populations as implementation proceeds.

Interoperability

CRISP believes that the Integrating the Healthcare Enterprise approach to health information exchange represents an approach to standards-based statewide health information exchange that will allow CRISP and Maryland to achieve cross-organizational interoperability.

IHE is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical needs in support of optimal patient care. Systems developed in accordance with IHE communicate with one another better, are easier to implement, and enable care providers to use information more effectively. Standards provide the basis for

such a framework, but alone do not solve the problem. In any standard there are gaps, options, room for conflicting interpretations. No standard maps perfectly to the complex and ever-changing information domain of a healthcare enterprise. Filling the gap between standards and systems integration has, until now, required expensive, site-specific interface development. To close that gap a process for building a detailed framework for the implementation of standards is needed. IHE provides that process.²⁹

IHE has defined specific “profiles” aimed at constraining existing standards to defined implementation guides. IHE profiles organize and leverage the integration capabilities that can be achieved by coordinated implementation of communication standards, such as DICOM, HL7, and security standards. They provide precise definitions of how standards can be implemented to meet specific clinical needs.³⁰ HITSP has endorsed a number of the IHE Profiles that will enable broad health information exchange.³¹ Furthermore, EHR vendors are beginning to build functionality into their products that can enable interoperability from the native EHR system, in some cases negating the requirement for the installation of an edge device that would allow an HIE participant to trade data with the health information exchange.³²

While CRISP believes that IHE creates opportunities to resolve previous interoperability challenges and that the organization is enjoying broad adoption of their work, there still remains transaction or functional areas that do not have IHE specifications, or for which the IHE approach has not yet been endorsed by HITSP. We feel being myopic in our approach will only yield a result that requires significant rework as interoperability efforts of IHE and other standards development organizations continue. One of CRISP’s strengths is our willingness to be flexible in light of a changing landscape and deploying an SOA model that will allow us to do so. Therefore, our approach will leverage a number of HITSP-endorsed IHE profiles necessary to enable the functionality described in this response as well as ensuring emerging standards and interoperability specifications that have been endorsed by the appropriate oversight committee are included, where necessary, into our model.

The health IT industry has suffered from inconsistent definitions of industry terms as basic as “EHR” and “RHIO”, causing widespread ambiguity in definitions among the industry and confusion among the public.³³ In an effort to articulate and define interoperability, the standards-setting organization HL7 published a white paper dividing interoperability into three categories that include technical, semantic and process interoperability.³⁴ CRISP believes that HL7’s three part definition accurately describes the interoperability challenges and areas of focus for our organization. A review of the categories of interoperability follows.

Technical Interoperability

Technical interoperability focuses on the physical transmission and receipt of health data.³⁵ The challenge of physical transmission of data exists within individual hospitals and is compounded as the scale of any HIE effort increases. The deployment and use of systems that were built on proprietary standards has created a technical environment in which system-to-system and provider-to-provider communication and information transfer is a significant hurdle often requiring intensive time, human resources, and financial commitment to overcome. However, the work of a number of federal agencies and private organizations has created progress in a direction that will enable interoperability—and ultimately has the potential to foster seamless transfer of information between HIE participants.

Semantic Interoperability

Semantic interoperability focuses on the shared meaning between sending and receiving partners, ensuring that the meaning of what is sent is consistent with the meaning of what is received.³⁶ Much of the work in this area is focused on

²⁹ Integrating the Healthcare Enterprise, Available on the IHE website at <http://www.ihe.net/About/index.cfm>

³⁰ Ibid.

³¹ As presented by Charles Parisot, IHE IT Infrastructure Planning Committee Co-Chair, in “IHE and US National Health IT Initiatives”.

³² by individual conversations held by Scott Afzal, CRISP project manager, with various EHR vendors.

³³ NAHIT Report to the Office of the National Coordinator for Health IT, Defining Key Health IT Technology Terms, April, 2008.

³⁴ Health Level 7, EHR Interoperability Workgroup, Coming to Terms: Scoping Interoperability for Healthcare, February, 2007.

³⁵ Ibid

³⁶ Ibid

medical terminologies that can be referenced consistently by all parties. While use of many of these semantic standards will vary widely across potential HIE participants, a critical evaluation of their application to exchange services is important to ensuring common understanding of shared data.

Process Interoperability

Many health IT projects fail due to the fact that project managers did not consider how existing clinical workflows may need to be changed in order to best utilize the new technology. Further, clinical staff may not adopt technology if not properly trained and educated on the technology's benefits. Process interoperability focuses on higher-order workflow concepts that make data sharing a richer and more valuable experience for caregivers and, ultimately, the patient receiving care.³⁷ Work in this area involves understanding how shared health data supports the specific activities and workflow of the organizations that use it as well as the integration of health data into the work setting. Examples include process considerations related to usability and timeliness.

Personal Health Records

PHRs and HRBs are a key component of our response and a critical factor in driving towards a citizen-centric HIE. CRISP will deploy an HIE that will allow health record banks and other consumer access applications to act as nodes on the HIE, similar to any other provider participant. CRISP does not believe robust consumer access will be enabled in the early phases of the HIE, but rather after early phase functionality has been deployed and is in use. In practice, this implies that PHRs/HRBs will adhere to similar IHE integration standards supporting the standardized transactions discussed earlier in this section. However, HRBs will likely be offered by commercial businesses targeting specific consumer demographics, therefore the functionality of each application may vary based on the intended target and specifics of the business case. CRISP will define minimum integration standards that HRB vendors can build against and then engage the exchange to implement the product. These standards may leverage the IHE profiles described in this response, but may also look to deploy the XPRH IHE integration profile, the purpose of which is to support interoperability between PHR systems used by patients and the information systems used by healthcare providers.³⁸ CRISP, in coordination with the MHCC Policy Board, will also dictate minimum authentication standards and will most likely have to share the patient authentication burden to ensure the accurate delivery of patient records in HRB accounts.

Commercially available HRBs are not the only means to provide consumers with access and control over their own health information. CRISP will provide a consumer access portal into the exchange, similar to the provider portal, which will allow consumers to view their health information and exert control over how it flows through the system. Encouraging consumer engagement by offering a standardized consumer portal solution can act as a catalyst for broader adoption of consumer health management tools.

Electronic Health Records

The challenges of HIE cannot be adequately addressed without acknowledging the absolute requirement of a significant increase in the use and adoption of EHRs in Maryland. That increase will drive increasing returns to scale in terms of clinical value, as the amount of information available for exchange increases. Two of the three major components of a successful overall health IT plan for Maryland are incorporated in this response; health information exchange and consumer access through health record banks. The third component, electronic health record adoption, is touched on in this section, but will require significant work and attention from government and private sector leadership. A provider portal solution can act as a mechanism to drive adoption of more robust EHR solutions as the HIE grows and its value is realized. The concept is that less intrusive IT solutions, such as portal access to the exchange, can allow providers to participate and use external health information during patient treatment without having to deploy intensive

³⁷ Ibid
³⁸ http://wiki.ihe.net/index.php?title=PCC_TF-1/XPHR#Exchange_of_Personal_Health_Record_Content_Integration_Profile_.28XPHR.29, Accessed January, 2009.

EHR solutions locally or significantly modify clinical workflows. As the data becomes more valuable to a provider's day-to-day practice, we expect he or she will seek the ability to consume more information through increased HIE participation. At that point, transitioning to more robust solutions, such as an "EHR lite", a hosted EHR, or a locally-deployed EHR system can occur.

On a national level, increasing attention has been paid to EHR adoption over the past few months, largely as a result of the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA seeks to increase provider adoption of EHRs through Medicare and Medicaid incentive reimbursements beginning in 2011. Furthermore, Medicare penalties will be assessed to providers who have not adopted EHRs by 2015. In general, the health IT provisions in ARRA aim to move the nation toward a fully electronic and interoperable health care system. The Act also establishes programs for states to provide loans to providers for EHR adoption and grant money for state health information exchange and other health IT adoption efforts. Although the Congressional Budget Office estimates that the incentives and penalties under ARRA will result in 90% and 70% EHR adoption rates for physicians and hospitals, respectively, by 2020, the true effects of these provisions remain to be seen.

In Maryland, the state legislature took efforts to advance EHR adoption one step further with a progressive bill known as House Bill 706 (HB706). HB706 was signed into law by Governor Martin O'Malley on May 19, 2009. The bill not only aligns with federal Medicare and Medicaid incentives and penalties but also gives state agencies the authority to require state-regulated insurers to incorporate incentives and penalties into their payment structures. HB706 is the first bill in the nation to extend such payment regulations to private payers, demonstrating Maryland's commitment to health IT and making it an important state to watch nationally as 2015 draws near.

Standards

An ongoing challenge for health IT advocates and stakeholders is the use of standards. Stakeholders struggle to consistently deploy those standards that exist across organizations to ensure that effective communication can occur between information systems. Standards have been or are being developed by a multitude of standards development organizations and have numerous and frequently inconsistent applications, leading to the interoperability shortcomings of the existing infrastructure. As these standards mature and are implemented through specific frameworks the burden of interoperability should become manageable.

Message and Document Formats

Health Level 7 (HL7), Digital Imaging and Communications in Medicine (DICOM), IHE, Electronic Data Interchange X12 (EDI X12), National Council on Prescription Drug Plans (NCPDP), Standard Object Access Protocol (SOAP), electronic business Extensible Mark-up Language (ebXML), Secure Socket Layer (SSL), and Transport Layer Security (TLS) are message, transport, and integration standards and protocols that have various applications in health IT and data transfer. Some of these standards have more relevance to the early phases of the CRISP HIE than others. XML underpins the CCD document structure and is a coding language that allows human interpretable tags to be included. XML, in some instances wrapped in a SOAP protocol, is a widely used language standard and allows messages to flow between various operating platforms. HL7 has vast application as a messaging standard in healthcare yet has enough flexibility to create a lack of uniformity and inconsistent application. CRISP will certainly leverage HL7 messaging in our technology solution, and in many places use the IHE integration profiles to ensure interoperability. DICOM and NCPDP provide for messaging standards around imaging and medication information, respectively. CRISP has defined two Use Cases that will leverage these standards for the delivery of image and drug information. TLS, and upgraded version of SSLv2, is leveraged in the XDS.b integration profile (a security upgrade from XDS.a), and will be a protocol that is a critical security mechanism throughout the exchange. ANSI ASC X12 is a standard for EDI that is more applicable in healthcare to administrative transactions, however can play a role in various clinical transactions. For example, in the medication history service that CRISP is piloting, an EDI X12 270/271 (eligibility verification) transaction is used to locate prescription medication information.

“The CCD,” according to the standards bodies that developed it, “is a joint effort of HL7 and ASTM to foster interoperability of clinical data to allow physicians to send electronic medical information to other providers without loss of meaning, which will ultimately improve patient care.”³⁹ CRISP believes that the health IT industry is moving toward the CCD standard for the exchange of clinical documents, but that CCD C32 definitions do not constrain the document to a degree that creates a consistent document for exchange. Therefore, CRISP will work towards using the CCD C32 as a document standard with the recognition that further definition and constraints within that document will need to be applied. These constraints will be developed by the CRISP technology committee and approved by the board. The use of the CCD standard is built upon and reinforced by CCHIT identifying the CCD as a document standard in its 2008 certification criteria.⁴⁰

Clinical Terminology

Clinical terminology variances creates a significant challenge for HIE. We reference the importance of a nomenclature normalization service in the ‘Service Oriented Architecture’ section as it is crucial in creating a semantically interoperable HIE. CRISP believes that semantic interoperability is indeed critical, but will require a deeper technology solution assessment to understand current offerings and the ability to incorporate nomenclature normalization services into phase one of the HIE. The frequently cited example of two different proprietary systems coding a Potassium value

39 HL7 and ASTM Joint Press Release on CCD Interoperability Standards, February 2007.
40 <http://www.cchit.org/choose/index.asp> Accessed February, 2009.

as “K” in one system and “POT” in the other demonstrates the challenge at hand when considering the sheer number of possible representations across the numerous areas of clinical terminology.

Managing the numerous possible representations of clinical terminology will require translations to a singular nomenclature for various data types. LOINC, SNOMED-CT, DICOM, and RxNORM represent standards that the HIE can either require data be formatted to or translate non-standardized data into. CRISP believes that use of these standards is critical in creating a statewide HIE and will incorporate them, most likely through a nomenclature normalization service.

Integration Profiles

As referenced in other areas of our response, CRISP will deploy a HITSP-endorsed approach to HIE. HITSP has endorsed a number of IHE profiles that support basic HIE functions such as patient identity matching, document location, document retrieval, authentication, and auditing. CRISP believes that while IHE represents a practical path forward, not all integration profiles have been fully developed, and not all profiles have been deployed in other real world settings. We believe that in many cases, CRISP will undertake cutting edge work that does not have “live” examples to work from, however, we also believe that we should not use IHE as our unbending mold for the statewide HIE solution. To that end, CRISP included a number of questions in the CRISP RFI soliciting responses regarding vendor capability to produce the IHE transactions listed in the RFA document. We believe that many of the transactions are indeed critical to enabling the Use Cases CRISP will deploy. However, there are also profiles that may not be relevant to the Use Cases, or in some cases, commercially offered in the market place.

CRISP believes the following profiles are of most relevance to enabling the Use Cases described in the early phases of the HIE.

- Consistent Time
- Audit Trail Node Authentication
- Enterprise / Cross-Enterprise User Authentication
- Patient Identifier Cross-Reference
- Patient Demographic Query
- Cross-Enterprise Document Sharing
- Cross-Enterprise Document Sharing – Scanned Documents

The Basic Patient Privacy Consents integration profile is likely to be leveraged, however it, along with other profiles, will be assessed to ensure it meets the criteria defined by the HIE technical committee. CRISP will follow the work of IHE and HITSP closely, and will comment and participate when appropriate, to ensure that the HIE continues to adhere to generally-accepted and promulgated standards.

Exchange Functionality

Use Cases

CRISP defines a Use Case as a specific service that is enabled by the exchange, providing benefits to patients, providers and/or other stakeholders. CRISP will promote the development of Use Cases and “seed the market” with initial services. Ultimately, the selection and prioritization of Use Cases should be market driven – an ideal that should prove easier to follow as the HIE matures. At startup, in the absence of market feedback, CRISP will need to select the Use Cases to pursue, with the help of the Exchange Board of Advisors. Because some potentially valuable Use Cases will require cooperation among many institutions, CRISP also has a role in coordinating the efforts of disparate organizations to bring certain Use Cases to fruition.

The Use Cases below were deemed valuable early pursuits by the multi-stakeholder workgroups of the CRISP HIE planning project, which the MHCC sponsored. They are presented in a priority order, with the priority having been set by a combination of factors, as referenced in the RFA document, including: clinical value, ease of implementation, and financial sustainability. As such, the order represents our intended implementation order, as requested in the RFA. These labeled “A” are planned to start first, “B” in the second group, and so forth. However, the initial Use Cases CRISP adopts will be based on recommendations from the Exchange Board of Advisors, which will assist in the prioritization and structuring of Use Cases to be introduced in the first several years. The market reception of these services will ultimately determine when and how broadly these services are deployed.

CRISP will also encourage the introduction of new Use Cases, beyond those listed, and particularly where a commercial interest makes them viable apart from grant startup funding. As an organization accepting a certain public trust, CRISP will equally serve all hospitals, healthcare providers, and entrepreneurs. While we will ensure, in coordination with the MHCC Policy Board, that sound policy and consumer protection accompany any new service, we will allow these services to develop without discriminating against ideas and ventures from the community.

HIE Services

CRISP believes that MHCC has enumerated appropriate Use Cases in the RFA document. Our description of Initial Use Cases in our response closely parallels the Use Cases summarized in the RFA. The CCD/CCR standards, mentioned by the MHCC as a separate Use Case, are document standards that will be employed in the other Use Cases (e.g. Chart Summary Delivery), and it is therefore not specifically identified as a separate Use Case.

Group A. Medication History in the Emergency Department / Hospital

Summary

Over the past year, CRISP has been conducting a pilot project to deliver electronic medication history information to Maryland emergency departments. Due to the fact the service is already being piloted, delivery of medication history is anticipated to be chronologically the first Use Case for the standards-based HIE in Maryland. CRISP believes that medication history information can be delivered through multiple mechanisms - for example as an independent message or as part of a CCD document. In the initial rollout it will likely be sent as an independent message, with integration into a CCD a goal for the future.

The existing electronic medication history service now in pilot functions when, at the time of hospital registration, a query is sent to an HIE infrastructure and then routed to RxHub / SureScripts, which in turn queries the PBMs in the network, and returns a list of prescription medications to a printer at the hospital. The communication occurs across a secure VPN connection. The prescription medication list is derived from insurance claims information and

does not have 100% coverage of all medications a patient may be taking; some patients are not in the system and some medications may have been obtained in a manner that is not captured by PBMs. Rather, the list is an aid to the physician during the medication reconciliation interview required by JCAHO, helping to create a more accurate medication history than could otherwise be obtained. The first location is returning results for approximately 60% of patients who consent to participation. RxHub / SureScripts is currently integrating their independent networks to allow both PBM and pharmacy data to be accessed by the medication history service, likely driving up the completeness of the medication list and the percent of positive results in terms of patient coverage.

A medication history service could be purchased by a hospital independent of an HIE. However, working through the HIE will provide several advantages:

- The HIE will be able to purchase and coordinate the service at a lower cost than hospitals would receive independently.
- The HIE will be able to drive up the 'hit rate' by encouraging the participation of additional Maryland health plans, and possibly by incorporating data directly from Maryland providers into the list.
- In the long run, the HIE will be able to integrate the medication history list into a broader clinical summary document, making the information easier for physicians to consume.

Most importantly, connecting to the HIE for medication history services will be a 'foot-in-the-door' for adopting other Use Cases within Maryland hospitals.

Clinical Value

The core clinical value and the primary objective of the medication history service is to streamline the mandatory process of reconciling medications when a patient presents in a number of care settings. This process customarily begins when a caregiver asks the patient (if the patient can respond) what prescription and non-prescription medications s/he is taking. The data collected is often inaccurate, as patients are frequently forgetful and rarely know the exact names and doses of their current and recent prescriptions. At times, the first source of data is a patient's description of the color or characteristics of a certain pill without its brand or generic name. This interaction—however useful or not—is typically the first source of data. Next, the clinician might pull charts or search other hospital data or internal systems if available. Or they might even try to call a pharmacy to obtain records (assuming the pharmacy is open). Typically, all of this information is fragmented, requiring a cumbersome, time-consuming, and challenging process with highly variable results. By delivering ED providers a robust electronic medication history, the medication reconciliation process is meaningfully improved and thus care is improved.

Technical Challenge / Ease of Implementation

Implementing the electronic medication history service has a minimal level of effort from a technical perspective. Existing networks that have the ability to accept demographic information to query data sources (RxHub / SureScripts), and existing medication reconciliation workflow processes are generally supportive of additional information being injected into the process.

Timeline

The relative ease of implementation, and the fact that this service is already operating in pilot, are the reasons this Use Case is chronologically early in the list. CRISP will push for additional adoption of this service within six months of the grant award.

Finances

CRISP intends to subsidize the service for the initial pilot hospitals as a means of jumpstarting adoption (a strategy likely to be repeated for other Use Cases). The marketplace will ultimately determine the extent to which this Use Case is adopted, including the issue of whether such a service ultimately becomes part of the standard of care for a hospital. The Medication History Use Case is projected to reach sustainability before SG&A once the implementation phase is complete. Yet, the overall NPV is projected as negative. The MHCC/HSCRC grant will be necessary to subsidize the

implementation and early operation of the service. CRISP doubts the Use Case could be successfully implemented without subsidization – which is of course a strong argument for the overall startup grant approach the MHCC has championed these past several years.

Also of note, the cost of providing this service to emergency departments will be highly influenced by the cost of obtaining the data from national sources. The cost of implementation and operation are relatively small in comparison. If CRISP were able to negotiate a very favorable rate (a moderately favorable rate is already assumed), the service could be NPV positive much more quickly.

Medication History	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sources Supplying Data			1	1	1	1	1	1	1
Emergency Departments Using Service			9	19	28	38	47	47	47
Interface	1	(\$15,000)	(\$15,000)	(\$5,000)	(\$5,175)	(\$5,356)	(\$5,544)	(\$5,738)	(\$5,938)
Software Configuration	1	(\$10,000)	(\$10,000)	(\$1,000)	(\$1,035)	(\$1,071)	(\$1,109)	(\$1,148)	(\$1,188)
Transaction Fees paid to data vendor	1		(\$300,000)	(\$600,000)	(\$900,000)	(\$1,200,000)	(\$1,500,000)	(\$1,500,000)	(\$1,500,000)
Revenue (financing mechanism TBD)	47	\$35,000	\$330,000	\$660,000	\$990,000	\$1,320,000	\$1,650,000	\$1,650,000	\$1,650,000
Total Cost			(\$310,000)	(\$601,000)	(\$901,035)	(\$1,201,071)	(\$1,501,109)	(\$1,501,148)	(\$1,501,188)
Total Revenue			\$330,000	\$660,000	\$990,000	\$1,320,000	\$1,650,000	\$1,650,000	\$1,650,000
HIE Service Margin			\$20,000	\$59,000	\$88,965	\$118,929	\$148,891	\$148,852	\$148,812
NPV		\$494,635							

Consent

Under the law, the electronic medication history service requires no additional consent beyond implied consent for treatment, though the pilot service is requiring informed consent to be obtained verbally by the registrar and supported by patient education information. The pilot project has incorporated a minimal modification of emergency department registration systems to capture patient consent at the time of registration.

Other Challenges

A primary challenge of the Medication History Use Case will be the cost of obtaining data from the data provider. Depending on the magnitude of the volume discounts CRISP achieves, the cost of the service may be a limiting factor in the adoption. Other mechanisms for obtaining medication history data may need to be examined.

Group A. Lab Results Delivery

Summary

One of the most financially successful services deployed by RHIOs and HIEs around the country has been that of lab results delivery to physicians and clinics. Most of the large national laboratories (including LabCorp and Quest) already offer electronic delivery of results to ordering physicians through proprietary portals. The services offered through CRISP would include the national labs, as well as hospital and local/regional laboratories. By consolidating multiple sources to a single report, physicians will realize efficiencies by not having to access multiple portals, faxes, or mailed reports to obtain results for patients. As far as hospital labs are concerned, they are mostly utilizing paper to mail results to physicians today. By enabling electronic delivery, hospitals can reduce the administrative costs of paper and postage.

This service would simply route lab results from the processing lab to the ordering physician, along with any requested copies to other physicians. Because this is a direct “push” of data from one provider to another, there would be no need to access the EMPI or Patient Registry.

Clinical Value

While realizing tremendous administrative savings and simplifying workflow, there is no direct improvement in clinical value realized through delivery of lab results. This Use Case replaces an existing function with a more efficient one, but no new clinical value is derived. Yet, if clinicians around the state begin to use a common portal, the HIE will have successfully laid the foundation for other valuable services, which can be used even by physicians who are mostly paper based. This Use Case could serve as a foundation upon which the HIE can introduce other services.

Technical Challenge / Ease of Implementation

Because the national labs are already delivering results electronically, it will be relatively simple to re-purpose existing messages to flow into the exchange and be available to the ordering provider. The ease of implementation will likely vary widely from hospital to hospital and from local lab to local lab, based on the use of homegrown (non-standard) code sets and the level of electronic enablement present in each system. The availability of proven portal technology may also aid the implementation of this Use Case.

Timeline

This Use Case is categorized as “A”. Effective implementation planning is possible without the full exchange infrastructure. While rollout would be possible before the core exchange technology (EMPI and Patient Registry), CRISP will prioritize Use Case in front of others which have a more direct clinical impact. Initial go live is expected in the later part of 2010.

Finances

National Lab Results Delivery	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labs Supplying Data			2	2	2	2	2	2	2
Physicians Using Service			2,100	3,500	4,900	6,300	6,300	6,300	6,300
Interface	2	(\$15,000)	(\$30,000)	(\$10,000)	(\$10,350)	(\$10,712)	(\$11,087)	(\$11,475)	(\$11,877)
Software Configuration	2	(\$10,000)	(\$20,000)	(\$2,000)	(\$2,070)	(\$2,142)	(\$2,217)	(\$2,295)	(\$2,375)
Revenue (\$10/doc/mo)	7,000	\$120	\$252,000	\$420,000	\$588,000	\$756,000	\$756,000	\$756,000	\$756,000
Total Cost			(\$50,000)	(\$12,000)	(\$12,420)	(\$12,855)	(\$13,305)	(\$13,770)	(\$14,252)
Total Revenue			\$252,000	\$420,000	\$588,000	\$756,000	\$756,000	\$756,000	\$756,000
HIE Service Margin			\$202,000	\$408,000	\$575,580	\$743,145	\$742,695	\$742,230	\$741,748
NPV		\$2,721,605							
Hospital Lab Results Delivery	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labs Supplying Data			0	9	19	28	38	47	47
Physicians Using Service			0	700	2,100	3,500	4,900	6,300	6,300
Interface	47	(\$15,000)	\$0	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)	\$0
Hospital Interface Funding	47	\$0	\$0	\$141,000	\$141,000	\$141,000	\$141,000	\$141,000	\$0
Software Configuration	47	(\$20,000)	\$0	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)	\$0
Revenue (\$2/doc/mo)	7,000	\$24	\$0	\$16,800	\$50,400	\$84,000	\$117,600	\$151,200	\$151,200
Total Cost			\$0	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)	\$0
Total Revenue			\$0	\$16,800	\$50,400	\$84,000	\$117,600	\$151,200	\$151,200
HIE Service Margin			\$0	(\$171,200)	(\$137,600)	(\$104,000)	(\$70,400)	(\$36,800)	\$151,200

NPV		(\$333,078)							
Local Lab Results Delivery	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Labs Supplying Data			0	10	20	30	40	50	50
Physicians Using Service			0	700	2,100	3,500	4,900	6,300	6,300
Interface	50	(\$15,000)	\$0	(\$150,000)	(\$150,000)	(\$150,000)	(\$150,000)	(\$150,000)	\$0
Lab Interface Funding	50	\$0	\$0	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$0
Software Configuration	50	(\$20,000)	\$0	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)	\$0
Revenue (\$3/doc/mo)	7,000	\$36	\$0	\$25,200	\$75,600	\$126,000	\$176,400	\$226,800	\$226,800
Total Cost			\$0	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)	\$0
Total Revenue			\$0	\$25,200	\$75,600	\$126,000	\$176,400	\$226,800	\$226,800
HIE Service Margin			\$0	(\$174,800)	(\$124,400)	(\$74,000)	(\$23,600)	\$26,800	\$226,800
NPV		(\$188,772)							

Consent

Since information is flowing from a processing lab directly to the physician who ordered the test, we do not anticipate the need for additional patient consent in this Use Case. By altering the means of transportation of the clinical message, but not the recipient or subsequent access to the data, there should be no need to alter any existing consent forms or processes. Of course, CRISP will work under the guidance of the Exchange Board of Advisors and the MHCC convened Policy Board in this matter.

Other Challenges

Broad implementation of this Use Case is the first which will require outreach to the thousands of physicians around the state. Plans for physician outreach have been designed, and funds have been budgeted, yet the effectiveness of this outreach and thus the final penetration of the service is not entirely predictable. Further, integrating regional and hospital based labs will add to the integration effort of this Use Case. The partnership of lab providers will be pursued to aid in the outreach and adoption efforts.

Group B. Hospital Discharge Summaries to Emergency Department / Hospital

Summary

In the “Discharge Summaries to Physicians and Clinics” Use Case the recipient of information is another emergency department or hospital, removing the element of ER diversion that is present below in sharing discharge summaries among physicians and clinics. This Use Case delves into hospital-to-hospital data sharing, which the CRISP group believes to be viable but perhaps more difficult due to limited natural incentives for participation. This Use Case lends itself to alternative consumer-centric delivery models, such as health record banks. Yet, a health record bank infrastructure is not “shovel ready” for immediate implementation. The hybrid model proposed by CRISP is intended to accommodate either approach, and a number of consumer-engagement strategies can ultimately be supported.

In specific regions, such as Montgomery County, emergency departments have already expressed an interest in participating in an exchange of discharge summaries. This willingness is in part driven by the frequency with which these hospitals go on “bypass”, resulting in a repeat patient at one hospital suddenly showing up at another. In other regions, providers have already begun to coordinate, as in the case of St. Agnes, LifeBridge, and Erickson. CRISP will develop an infrastructure for this Use Case that can serve all of the state’s hospitals, but we expect to focus early implementation at the hospitals within regions where the expressed willingness and incentives to participate are highest. Successful implementations of limited scope may help drive broader adoption.

Clinical Value

The clinical value of this Use Case is the ability to inform emergency room providers of critical information that may not otherwise be available. This Use Case expands upon the value of the electronic medication history service by expanding the scope of the health information delivered to the point of care, increasing the ability for providers to quickly respond and provide care to patients who may be unable to communicate effectively or may not recall their past encounters.

Technical Challenge / Ease of Implementation

Implementation of this Use Case is quite similar to the discharge summary to physician and clinics Use Case discussed above. Key challenges include defining the structure of the document and/or developing the ability to transfer information in an unstructured format. If a hospital has already altered admission workflows to accept a medication history transaction, then implementation of this Use Case will be easier.

Even before the core technologies are implemented, CRISP might be able to leverage workflows and technologies already implemented by participants who now want to engage in the statewide effort (for example those now in use between LifeBridge and St. Agnes), making existing capabilities more broadly impactful. If such an approach is taken, our aim will be to migrate those services towards the standards-based infrastructure once it is available.

Timeline

This Use Case is categorized as “B”. Effective implementation planning will not be possible until after the core exchange technology is procured. Initial go live of this Use Case is expected in the middle of 2011.

Finances

Emergency Department/Hospital Discharge Summaries	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Hospitals/Emergency Departments Supplying Data			0	0	9	19	28	38	47
Physicians Using Service			0	0	2,100	3,500	4,900	6,300	6,300
Hospitals/Emergency Departments Using Service			0	0	14	24	33	42	42
Interface	47	(\$15,000)	\$0	\$0	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)
Hospital Interface Funding	47	\$0	\$0	\$0	\$141,000	\$141,000	\$141,000	\$141,000	\$141,000
Software Configuration	47	(\$100,000)	\$0	\$0	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)
Revenue (\$10/doc/mo)	7,000	\$120	\$0	\$0	\$252,000	\$420,000	\$588,000	\$756,000	\$756,000
Revenue (\$1000/hospital/mo)	47	\$12,000	\$0	\$0	\$169,200	\$282,000	\$394,800	\$507,600	\$507,600
Total Cost			\$0	\$0	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)
Total Revenue			\$0	\$0	\$421,200	\$702,000	\$982,800	\$1,263,600	\$1,263,600
HIE Service Margin			\$0	\$0	(\$518,800)	(\$238,000)	\$42,800	\$323,600	\$323,600
NPV		(\$214,221)							

Consent

CRISP will seek the guidance of the Exchange Board of Advisors on the particular implementation of consent for this scenario. The issues may mirror those of the medication history Use Case, since they occur in the same treatment context.

Other Challenges

As stated above, the lack of natural financial incentives for this Use Case could make broad implementation more difficult. Recent legislation in Maryland should help create stronger incentives.

Group B. Hospital Discharge Summaries to Physicians and Clinics

Summary

Delivering emergency department and hospital discharge summaries to physicians and clinics is a critical Use Case that enables the transfer of key information following an acute health event so that appropriately informed follow-up care can take place. However, not all emergency room care is for emergent situations. By supplying physicians and clinics with detailed discharge information, this Use Case will support appropriate use of emergency rooms. Clinics will be informed of patients who may not have a primary care physician, allowing for outreach efforts to be employed seeking to discourage non-emergent use of the ED and promote primary, clinic-based care when appropriate. If workflows and incentives are properly implemented, adoption of the Use Case will result in fewer readmissions – a goal which is currently receiving attention within the Maryland hospital community.

Clinical Value

The inclusion of emergency room discharge information is powerful during follow-up care to ensure an accurate understanding of the previous episode of care is conveyed to the next provider. Enabling this improvement in the continuity of care through sharing of discharge summaries is a clear example of the core clinical benefits of health information exchange.

Technical Challenge / Ease of Implementation

Implementation of this Use Case will require defining the elements and structure of a discharge summary, similar to the need to define the elements of a clinical summary. Early deployments of this Use Case may rely on unstructured documents delivered through the exchange, still delivering the clinical content, but without the ability to effectively integrate that content with other data sources. Early implementation may well occur within a narrow geographic area. Montgomery County hospitals made this Use Case a primary focus of their MCHIE planning project, so Montgomery County is a likely pilot location. Of course, the aim of CRISP will be for broad geographic adoption and structured data in a CCD format, even if early pilots include temporary compromises.

The implementation will be made easier by the financial benefit participants stand to recognize. Hospitals will want to participate if the Use Case can help them avoid readmissions, for which they are likely to pay a reimbursement penalty. Ambulatory practices and clinics will want to participate if the Use Case is likely to bring new patients their way.

Timeline

Our plan assumes that work begins immediately, and that the first pilot goes live in late 2011. The number of clinics which will participate is difficult to predict. We could even find that many primary care providers in private practice will want to connect. In the plan, adoption reaches 50% of the state's hospitals by year 4.

Finances

Assuming that hospitals and clinics have an incentive to adopt this Use Case, the fees associated with the service should be palatable. The Use Case should be NPV profitable before SG&A, with the end of year 4 the first profitable period. CRISP expects to subsidize implementation and monthly expenses in the beginning to jumpstart adoption. Thereafter, the cost of integration would be charged back to participants.

Emergency Department/Hospital Discharge Summaries	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Hospitals/Emergency Departments Supplying Data			0	0	9	19	28	38	47
Physicians Using Service			0	0	2,100	3,500	4,900	6,300	6,300
Hospitals/Emergency Departments Using Service			0	0	14	24	33	42	42
Interface	47	(\$15,000)	\$0	\$0	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)
Hospital Interface Funding	47	\$0	\$0	\$0	\$141,000	\$141,000	\$141,000	\$141,000	\$141,000
Software Configuration	47	(\$100,000)	\$0	\$0	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)
Revenue (\$10/doc/mo)	7,000	\$120	\$0	\$0	\$252,000	\$420,000	\$588,000	\$756,000	\$756,000
Revenue (\$1000/hospital/mo)	47	\$12,000	\$0	\$0	\$169,200	\$282,000	\$394,800	\$507,600	\$507,600
Total Cost			\$0	\$0	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)	(\$940,000)
Total Revenue			\$0	\$0	\$421,200	\$702,000	\$982,800	\$1,263,600	\$1,263,600
HIE Service Margin			\$0	\$0	(\$518,800)	(\$238,000)	\$42,800	\$323,600	\$323,600
NPV		(\$214,221)							

Consent

Patient consent for this Use Case is not explicitly required for each encounter, since consent is implicit for treatment purposes. However, as in other Use Cases, this does obviate the need for robust patient education, and informed consent should still be pursued. CRISP will seek the guidance of the Exchange Board of Advisors on the particular implementation of consent for this scenario.

Other Challenges

The diverse workflows and IT infrastructure of the state's many clinics will be an obstacle to deploying this Use Case in a way that consistently results in improved patient follow up. Paper based information delivery may be an initial means of communication, in the absence of a Clinical Messaging infrastructure (which is also planned, but may not precede initial implementation of this Use Case).

Group C. Chart Summary to Emergency Department / Hospital

Summary

Chart summaries provide a concise but holistic view of an individual's overall healthcare experience. When it is known to be reliable and complete, a chart summary is the most efficient means for a clinician to quickly understand a patient's medical history. A chart summary presented as structured data in a CCD format could be an ideal way to populate EHR systems of the receiving provider with important clinical history.

The workgroups felt that the term clinical summary is relatively broad without an existing and widely understood definition, and thus preferred the term "chart summary". However, the group agreed that a summary of clinical information should contain demographics (name, date of birth, address, sex), medications, allergies, conditions/problems and results when available, expanding to past hospitalizations and past surgeries where possible. The chart summary should be contained in a structured document (CCD) format. Delivery can be done on-demand through a pull, or more likely, delivery can be automatically triggered by an ED or hospital admission.

Potential sources of information for a chart summary include electronic health record systems from participating providers, ancillary service provider systems, personal electronic health records or health record banks, and claims systems for payers. The CRISP model will seek to integrate all sources available to the exchange, and would be sufficiently flexible to permit the addition of new data sources as they become available.

Chart summaries are most valuable when the patient has the ability to view and annotate the data. Because privacy concerns can be more intense surrounding a comprehensive health summary, a chart summary is best handled when the patient has clear ownership and the ability to control who sees it. For these reasons, CRISP believes a health record bank which delivers information through the exchange is the ideal mechanism to manage chart summaries.

Clinical Value

The primary advantage to emergency departments and hospitals of the chart summary is the ability to quickly understand a patient's medical history. Like the medication history service described above, the purpose of the chart summary is not to replace conversation with the patient, but rather to provide a reference source for the conversation that may help to avoid accidental or deliberate miscommunication or forgetfulness on the patient's part.

Not only would caregivers get a view of conditions currently affecting the patient, but the chart summary may give the provider indications of how long conditions have affected the patient, how effectively they are being treated, and perhaps even clues regarding the patient's compliance with treatment regimens. All of this information may assist the provider in diagnosis and treatment of current symptoms and may help to prevent medical errors. For example, something in the patient's chart summary may raise concerns about a planned course of treatment and prompt more examination.

Technical Challenge / Ease of Implementation

Delivery of chart summary data through the HIE will be relatively easy, especially if the chart summary conforms to a CCD/CCR standard. However, the original creation of complete and accurate chart summaries is very difficult to accomplish. In some cases, primary care providers or other providers who use an EHR will be able to produce a chart summary which can be published to the exchange. Examples of this approach are already in use today, such as by Erickson Retirement Communities.

However, the data from just one provider is not always complete and accurate. Ideally, data could be consolidated from disparate systems into a single chart summary which the patient could review. Some patients maintain a consolidated chart summary for themselves using a PHR which they update manually. But very few examples of an automated approach to chart summaries are in use today. CRISP intends to encourage the development of health record bank capability which will fill this gap.

Implementation of chart summaries could also involve a significant education and training effort for the providers who will receive the information. Good design should render interpretation of the presented information largely intuitive, but care must be taken to ensure that providers understand the limitations of the presented information, lest errors of omission undermine the clinical value of the chart summary.

Timeline

CRISP expects this "C" category service to be piloted in the middle of 2012. Rollout will undoubtedly be incremental, since so few providers currently produce chart summaries which can be delivered. The full blown and frequent use of chart summaries is not envisioned to occur until adoption of EHRs begins to accelerate. Even then, chart summaries will probably only be created in great number if their production is made part of a "meaningful use" requirement.

Finances

Clinical Summary to Emergency Departments	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Formats Supplying Data			0	0	1	1	1	1	1
Emergency Departments Using Service			0	0	14	24	33	42	42
Interface	1	(\$15,000)	\$0	\$0	(\$15,000)	(\$5,000)	(\$5,175)	(\$5,356)	(\$5,544)
Software Configuration	1	(\$100,000)	\$0	\$0	(\$100,000)	(\$10,000)	(\$10,350)	(\$10,712)	(\$11,087)

Revenue (\$2000/ED/mo)	47	\$24,000	\$0	\$0	\$338,400	\$564,000	\$789,600	\$1,015,200	\$1,015,200
Total Cost			\$0	\$0	(\$115,000)	(\$15,000)	(\$15,525)	(\$16,068)	(\$16,631)
Total Revenue			\$0	\$0	\$338,400	\$564,000	\$789,600	\$1,015,200	\$1,015,200
HIE Service Margin			\$0	\$0	\$223,400	\$549,000	\$774,075	\$999,132	\$998,569
NPV		\$2,540,837							

Consent

The chart summaries to emergency departments and hospitals Use Case is similar to medication history Use Case from a consent perspective. The chart summary service requires, by law, no additional consent beyond implied consent for treatment, though CRISP suggests requiring informed consent to be obtained verbally by the registrar and supported by patient education information, or a more stringent process should the participant deem it appropriate. Assuming chart summaries are implemented after or at the same time as the medication history service, the minimal modification of emergency department registration systems to capture patient consent at the time of registration implemented for medication history should also support the necessary consent for chart summaries.

As the number of hospitals with the technical capability to pull a chart summary increases, even though inappropriate access will be prohibited by hospital policy, the potential for privacy breaches will increase. In general, the more complete the data available, and the greater the number of nodes, the larger the privacy risk to an individual. For the long run, and especially as the delivery of chart summaries progresses beyond emergency departments, CRISP believes robust and granular consent control should be provided to patients through health record banks.

Other Challenges

The full value of this Use Case will only be achieved if commercially viable health record banks can provide the functionality of record consolidation, patient review and annotation, and patient control and ownership. CRISP will work to encourage the development of such capability.

Group C. Chart Summary to Physicians and Clinics

Summary

This service is identical to the “Chart Summary to Emergency Department / Hospital” Use Case described above, except that the delivery is to ambulatory practices.

Clinical Value

As stated before, a chart summary is the most efficient means to quickly understand a patient’s medical history. Physicians may use the chart summary to identify gaps in recommended preventive care, or care for maintenance of a chronic condition, and thus enhance their overall care management efforts.

Technical Challenges / Ease of Implementation

As is the case when delivering chart summaries to EDs, the creation of chart summaries is the more difficult side of the equation than delivery. However, delivery to the thousands of physicians and clinics in the state will be more difficult than connecting 47 hospitals. This service will be easier to implement if physicians already have reasons to engage with the exchange. A portal for results delivery could be a precursor to this Use Case.

Timeline

Similar to the timeline in the Use Case above, CRISP expects this “C” category service to be piloted in the middle of 2012. Rollout will undoubtedly be incremental, since so few providers currently produce chart summaries which can be delivered.

Finances

Clinical Summary to Physicians/Clinics	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Formats Supplying Data			0	0	1	1	1	1	1
Physicians Using Service			0	0	700	2,100	3,500	4,900	6,300
Interface	1	(\$15,000)	\$0	\$0	(\$15,000)	(\$5,000)	(\$5,175)	(\$5,356)	(\$5,544)
Software Configuration	1	(\$100,000)	\$0	\$0	(\$100,000)	(\$10,000)	(\$10,350)	(\$10,712)	(\$11,087)
Revenue (\$10/doc/mo)	7,000	\$120	\$0	\$0	\$84,000	\$252,000	\$420,000	\$588,000	\$756,000
Total Cost			\$0	\$0	(\$115,000)	(\$15,000)	(\$15,525)	(\$16,068)	(\$16,631)
Total Revenue			\$0	\$0	\$84,000	\$252,000	\$420,000	\$588,000	\$756,000
HIE Service Margin			\$0	\$0	(\$31,000)	\$237,000	\$404,475	\$571,932	\$739,369
NPV		\$1,321,301							

Consent

As stated earlier, privacy concerns are intensified the more complete the available information and the greater the number of nodes on the network. Chart summaries will be more complete and sensitive than just a single test result or document. And physician access could number into the thousands. Privacy will be best ensured through patient ownership of the chart summary, and by patient control of access through health record bank functionality.

Other Challenges

The full value of this Use Case will only be achieved if commercially viable health record banks can provide the functionality of record consolidation, patient review and annotation, and patient control and ownership. CRISP will work to encourage the development of such capability.

Group C. Radiology Reports Delivery

Summary

The CRISP planning process found that the delivery of radiology reports could be immensely valuable. This finding contradicted an initial feeling among workgroup members that radiology reports would not be valuable, partly based in the underlying fact that imaging is a profit center for most institutions who do it—and reducing the need for images would be detrimental to that revenue stream. Instead, the workgroup concluded that revenue from radiology is not at risk from report sharing because many images would be re-taken anyway—generally providers will want to ensure that the health issues requiring an image had not deteriorated or otherwise changed since the original image by reviewing the report. The services offered through CRISP would include connectivity with the national radiology centers as well as hospital and local/regional centers.

Clinical Value

The clinical value of sharing radiology results is the ability to benchmark against prior images and report and assess the progression of any particular health issue. As the exchange grows and matures, functionality allowing for more rapid interpretations of historical radiology report will likely become available, increasing the overall value of this particular Use Case.

Technical Challenges / Ease of Implementation

This Use Case included varying levels of implementation challenges dependent upon the degree of integration and the pursuit of structured data. For example, the delivery of an unstructured text radiology report as a document through the exchange does not present as many implementation challenges as exchanging radiology images or structured results data. The benefit of this reality is that this Use Case can be an early entrant to the HIE and provide near term clinical value.

Timeline

This Use Case is part of the “Group C” services with an expected roll-out timeframe of late 2012 / early 2013. The radiology Use Case is similar to labs in that there are national, regional, and hospital imaging centers to integrate. CRISP will begin with the national imaging centers and move towards the regional and hospital based labs.

Finances

National Radiology Results Delivery	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Radiology Centers Supplying Data			0	2	2	2	2	2	2
Physicians Using Service			0	2,100	3,500	4,900	6,300	6,300	6,300
Hospitals Using Service			0	14	24	33	42	42	42
Interface	2	(\$15,000)	\$0	(\$30,000)	(\$10,000)	(\$10,350)	(\$10,712)	(\$11,087)	(\$11,475)
Software Configuration	2	(\$10,000)	\$0	(\$20,000)	(\$2,000)	(\$2,070)	(\$2,142)	(\$2,217)	(\$2,295)
Revenue (\$5/doc/mo)	7,000	\$60	\$0	\$126,000	\$210,000	\$294,000	\$378,000	\$378,000	\$378,000
Revenue (\$1000/hospital/mo)	47	\$12,000	\$0	\$169,200	\$282,000	\$394,800	\$507,600	\$507,600	\$507,600
Total Cost			\$0	(\$50,000)	(\$12,000)	(\$12,420)	(\$12,855)	(\$13,305)	(\$13,770)
Total Revenue			\$0	\$295,200	\$492,000	\$688,800	\$885,600	\$885,600	\$885,600
HIE Service Margin			\$0	\$247,316	\$483,526	\$681,315	\$879,090	\$878,640	\$878,174
NPV		\$2,778,025							
Hospital Radiology Results Delivery	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Radiology Centers Supplying Data			0	0	9	19	28	38	47
Physicians Using Service			0	0	700	2,100	3,500	4,900	6,300
Hospitals Using Service			0	0	5	14	24	33	42
Interface	47	(\$15,000)	\$0	\$0	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)	(\$141,000)
Hospital Interface Funding	47	\$0	\$0	\$0	\$141,000	\$141,000	\$141,000	\$141,000	\$141,000
Software Configuration	47	(\$20,000)	\$0	\$0	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)
Revenue (\$1/doc/mo)	7,000	\$12	\$0	\$0	\$8,400	\$25,200	\$42,000	\$58,800	\$75,600
Revenue (\$350/hospital/mo)	47	\$4,200	\$0	\$0	\$19,740	\$59,220	\$98,700	\$138,180	\$177,660
Total Cost			\$0	\$0	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)	(\$188,000)
Total Revenue			\$0	\$0	\$28,140	\$84,420	\$140,700	\$196,980	\$253,260
HIE Service Margin			\$0	\$0	(\$159,860)	(\$103,580)	(\$47,300)	\$8,980	\$65,260
NPV		(\$219,813)							
Local Radiology Results Delivery	Number	Unit Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Radiology Centers Supplying Data			0	0	10	20	30	40	50
Physicians Using Service			0	0	700	2,100	3,500	4,900	6,300
Hospitals Using Service			0	0	5	14	24	33	42
Interface	50	(\$15,000)	\$0	\$0	(\$150,000)	(\$150,000)	(\$150,000)	(\$150,000)	(\$150,000)
Lab Interface Funding	50	\$0	\$0	\$0	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
Software Configuration	50	(\$20,000)	\$0	\$0	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)
Revenue (\$2/doc/mo)	7,000	\$24	\$0	\$0	\$16,800	\$50,400	\$84,000	\$117,600	\$151,200
Revenue (\$650/hospital/mo)	47	\$7,800	\$0	\$0	\$36,660	\$109,980	\$183,300	\$256,620	\$329,940
Total Cost			\$0	\$0	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)	(\$200,000)
Total Revenue			\$0	\$0	\$53,460	\$160,380	\$267,300	\$374,220	\$481,140
HIE Service Margin			\$0	\$0	(\$146,540)	(\$39,620)	\$67,300	\$174,220	\$281,140
NPV		\$178,162							

Consent

Patient consent for this Use Case is not explicitly required for each encounter since consent is implicit for treatment purposes. However, as in other Use Cases, this does not make robust patient education unnecessary and informed consent should still be pursued.

Other Challenges

Broad implementation of this Use Case will require outreach to the thousands of physicians around the state. Plans for physician outreach have been designed, and funds have been budgeted, yet the effectiveness of this outreach and thus the final penetration of the service is not entirely predictable. Further, integrating regional and hospital based imaging centers will add to the integration effort of this Use Case. The partnership of imaging providers will be pursued to aid in the outreach and adoption efforts.

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Exchange Participants

The CRISP strategy for connecting all phase one and phase two participants (as described in the RFA) is primarily driven by the Use Case section above. CRISP's Use Cases were developed by considering the data provider, the data consumer, the health information which is to be transferred, and the method in which it is transferred. The RFA correctly notes that factors affecting a participant's ability or willingness to connect to the HIE include technical capability, market conditions, and overall interest in and perceived value of the HIE. However, additional criteria must be taken into account in planning for participant inclusion in the exchange.

Various Use Cases will require different criteria for connecting participants. For example, the "medication history to the emergency department" Use Case can operate largely independent of geographic considerations. It is true that RxHub/SureScripts coverage (i.e. potential "hit rate") may vary throughout the state; however, the Use Case is not dependent on defined medical trading areas or local hospital/physician/patient relationships. What this means is that because the RxHub/SureScripts' network is broad and growing, local data sources to supply health information (i.e. medication history) for local consumers is not necessary. The lab delivery Use Case is similar in that the national laboratories (Quest and LabCorp) constitute a majority of labs, therefore offer an opportunity to engage a geographically diverse set of participants. By integrating the national labs with the HIE, participants anywhere in the state who connect with the HIE can begin to realize immediate value. CRISP can then begin the process of bringing regional and local labs online to add to the volume of labs flowing through the exchange. This strategy also engages more participants earlier in the life of the exchange both enhancing the diversity of ideas available to the exchange and creating early education and communication opportunities with participants who will ultimately expand their connectivity to the exchange to enable subsequent Use Cases.

While the above two Use Cases support geographic diversity and connect many phase one participants such as pharmacies, PBMs, and labs with physicians and hospitals as well as add to CRISP's ability to drive towards a broader exchange more rapidly, we have identified other equally important Use Cases geared towards hospital emergency departments and clinics (Federally Qualified Health Clinics and others). The "discharge summary from the emergency department to the physician / clinic" Use Case connects two critically important trading partners, EDs and clinics, partially addressing the challenges of ED overcrowding and support information exchange during ED diversion situations.

The CRISP strategy for Use Case deployments does not pursue full deployment of a single Use Case to all potential participants prior to rolling-out subsequent Use Cases. CRISP intends to pursue medication history as an initial Use Case, however while that Use Case is being roll-out, work to begin the roll-out of subsequent Use Cases connecting phase one, and transitioning into phase two participants will occur. To achieve a meaningful and robust HIE, CRISP will pursue parallel implementation tracks with respect to Use Cases and the participants that benefit from them.

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Analytics / Reporting

Public Health, Care Management and Quality Improvement

The public health opportunities associated with HIE are unarguably immense. Databases of anonymized health information can also create powerful quality improvement initiatives aimed at identifying best practices and defining evidenced based practices and care management plans. The associated privacy concern is of comparable significance.

CRISP believes it is appropriate and necessary to define the meaning of the three classifications of health information (identified, de-identified or anonymized) to ensure a consistent understanding that can be proliferated as the HIE develops. Specific requirements exist for providers to provide files with identified health information, meaning health information that includes individually identifiable health data such as name, address, date of birth, etc., when specific diseases or illnesses are encountered. However there are public health needs that do not include the immediate need, or in many cases, any need to trace back to a particular individual. In those cases, de-identified data or anonymized data may be indicated. De-identified data is health information that has been stripped of any individually identifiable health information, but that has been tagged with a number so that re-identification is possible if necessary. Anonymizing data implies that all identifying information is stripped and no tag is assigned, thereby eliminating the possibility of tracing the information back to a specific individual. CRISP will ensure these definitions are discussed, modified if necessary, and adopted by the HIE governance structure.

Many CRISP members, and many potential HIE participants, are already required to submit multiple files for secondary uses by public health officials for monitoring and reporting purposes. The CRISP HIE can serve as a conduit to facilitate this existing reporting requirement, easing the burden on the provider community. However, the standards (in the non-technical sense) by which health information used for these purposes either remains identified, is de-identified, or is anonymized must be defined clearly, communicated accurately, and understood widely.

Other Secondary Use Opportunities

CRISP believes that enabling secondary uses of the HIE is of clear societal benefit and of benefit to various local, state, and national public health agencies for the purposes of early identification of communicable diseases and acute or long-term population health threats. The communication between the appropriate parties during such public health events, as well as on-going and real-time monitoring of public health threats, are vital functions of a mature HIE infrastructure. A mechanism for collecting and analyzing health data from an HIE as well as other health data sources across the country; so that public-health professionals can in turn analyze and respond to that data in real-time, will significantly improve the responsiveness and efficacy of public-health risk remediation and response.⁴¹ A recent real-world example that underscores the value of this kind of tool is the “swine flu” outbreak that has caused global concern and reaction. CRISP believes that the future state HIE will enable functionality that allows for both static and custom monitoring of specific disease markers.

Although there is great potential benefit of secondary data uses, sound policy development, enabled through the MHCC Policy Board, and consumer education regarding the purposes of using health information and how it is protected is critical because of the large risk of misunderstanding or loss of consumer trust if the public determines that secondary uses put privacy and security at risk. CRISP will work closely with the Policy Board to ensure these policies are developed and acted upon appropriately.

Approval Process for Access to Data for Secondary Uses

The opportunities and issues described above are accompanied by an equally important responsibility to ensure that patients can be confident that their health information is being protected through sophisticated security technologies and stringent policies. However, to enable the broader public health, care management, bio-surveillance opportunities,

⁴¹ Buehler, et al. “Framework for Evaluating Public Health Surveillance Systems for Early Detection of Outbreaks” CDC, May, 2004.

procedures must be in place to approve access to data for secondary uses. These procedures will certainly vary depending on the requesting entity and the request use of the data, but will be made at the highest levels of the HIE, including the CRISP Board of Advisors, the CRISP Board of Directors, and the MHCC Policy Board.

Conclusion

CRISP believes it is uniquely positioned to successfully implement a statewide health information exchange in Maryland. CRISP's vision for statewide health information exchange is first and foremost grounded in the belief that HIE will improve the health and wellness of Maryland's citizens while enhancing the efficiency of care delivery. CRISP believes that a hybrid technology architecture, use of nationally recognized standards and best practices, deployment of robust privacy and security practices, adequate education and outreach efforts, and a focus on allowing consumers to access their health data through personal health records will enable the overarching strategy that will lead to our collective success in Maryland. In the future, CRISP believes the benefits and opportunities associated with the HIE will grow, leading to improved public health surveillance and more efficient public health research opportunities.

CRISP's response incorporates the best thinking and cooperation of a wide—and, we believe, unrivaled—range of stakeholders in the Maryland healthcare community. CRISP is eager to work together internally, with new participants, and with our state partners to markedly improve the health of Maryland's citizens and to build a better future state of health care in Maryland that can be used as a model throughout the country. The HIE-enable future is a bright one, and the state of Maryland is well-positioned to be a leader.

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Appendices

RFA Acknowledgements

CRISP understands and acknowledges the provisions for Renewal stating that the RFA award is for a three year period and may be renewed or rebid at the discretion of the Commissions.

CRISP understands and acknowledges the provisions for termination stating that the RFA may be terminated at any time and/or for any reason at the discretion of the commissions.

CRISP certifies that, to the best of our knowledge and belief the group participants are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any State or Federal agency.

MHCC Addendum 3 Response

Infrastructure Security and Penetration Testing

Regardless of the infrastructure location, network security requirements must adhere to standards consistent, or exceeding, the standards of the largest participant organizations in the HIE, such as those of the largest health systems in Maryland. To ensure on-going compliance with network security requirements, CRISP will, on a recurring basis, contract for independent auditing of HIE system security. The core infrastructure components can technically be hosted at any data center meeting the requirements of system availability, network security, cost and a number of other factors. However, CRISP will deploy the core infrastructure components within Maryland, regardless of the technology vendor's geographic locations.

The consequences of security breaches were recently realized in a highly visible attack hacking into a Virginia state website which was used by pharmacists to track prescription drug abuse. The records of over 8 million patients were stolen and the backup files deleted. While the Virginia breach received widespread attention, it is certainly not the only instance of data security issues. System security is compromised by both external hacking threats as well as inappropriate internal use by those who have been authorized for other uses. Health system information security personnel involved in CRISP have observed that the vast majority of breaches occur due to inappropriate use, but that certainly does not negate the threat of external hacking attempts. CRISP will leverage the expertise of our members and partners and deploy best practices to ensure the highest level of security and scrutiny for the Maryland HIE.

MHCC Addendum 4 Response

Addendum for Regional Extension Centers

The 6/3/09 RFA Addendum asks respondents to describe their readiness to apply for Regional Extension Center (REC) funding from ONC. The Addendum states that the recipient of the MHCC/HSCRC award will be required to apply for this second grant.

As noted in the RFA Addendum, ONC has not published final rules or eligibility requirements for the extension centers. Since ONC is still receiving comments on their proposed approach, the program could change and many details are simply unknown. Therefore, the CRISP response to the RFA Addendum must be based on certain assumptions about the REC requirements. Our assessment of readiness on the following pages is also tempered by several potential concerns and caveats at the end, which exist in part because of the draft nature of the ONC program.

An REC and HIE are Related Activities

In assessing CRISP readiness to apply for ONC funding, we begin by addressing more fundamentally the question of whether the extension center effort is an appropriate expansion of scope for CRISP.

The CRISP mission statement, adopted by the Board of Directors, states:

Our mission is to advance the health and wellness of Marylanders by deploying health information technology solutions adopted through cooperation and collaboration. We will enable the Maryland healthcare community to appropriately and securely share data, facilitate and integrate care, create efficiencies, and improve outcomes.

The ONC suggests the mission of an REC is to, “Encourage adoption of electronic health records by clinicians and hospitals.” This mission is, at least on the surface before actual REC requirements are fleshed out, compatible with the CRISP mission of deploying health information technology solutions which can advance health and wellness.

The CRISP vision statement, also adopted by the Board of Directors, states:

Our vision is to realize measurable improvement in the health and wellness of Marylanders through the adoption and use of health information technology and the effective support of and cooperation with healthcare providers and citizens of our state.

The ONC document suggests the intended activity of an REC will be to, “Assist clinicians and hospitals to become meaningful users of electronic health records.” Since being of support to the healthcare providers of our state is central to the CRISP vision, the activity specified by ONC also appears to be compatible with the CRISP aims at a high level.

Beyond the formal statements of the CRISP Board and the ONC draft plans, the health IT architecture towards which CRISP is working also appears to be compatible with the REC purpose. The CRISP team imagines the broader challenge of connected healthcare as consisting of three components, all of which are necessary for the whole to function efficiently, as in the visual of a three legged stool.

The three legs are:

1. EMR adoption by physicians and hospitals
2. Health Information Exchange
3. Personal Health Records controlled by patients

The CRISP proposal to MHCC and HSCRC is focused on leg #2. Yet, we know that #1 and #3 are necessary if an HIE is going to be impactful for the improvement of public health. A Regional Extension Center is concerned with leg #1 of the system. Leg #1 being important to the success of CRISP’s other projects, one can conclude that an REC will do work that is within CRISP’s area of concern.

CRISP Qualifications

Reading the ONC draft rules, CRISP believes that our organizational structure fits with that which the Federal REC planners have in mind. The following statements in the ONC document lead us to this conclusion:

- According to the applicant criteria section, “Regional centers shall be affiliated with any United States-based nonprofit organization, or group thereof.” CRISP is a nonprofit organization, as described in the main RFA response.
- Applicants must be able to, “Demonstrate the capacity to facilitate and support cooperation among local providers, health systems, communities, and health information exchanges.” This capability is

a core strength of CRISP, as described in the main RFA response.

- An REC is intended to enable, “broad participation of individuals from industry, universities, and State governments.” The CRISP membership is affiliated with major academic institutions, we have had participants from some of the state’s foremost industry leaders, and we expect to be working closely with our state government in the build out of the HIE.
- An REC should achieve, “participation, to the extent practicable, in health information exchanges.” No elaboration is required when saying that CRISP would ‘have this one covered’.
- The ONC draft criteria state, “We propose to give preference to proposed regional center organizational plans and implementation strategies incorporating multi-stakeholder collaborations that leverage local resources.” CRISP would fit the preferred structure quite well. We are already incorporated as a multi-stakeholder organization, and we have a demonstrated commitment to using local resources. Our leadership is Maryland based, our members are Maryland corporations, and our current consulting partners are all Maryland based firms.
- The ONC would apparently like to make the grants as soon as possible. They state that, “Applicants well prepared to provide robust extension services will likely need at least two months to provide high quality proposals. It is expected, however, that other potential applicants will need more time to prepare proposals.” As a result of the federal government’s assumptions about general applicant readiness, combined with its desire to move quickly, ONC expects to award grants in perhaps four waves. Because CRISP already has a multi-stakeholder governance infrastructure in place, with officers, bylaws, consulting partners, and sound financial footing (assuming the MHCC/HSCRC decision goes favorably), CRISP believes we are well prepared to submit a solid application as soon as ONC is ready for the first wave. We note that our submission of this RFA response to the MHCC/HSCRC was completed in less than the two months ONC believes will be minimally required.

In addition to these criteria, which demonstrate that CRISP could be a strong applicant for ONC funding, we believe our organization brings tremendous subject matter expertise to the ONC envisioned effort. The CRISP leadership team has collectively overseen the implementation of EMRs to physicians numbering in the thousands.

Concerns

Although the high level outline of the Regional Extension Centers appears to fit well with CRISP, we do hold four concerns, which we believe should be shared with MHCC/HSCRC. The CRISP Board has had limited ability to discuss and dissect these concerns, due to the relative short period of time given to respond to the Addendum.

First, the CRISP Board has approved as a guiding principle that CRISP will, “Create opportunities to cooperate even while participants still compete in other ways.” It is a core part of the CRISP purpose that we are creating ‘safe’ opportunities for organizations which may be competitors to work together on narrowly defined areas. We are concerned that an REC could violate this principle, and that CRISP could even find itself competing with its members. CRISP would not want to jeopardize HIE cooperation and effectiveness through an unwise expansion, consequently, CRISP would need to craft an application to ONC in a way that did not cause competitive problems.

The second concern, related to the first, is that CRISP would not want to slow the good work that is already being done by some hospital participants to promote EMR adoption. With STARK law exemptions available, EMR promotion by a regional hospital can sometimes make business sense. If an REC had the potential to undermine this work by the hospitals, CRISP would be wary of the impact on the hospitals’ appetite to continue EMR promotion. This second concern should also be shared by the state and ONC, as EMR adoption is the larger goal, and RECs are just one means to that end. CRISP would seek to design any REC program so that it was additive to the efforts of hospitals to spur EMR adoption.

Our third concern is to stay true to our guiding principle, “Begin with a manageable scope and remain incremental.” Establishment of an REC could dilute the focus of an organization which must be very prepared to conduct the work of

HIE build out. It is certainly possible to do two related and important things at once, but CRISP would want to be sure that our approach lend itself to success on both endeavors.

Our fourth and final concern is that CRISP needs to be careful about committing to something that is not yet finalized. Were the program proposed by ONC to change significantly after the comment period, for instance in a way that would jeopardize our 501(c)3 application, the CRISP Board would need the latitude to forego an application.

Conclusion

On the whole, CRISP recognizes the advantages (efficiency, coordination, speedy application) of having a single multi-stakeholder group pursuing both the HIE and the REC. In our judgment, based on information currently available, CRISP would be very well positioned for a successful application to ONC. It is our intention to work with the MHCC/HSCRC to ensure that this application can be made in a way which puts Maryland in the best possible position to win funding, and which addresses our stated concerns, making Maryland's extension center a win for all its providers and ultimately its patients.

Curricula Vitae

Catherine Szenczy – MedStar

As MedStar Health's Senior Vice President and Chief Information Officer (CIO), Catherine Szenczy oversees information technology, information systems and clinical informatics across the system. Szenczy has more than 30 years of experience in healthcare information systems, and has served as a CIO for the past 16 years in both academic settings and integrated delivery systems.

Szenczy held CIO positions at St. Francis Care in Hartford, Conn., SUNY Health Science Center in Syracuse, New York, and University Hospital at Stony Brook, Stony Brook, New York. She also held positions within IS at Long Island Jewish Medical Center, Crouse Irving Memorial Hospital and St. Joseph's Hospital.

She has published articles in the Journal of Health Information Management, lectured on health information technology, and served on the boards of several non-profit organizations.

Szenczy received her B.A. in business management at State University of New York Empire State College, and earned her master's degree in human resources administration and labor relations at State University of New York at Stony Brook.

David Horrocks – Erickson Retirement Communities, LLC

David Horrocks is Senior Vice President for EHR Initiatives in the Developing Enterprises division of Erickson Retirement Communities. As such, David is responsible for the organization's several startup ventures seeking to promote electronic medical records and health information exchange. David is also serving at Retirement Living TV, a startup television network for Seniors currently in 30MM homes, where he is responsible for IT, HR, business process improvement, and the network's web presence.

David previously served four years as Chief Information Officer for Erickson Retirement Communities, during which time he led the effort to deploy Centricity EHR to all of Erickson's primary care providers. He subsequently extended electronic medical records to Erickson's eight Skilled Nursing facilities and Rehab departments. David spent much of 2006 in a management rotation as the Associate Executive Director of Charlestown Community in Baltimore, which is home to 2,500 seniors.

Prior to joining Erickson, David was with Visalign, an IT consulting firm, where he focused on infrastructure technology and economic analysis of IT projects. He also spent five years as a technologist and department manager for AbiliTech, a

nonprofit company providing technology services to people with disabilities. David holds a B.S. in Engineering from the University of Pennsylvania and an M.B.A. from the Wharton School of Business. He and his wife Amy live in Maryland and are raising six children.

Dr. John Parrish – The Erickson Foundation

John M. Parrish, Ph.D., M.B.A., C.N.P.S., is the Executive Director of The Erickson Foundation, a private operating foundation that engages in research as well as philanthropy. The Erickson Foundation was established in 1998 by John C. Erickson and his family. John C. Erickson is the Founder and Chairman of Erickson Retirement Communities, LLC. Under John's leadership, The Erickson Foundation invests in innovative research and development projects, shares research findings and their implications for evidenced-based practice, and actively enables local adoption, or adaptation, of demonstrated results. In alignment with current best practices in vital aging, The Erickson Foundation pursues the following strategic priorities: 1. Understanding the strengths, capacities and preferences, as well as needs, of older adults who seek an active lifestyle in senior living communities; 2. Encouraging healthy choice-making by these adults and their families, thereby striving to preserve, possibly enhance, the wellness of mature adults while extending their health span. Original studies have been completed, or are underway, in programmatic lines of inquiry including but not limited to: longitudinal changes in health and social status, utilization of health services, and choice-making; longitudinal changes in wellness and correlates of successful aging among adults systematically screened for wellness; falls and fractures risk reduction via screening, education and referral; benefits of walking; bone health screening; ergonomics in long-term care settings; and neurobics for brain health. The Erickson Foundation is demonstrating the value of a core research laboratory and resource center positioned in a senior living community. Recently, The Erickson Foundation has funded the development of the Erickson School of Aging Studies at the University of Maryland, Baltimore County. Prior to serving as Executive Director of The Erickson Foundation, John M. Parrish held faculty appointments at the The Johns Hopkins University School of Medicine, The University of Pennsylvania School of Medicine, and The University of Maryland School of Medicine.

Dr. Mark Kelemen - UMMS

Mark Kelemen MD, MBA, MSc. joined the University of Maryland Medical System as its first CMIO in 2007 to facilitate the successful adoption of leading edge clinical information technology. He most recently served as the director of Clinical Cardiology at the University of Maryland Medical Center and remains active on the medical staff. He is an Associate Professor of Medicine at the University of Maryland School of Medicine.

Dr. Kelemen grew up in Columbia, Md., and attended Brown University and the Johns Hopkins School of Medicine. He trained in internal medicine at Duke University and in cardiology at the Johns Hopkins Hospital. He received a Master of Science degree from the Johns Hopkins School of Public Health in Clinical Investigation and an MBA in Medical Services Management, also from Johns Hopkins. He served on the faculty of the Johns Hopkins School of Medicine for seven years before joining the University of Maryland in 2002. He has written more than 30 scientific articles, has served on state commissions on cardiovascular care and has helped develop national guidelines for in-hospital management of hyperglycemia. He is a fellow of the American College of Cardiology.

Dr. Matt Narrett – Erickson Retirement Communities, LLC

Dr. Narrett is the Executive Vice President and Chief Medical Officer for Erickson Retirement Communities. He is responsible for directing the provision of medical care at all Erickson communities. The Medical Centers that Dr. Narrett directs at Erickson communities are recognized as America's leading geriatric health care facilities. Prior to his current position, he served as Erickson's Vice President and Regional Medical Director, as well as Medical Director for Charlestown. Before joining Erickson, he was in private practice in Derry, New Hampshire, where he served as director of medical quality assurance.

Dr. Narrett holds a B.S. in molecular biochemistry and biophysics; he graduated summa cum laude from Yale University.

He received his medical degree from Harvard Medical School, Harvard-M.I.T. Division of Health Sciences and Technology. He completed his internship and residency at Beth Israel Hospital in Boston. He is board certified in internal medicine and holds a certificate of added qualifications in geriatric medicine. Dr. Narrett is a member of the American College of Physicians and the American Geriatrics Society.

Dr. Peter Basch – MedStar

Dr. Basch practices internal medicine in Washington, DC, and is the Medical Director for eHealth at MedStar Health. He is a frequent speaker, author, and expert panelist on such topics as EHRs, interconnectivity, the transformation of healthcare through HIT, and the necessity of creating a sustainable business case for information management and quality. Dr. Basch is currently chairman of the Maryland Task Force on EHRs and co-chair of the Physicians' EHR Coalition.

Dr. Basch is a board member of the eHealth Initiative, the Delmarva Foundation, and the Maryland-DC Collaborative for HIT. He is a member of the ACP's Medical Informatics and Performance Measures Subcommittees, and their Medical Services Committee. Dr. Basch also serves on the Advisory Committees to the DOQ-IT Projects for both DC and Maryland, and on the Health Information Technology Advisory Panel to JCAHO.

Jon Burns – UMMS

Jon Burns is Senior Vice President and Chief Information Officer for the University of Maryland Medical System. He is responsible for all information technology services and strategies across the eight hospital system. Mr. Burns has over 25 years experience in the health care industry in the not-for-profit provider sector. Prior to joining UMMS in May of 2006 Mr. Burns was Senior Executive of Information Technology for the Cleveland Clinic Health System. Mr. Burns was also responsible for technology support to the Cleveland Clinic Lerner College of Medicine and a number of emerging technologies initiatives across the Cleveland Clinic Health System. He served as the Chief Technology Officer of eCleveland Clinic, an INTERNET based care delivery model. Prior to joining Cleveland Clinic in 1998, he was Vice President and CIO for Forum Health, a four-hospital teaching organization based in Northeast Ohio. Mr. Burns also has served in a number of senior level financial and operational positions at UNC Hospitals, Chapel Hill, NC, and the Geisinger Health System in Danville Pennsylvania. While at UNC, he was appointed as Faculty Associate at UNC's School of Public Health-Department of Health Policy and Administration.

Mark Erickson – The Erickson Foundation

Mark Erickson is the Chief Operating Officer/President of Health and Operations for Erickson Retirement Communities with responsibility for the operations and development of the core senior housing business. He oversees the operations of a billion-dollar business that serves over 22,000 seniors and 11,000 employees at 18 continuing care retirement communities across the country.

Previously Mark served as the Chief Strategy Officer with responsibility for Strategy and Business Process Improvement, as well as several administrative functions including Government and Community Relations, Human Resources, Information Technology, Procurement, and Compliance. From 2002 through 2005 Mark served as Executive Director and Associate Executive Director at Oak Crest, a 1,500-unit continuing care retirement community that serves 2,000 seniors in Parkville, Maryland.

Before re-joining Erickson in 2000, Mark spent five years with American Express Consulting Services based in Europe and Asia. He completed a bachelor of arts in English literature at Vanderbilt University and earned an M.B.A. from the Wharton School at University of Pennsylvania.

Currently Mark serves as a board member or trustee for the following organizations: the Institute of Notre Dame, Leadership Baltimore County, the executive committee of the American Senior Housing Association, and Catholic Charities.

Patty Brown – Johns Hopkins

Patricia Brown is President of Johns Hopkins Healthcare, LLC , President of Johns Hopkins Employer Health Program, Inc and Senior Counsel for Johns Hopkins Health System. She is Responsible for managing 500+ employee managed care organization (MCO) and third party administrator (TPA), including 115,000 member Medicaid MCO, 45,000 member self funded ERISA plans, 25,000 commercial and other plans, and over \$700,000,000 in annual revenue. Provide oversight and direction to all MCO functions, including claims payment, customer service, client service, care management, disease management, and finance. Responsible for formulating and implementing managed care strategies affecting the Hopkins integrated delivery system and community. Responsible for developing, integrating and coordinating managed care contracting and payor strategy for all Johns Hopkins Medicine entities, including The Johns Hopkins Hospital, The Johns Hopkins Bayview Medical Center, Howard County General Hospital, The Johns Hopkins University School of Medicine, the Johns Hopkins Community Physicians and the Johns Hopkins specialty and primary care networks. Responsible for providing legal advice regarding managed care contracting, reimbursement issues, Medicare and Medicaid participation, certificate of need, and other regulatory matters. Prior to Patty's current position, she held many posts within Johns Hopkins beginning in 1994.

Patty received her Bachelor of Arts from University of Richmond in Political Science and Sociology/Anthropology with Magna Cum Laude honors. Patty went on to receive her Juris Doctorate from the University of Baltimore.

Stephanie Reel – Johns Hopkins

Stephanie L. Reel has been vice provost for information technology and Chief information officer for The Johns Hopkins University since January 1999. She is also vice president for information services for Johns Hopkins Medicine, a post she has held since 1994.

As CIO for all divisions of the Johns Hopkins University and Health System, Reel leads the implementation of the strategic plan and operational redesign for information services, networking, telecommunications, as well as, clinical, research and instructional technologies. Reel formed a governance structure to support funding and priority setting across both university and health system to meet the education and research needs of the enterprise.

Under her direction, the Health System implemented a version of the electronic patient record which was honored for its innovation by Computerworld magazine and the Smithsonian Institution with an award that remains on display in the Smithsonian's Museum of American History. She is now working with other leaders toward a regional electronic patient record.

Reel is involved in several other Web-based development initiatives across the university, such as: a university-wide internet student information system (ISIS) to provide easy access for students about admissions status, financial aid, registration, grades, student accounts, procurement support systems, and an Enterprise Resource Planning System, a combined JHHS /JHU financial systems solution.

Reel is the 2002 recipient of the National CIO 20/20 Vision Leader Award and was named CIO of the Year 2000 by the College of Healthcare Information Management Executives. Reel is a member of Educause, the Healthcare Information Systems Executive Association, the College of Healthcare Information Systems Executives, and the Healthcare Information Management and Systems Society, and the Inaugural Board of Directors Member of the National Alliance for Health Information Technology. She currently serves on the client advisory boards of IBM, GE Medical Systems, Eclipsys, Verizon, Compuware, and the Information Systems Advisory Council for the U.S. Department of Homeland Security.

Reel joined Johns Hopkins in 1990 with more than fifteen years of experience in information systems. She graduated from the University of Maryland with a degree in information systems management and holds an MBA from Loyola College in Maryland.

Letters of Support



June 4, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

Baltimore Medical Systems is pleased to support the Chesapeake Regional Information System (CRISP) for our patients in their pursuit of the MCHH/HSCRC implementation award to develop a statewide health information exchange in Maryland.

The Baltimore Medical System serves over 46,000 patients in many of the neediest communities within Baltimore City and Baltimore County communities with high rates of unemployment and poverty, low levels of education and job skills and few or no health services. BMS health services are provided through six full service primary care health centers, one specialty and ancillary health center and four school-based health sites. We reach out to populations that have all types of barriers to receiving even basic health.

We recently completed the implementation of electronic health records at all of our health centers. We truly believe that this will improve the quality of medical care that we provide. We are excited to partner with CRISP during their implementation of a health information exchange in Maryland and look forward to the benefits our patients and providers will receive from this important initiative.

Sincerely,

Jay Wolvovsky
President/CEO



June 9, 2009

Mr. David Horrocks
President
Chesapeake Regional Information System for our Patients
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

Bravo Health wholeheartedly endorses the efforts of CRISP in their application to the Maryland Health Care Commission to become the entity to develop the Maryland Health Information Exchange. Enhanced health information technology can play a central role in addressing challenging issues related to health care cost and quality. Creating the infrastructure to allow for provider and payor related linkages throughout the region is a critical step in advancing the evolution of the seamless and transparent exchange of data.

As a Maryland based company covering over 200,000 lives nationally, Bravo is actively engaged in its efforts to utilize technology to improve health care quality and cost efficiency. We have provided millions of dollars in support for health information technology programs to improve our efficiency in delivering services to our members and providers. We will continue to make significant investments to our systems to advance the goal of the State in this initiative

In an effort to achieve our vision of integrated delivery, a framework of partnerships, centers of excellence, excellent health education, and a holistic approach to medical issues and coverage, we are continually pursuing ways for improved, innovative care. We believe our vision is well-aligned with the goals of the CRISP organization. We congratulate CRISP for its efforts to engage many of the health care delivery stakeholders in Maryland. We fully support CRISP's initiative to implement a statewide health information exchange in Maryland. We believe work done by the CRISP organization will contribute to our goal of high-quality, compassionate care and ultimately improve the delivery of patient care in our State.

Sincerely,

Mark Puente
SVP, Medicaid Development

Chet Burrell
President and Chief Executive Officer

CareFirst BlueCross BlueShield
1501 S. Clinton Street, Suite 700
Baltimore, MD 21224-5744
Tel. 410-605-2558
Fax 410-781-7606
E-mail: chet.burrell@carefirst.com



June 5, 2009

Mr. David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David:

CareFirst BlueCross BlueShield (CareFirst) feels strongly that the efficient application of health information technology can play a central role in addressing challenging issues related to health care cost, quality and transparency. Creating health information technology linkages throughout the region is an important and necessary step. Accordingly, we are pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in its pursuit of the Maryland Health Care Commission/Health Services Cost Review Commission implementation award to develop a statewide health information exchange in Maryland.

As Maryland and the Mid-Atlantic's largest health insurer with nearly 3.4 million members, we are actively engaged externally and internally in efforts to utilize technology to improve health care quality and cost efficiency. We have provided millions of dollars in support for health information technology programs at the community, hospital, and regional level. In supporting such projects, we seek to catalyze the application of technology to the benefit of both CareFirst members and non-members alike. At the same time, we are making significant investments internally to create unmatched ability to exchange information with and serve the needs of our members, the medical community, employers and individuals.

CRISP's application to create a statewide health information exchange is conceptually consistent with the direction of the many health information technology initiatives underway at CareFirst. We support CRISP's pursuit of the implementation award, and look forward to the opportunity to work with CRISP in the future.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chet Burrell".

Chet Burrell
President and Chief Executive Officer



June 4th, 2009

Ritu Agarwal, Ph.D.
Robert H. Smith Dean's Chair of Information Systems
Director, Center for Health Information and Decision Systems

CHIDS
Van Munching Hall
College Park, MD 20742
University of Maryland
www.smith.umd.edu/chids
chids@rhsmith.umd.edu
301.405.2206

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

The Center for Health Information and Decision Systems (CHIDS) at the University of Maryland, College Park, MD is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

CHIDS is an academic research center that is designed to research, analyze, and recommend solutions to challenges surrounding the introduction and integration of information and decision technologies into the health care system. We serve as a focal point for thought leadership around the topic of health information and decision systems. We draw on the expertise of the Decision, Operations and Information Technologies department at the Smith School, the University of Maryland Medical Center, University Hospital, and other assets in the University of Maryland network.

As we continue to focus on integrating technology into the health care system, we are excited to partner with CRISP on their implementation of a health information exchange (HIE) throughout the state of Maryland. In our role as the leading university campus within the state of MD University System, and as educators and researchers, we share a common goal of improving the economic and social well-being of citizens of the state. We believe Maryland is uniquely positioned to be a best practice example for other states seeking to implement HIEs. The center's research on how IT can be leveraged to alleviate quality and cost concerns in healthcare delivery will provide important insights as the HIE implementation effort unfolds.

Sincerely,

Ritu Agarwal



COMMUNITY HEALTH
INTEGRATED PARTNERSHIP
Community • Clients • Caring

May 19, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear Mr. Horrocks:

Community Health Integrated Partnership (CHIP) is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in its pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

CHIP's membership is comprised of eleven Federally Qualified Health Centers (FQHCs). CHIP's health centers serve over 173,000 uninsured, Medicaid, Medicare and commercially insured patients at 57 delivery sites located throughout urban and rural Maryland.

As a leader and advocate for quality community-based health care services in Maryland, CHIP provides these community health centers with the business expertise to achieve the shared goal of quality improvement in the care they deliver. As part of these services, CHIP provides Practice Management and Electronic Health Record systems to our member health centers. Our current implementation of GE's Centricity Ambulatory EMR product is being rolled out to 42 separate locations of care across the state (two of our member health centers already have EHRs in place).

Providing health care services to patient populations that largely uninsured and chronically ill presents a host of treatment compliance challenges which a health information exchange will help alleviate. One of the most significant of these is the use of emergency departments for non-emergent care that with an "exchange of key health information" we can begin to reverse. In addition, the rapid access to diagnostic and specialty consult reports is critical to our management of our chronically ill patients which a health information exchange will facilitate. CHIP is very excited about the opportunities a state-wide exchange will bring to our centers and look forward to integrating our systems with the larger effort.

We believe CHIP will bring a unique perspective to the CRISP effort given our significant experience managing the unique challenges posed by delivering health care services to underserved populations. We look forward to working with CRISP in this important initiative.

Sincerely,

Salliann Alborn
Chief Executive Officer



Calvert Memorial Hospital

Tradition. Quality. Progress.

May 31, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

Calvert Memorial Hospital (CMH), a non-profit community hospital in Calvert County, Maryland, is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

As a leading provider of healthcare in southern Maryland, CMH aims to bring quality care and innovative services to people throughout our community. To realize this goal, CMH utilizes health information technology to participate in several initiatives, including the national 100,000 Lives Campaign and our Patient Safety Report. For the 100,000 Lives Campaign, our hospital employs automated medication reconciliation to prevent adverse drug events. CMH also utilizes computerized systems to achieve other goals of the campaign and accurately measure health outcomes, including deploying rapid response teams; delivering reliable, evidence-based care for heart attack patients; and preventing surgical site infections, central line infections, and ventilator-associated pneumonia. CMH consistently achieves impressive metrics on its Patient Safety Report in part due to our use of computerized medical records systems to support best practices and measure health outcomes. We recently became the first hospital in the state of Maryland to implement eICU technology as part of the Maryland eCare initiative. Finally, it is noted that CMH has ranked first or second in the state these past two years in the implementation of medication safety practices and systems, according to a survey of 43 Maryland hospitals. The survey, conducted annually by the Maryland Patient Safety Center, helps facilities target areas for improvement. The survey is part of the MEDSAFE Project, a collaborative effort between the Maryland Hospital Association and the Delmarva Foundation.

In an effort to achieve our five pillars of excellence—quality, service, people, innovation, and finance—we are continually pursuing the latest technologies and advancements in patient care delivery. We believe our mission is well-aligned with the approach and mission of the CRISP organization. We fully support CRISP's application to implement a statewide health information exchange in Maryland. We believe the CRISP organization will contribute to our vision of innovative, patient-centric care and ultimately improve the delivery of patient care in our community. We look forward to the opportunity to work with CRISP in the future.

Sincerely,

Edward J. Grogan, MS-IST, CCE, CPHIMS
Vice President, Information Services
Chief Information Officer



William Saway, M.D., President
Marcia Schwartz, M.D., Ph.D., Vice President
Steven Noskow, M.D., Vice President
James R. Bellor, Jr., M.D., Secretary
David Leichtling, M.D., Treasurer

May 18, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Re: Letter of Support: Statewide Health Information Exchange

Dear David,

Columbia Medical Practice, the largest multi-specialty primary care group in Howard County, is pleased to support Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of implementing a statewide health information exchange in Maryland.

Columbia Medical Practice has twenty-seven doctors and mid-level providers in seven clinical departments: Family Practice, General Surgery, Gynecology, Internal Medicine, Pediatrics, Rheumatology, and Skincare. We have over 100,000 visits per year from a patient base of over 40,000 patients from Howard and surrounding counties.

As a practice, we are continually pursuing innovative ways to improve patient care, including the use of an electronic medical record system throughout all our departments. Our practice has been recognized by the National Committee for Quality Assurance for meeting the highest standards and performance benchmarks in the use of electronic medical records to enhance patient care. We have also been selected by Medicare to participate in a 5-year Electronic Health Record Demonstration to examine the impact of an EHR to improve the cost and quality of care for Medicare patients.

Columbia Medical Practice believes strongly in the virtues of personalized care and patient satisfaction. We believe our vision is well-aligned with the goals of the CRISP organization and fully support CRISP's initiative to implement a statewide health information exchange in Maryland. We believe work done by the CRISP organization will contribute to our vision of high quality, personalized care and ultimately improve the delivery of care in Howard County as well as across Maryland.

Sincerely,

A handwritten signature in black ink, reading "DeWayne Oberlander".

DeWayne Oberlander, MBA, MPH
Executive Director

A handwritten signature in black ink, reading "W. Saway".

William Saway, MD
President



June 8, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

Erickson Retirement Communities is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

Erickson, based in Baltimore County, MD, has been developing and managing retirement communities for more than 25 years. Our communities offer residents many services that allow them to have a maintenance-free lifestyle. One of our unique services on each campus is the Medical Center that is staffed by board certified primary care physicians that specialize in geriatrics. We have deployed GE's Centricity Ambulatory Electronic Medical Record to all 19 community medical centers. Recently we also launched a collaborative project with St. Agnes Hospital which established instant patient data exchange between the Electronic Medical Records systems of Erickson and St. Agnes. This is the first time in the United States that such a system has been developed between a hospital and a continuing care retirement provider. Having this technology available enables our physicians to have the most accurate information about each resident and in turn assures residents that they are receiving a high level of care.

Erickson has been supporting CRISP by providing in-kind donations and serving as an active partner throughout the planning process. We will continue to support CRISP on the health information exchange implementation in Maryland and are excited that this will further allow our residents' health to be a top priority.

Sincerely,

A handwritten signature in blue ink, reading "Rick Grindrod", with a large, stylized flourish at the end.

Bruce R. "Rick" Grindrod, Jr.
President and CEO



June 8, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

The Erickson Foundation is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

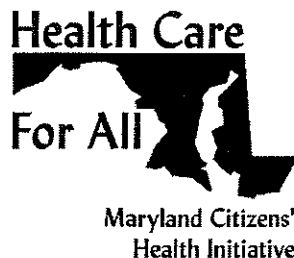
The Erickson Foundation mission is to enhance the present quality of life and futures of all citizens across the lifespan. We conduct research and activities as well as collaborate actively with selected partners that further the achievement of our mission. Organizations and projects that the Erickson Foundation has previously supported include: The University of Maryland Baltimore Campus, Teach for America, The Living Classrooms Foundation, The Caroline Center, NorthBay Camp, and Point Lookout.

As you know, The Erickson Foundation matched the MHCC funding CRISP received for the recent HIE planning effort. And our support of the Medication History pilot has led to important progress in the state. We are proud that our financial and leadership support has been impactful in launching CRISP, and setting it on a course for success. We look forward to continued participation with CRISP in this important work.

Sincerely,



John C. Erickson
Executive Chairman and Founder



Health Care for All!

Maryland Citizens' Health Initiative
2600 St. Paul Street
Baltimore, MD 21218

(410) 235-9000 (voice) ~~ (410) 235-8963 (fax)

info@healthcareforall.com (e-mail) <http://www.healthcareforall.com>

May 13, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

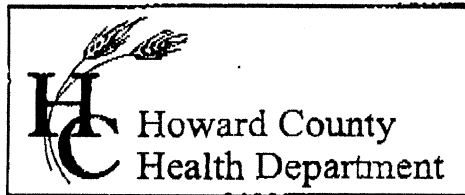
Maryland Health Care for All! Coalition, the largest coalition in Maryland and one of the largest health care consumer coalitions in the country, is pleased to support Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of implementing a statewide health information exchange in Maryland.

Maryland Health Care for All! Coalition was organized by the Maryland Citizens' Health Initiative Education Fund, a 501(c)(3) non-profit, for the purpose of creating a comprehensive, economically sound health care plan that will allow access to coverage for all citizens in Maryland. The plan was developed through a synergy of ideas from members of the Coalition, citizens at town hall meetings, public health experts from the Johns Hopkins University Bloomberg School of Public Health, and legal experts from the University of Maryland Law School. To date, over 700 faith, labor, business, health, and community organizations have joined the Coalition to support the plan.

In an effort to achieve our broader mission of educating all Marylanders on ways to achieve quality, affordable health care for all, we are continually promoting ways to increase access to care for citizens across Maryland. We believe our mission is well-aligned with the goals of the CRISP organization. We fully support CRISP's initiative to implement a statewide health information exchange in Maryland. We believe work done by the CRISP organization will contribute to our vision of affordable health care for all and ultimately improve the delivery of care for all patients in the state of Maryland.

Sincerely,

Vincent DeMarco
President



Office of the Health Officer
7178 Columbia Gateway Drive, Columbia, MD 21046
(410) 313-6300 Fax (410) 313-6303
TDD (410) 313-2323 Toll Free 1-866-313-6300
website: www.hchealth.org

Peter L. Beilenson, M.D., M.P.H., Health Officer

June 9, 2009

Mr. David Horrocks
President
CRISP
701 Maiden Choice Lane
Catonsville, Maryland 21228

Dear Mr. Horrocks:

I am pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC/HSCRC implementation award to develop a statewide health information exchange in Maryland. As the Health Officer for Howard County, I recognize the value that a health information exchange can have to improve the delivery of health care services for Maryland citizens.

As a leader in health care innovation in the state, Howard County strongly supports CRISP in their development of a statewide health information exchange. Howard County is always pursuing new ways to improve health care in our county and throughout the state as exemplified by the Healthy Howard Program.

CRISP has shown a clear devotion to improving health care for all Marylanders. By developing a health information exchange, CRISP will allow health care providers in Howard County and all around Maryland to work together to save lives and provide the best possible care to their patients. For all these reasons I believe that CRISP is the best candidate to lead Maryland in implementing a health information exchange. We look forward to working with CRISP as they work to establish a strong and secure health information exchange in Maryland.

Sincerely,



Peter Beilenson, M.D., M.P.H.
Health Officer



Jeff Singer, President & CEO

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Mercy Medical Center

Gustav L. Ketchersid
Thomas F. Lansdale III, MD

Pam Malester
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MedStar Health

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Nancy S. Grasmick

Dr. Karen Haller
Debora Perrone

Dr. M. Virginia Ruth
Dalton A. Tong

Paul J.M. Towell

Board Member Emeritus

Armand Levin

June 5, 2009

David Horrocks, President

Chesapeake Regional Information System for our Patients (CRISP)

701 Maiden Choice Lane

Catonsville, MD 21228

Dear Mr. Horrocks:

Health Care for the Homeless is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

Health Care for the Homeless (HCH) provides comprehensive medical care, mental health services, social services, addiction treatment, and access to housing and employment for nearly 12,000 Marylanders during more than 74,000 patient visits annually at clinic sites in Baltimore City, Frederick, and Montgomery, Harford, and Baltimore Counties. As a sign of our commitment to quality care and performance improvement, we were accredited in 2000 by the Joint Commission (formerly the Joint Commission on Accreditation of Healthcare Organizations) and remain the only independent HCH project in the country to maintain this distinction.

In Baltimore City, our services are delivered through interdisciplinary teams and are designed to meet the full range of needs presented by people experiencing homelessness. Our staff of more than 115 professionals includes physicians, psychiatrists, physician assistants, adult nurse practitioners, registered nurses, medical assistants, referral specialists, mental health therapists, social work case managers, certified addictions counselors, and support personnel. Having adopted a computer-based practice management system in 2006, we are now participating with the Community Health Integrated Partnership to transition to Electronic Health Records by the end of this year.

Ensuring that people experiencing homeless receive high-quality health care helps to reduce the societal costs of providing emergency or episodic care to vulnerable populations. The implementation of a statewide Health Information Exchange will enable us to deliver more comprehensive and effective care. We look forward to partnering with CRISP on this important initiative.

Sincerely,

Jeff Singer, President & CEO

HEALTH CARE
FOR THE
HOMELESS

111 Park Avenue • Baltimore, MD 21201 • 410/837-5533 • Fax: 410/837-8020

www.hchmd.org • info@hchmd.org



Stephanie L. Reel

*Chief Information Officer
Vice President
Information Services*

Information Services

5801 Smith Avenue, Suite 3110C
Baltimore, Maryland 21209
410-735-7333 T
443-287-9356 F



June 8, 2009

Mr. David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

Johns Hopkins Medicine, a large healthcare delivery system based in Baltimore, Maryland is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

The mission of Johns Hopkins Medicine is to improve the health of the community and the world by setting the standard of excellence in medical education, research and clinical care. We are continuously making advancements in technology to provide enhanced care to our patients. Currently we are creating an Enterprise Patient Record (EPR) system and implementing an Enterprise Longitudinal Repository, among many other initiatives.

Serving as a partner organization to CRISP has allowed us the opportunity to be an active contributor during the HIE planning process. We look forward to further supporting CRISP with the implementation of a health information exchange in Maryland.

Sincerely,

A handwritten signature in black ink that reads "Stephanie L. Reel".

Stephanie L. Reel



2401 West Belvedere Avenue
Baltimore, MD 21215-5271
410-601-5521
410-601-8377 fax

June 9, 2009

Karen R. Barker
Vice President
Chief Information Officer

Mr. David Horrocks
President
Chesapeake Regional Information System
For our Patients (CRISP)
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

The past year has been filled with achievements for both of our organizations related to the development of health information exchanges that will benefit the continuity of care for patients in Maryland. As the deadline for the submission of your application approaches, LifeBridge Health is pleased to support CRISP in your pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

As you know, this year LifeBridge brought live a private health information exchange between our two acute care hospitals (Sinai Hospital of Baltimore and Northwest Hospital) and St. Agnes Hospital. Our Emergency Room physicians have already noted the value of the clinical summaries we are exchanging with St. Agnes and indicated that we have made a positive initial step toward providing them with the information necessary to quickly and effectively care for patients. During the same period, we have been excited about the progress that CRISP has made in developing a broad coalition of providers to develop a plan for a statewide exchange.

During the past decade, LifeBridge has been laying the ground work to improve the delivery of care through the use of electronic medical records, computerized provider order entry with clinical decision support and a private health information exchange. We are confident that supporting CRISP on the health information exchange implementation in Maryland will allow us to continue to use technology to provide better care for our patients. We look forward to having a partnership with CRISP

Sincerely,

A handwritten signature in black ink that reads "Karen R. Barker".

Karen R. Barker
Vice President and CIO



MedStar Health

June 4, 2009

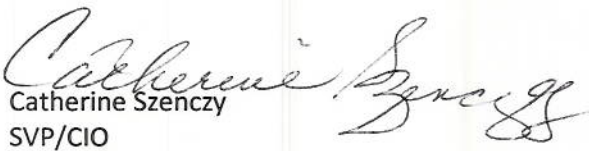
David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

Medstar Health, a non-profit regional healthcare system, that serves more than a half million patients annually, is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in its pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

MedStar has contributed time and leadership expertise to CRISP since its founding, and we are excited to serve as a CRISP partner organization in this important initiative. The implementation of a health information exchange will undoubtedly improve the quality of care not only to our patients but patients throughout Maryland.

Sincerely,


Catherine Szency
SVP/CIO



MHA
6820 Deerpath Road
Elkridge, Maryland 21075-6234
Tel: 410-379-6200
Fax: 410-379-8239

May 26, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

The Maryland Hospital Association (MHA) is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC/ HSCRC implementation award to develop a statewide health information exchange (HIE) in Maryland.

MHA was founded in 1970 as a forum for cooperation and communication among the state's major providers of health care. The association represents Maryland hospitals and health systems through leadership, education, information, communication, and collective action in the public interest. Outreach and education to the hospitals in the state will be integral in the success of an HIE in Maryland. MHA looks to partner with CRISP to facilitate communication and ensure engagement with our hospitals.

There are many challenges that hospitals are facing today and it is imperative that we continue to identify ways to perform better. The implementation of a HIE in Maryland will enable our hospitals to provide better care, improve safety, and increase patient satisfaction.

We are excited to work closely with CRISP as they implement a Health Information Exchange in Maryland and are looking forward to supporting their partnership with hospitals in the state.

Sincerely,

A handwritten signature in black ink that reads 'Carmela Coyle'.

Carmela Coyle
President and CEO



June 5, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David:

Peninsula Regional Medical Center, a 366 bed component at the hub of the Peninsula Regional Health System, is pleased to extend support to the Chesapeake Regional Information System for our Patients (CRISP) in pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

As an independent, not-for-profit community – owned institution, Peninsula Regional continues its 111 year commitment to expand and improve services to meet the health demands of an ever changing population. The medical center has established a leadership role in the implementation, adoption and use of information technology to support our goal of providing the highest quality and safest care to our patients. Supporting the elements of an electronic medical record, particularly closed-loop medication management comprised of CPOE, robotic dispensing and point of administration scanning of bar-coded medications – our medical center's accomplishments and the path taken to achieve them has placed us well ahead of the majority of organizations in the state and across the nation. The accompanying document provides additional details regarding the medical center, our accomplishments and the underlying information systems supporting our mission.

Given a dedication and commitment to the goal of delivering the highest quality and safest care to the communities we serve supported by the effective and efficient application of technology, we are pleased to extend our support to CRISP in its effort to develop and implement a statewide Health Information Exchange. Through our partnership we look forward to the opportunity to play a significant role in extending the use of information technology to support the delivery of the highest quality care to residents of the Delmarva Peninsula and the state of Maryland.

Sincerely,

A handwritten signature in cursive script, appearing to read "Peggy Naleppa".

Peggy Naleppa
President, Chief Executive Officer
(410) 543-7116

A handwritten signature in cursive script, appearing to read "Raymond W. Adkins".

Raymond W. Adkins
Chief Information Office
(410) 543-7433

Attachment

File name: Letter of support, CRISP.doc



100 E Carroll Street
Salisbury, MD 21801
www.peninsula.org

Organization Statistics (FY08)

Licensed/Staffed Beds:	366/282
Annual Admissions:	21,022
Births	2,301
Emergency Dept Visits:	75,459

Installed McKesson Solutions

Clinicals:

ANSOS – Nurse/Staff Scheduling
Horizon Admin-Rx (eMAR / Med Barcode Med Admin)
Horizon Care Alerts
Horizon Emergency Care
Horizon Expert Documentation (Charting)
Horizon Care Record (EMR)
Horizon Health Summary
Horizon Order Management
Horizon Patient Folder (Doc Imaging)
Horizon Surgical Manager (OR Mgt / Peri-OP)
Horizon Cardiology

Physician Solutions:

Horizon Expert Orders (CPOE)
Horizon Expert Notes (Documentation)
Horizon Physician Portal

Pharmacy:

Horizon Meds Manager
Packaging Solution
AcuDose (Medication Cabinets)
RobotRx (Robotic Dispensing)
Narc Station

Medical Imaging:

Horizon Medical Imaging (PACS)

Financial Decision Support:

Horizon Performance Manager
Financial Analyst
Clinical Analyst
Cost Manager
TrendSTAR HSL & CCA

Revenue Cycle:

Pathways Compliance Advisor
Horizon Business Folder
STAR Patient Mgt
Horizon Enterprise Revenue Management

Resource Management:

Pathways Financial Manager (AP/GL)
Pathways Healthcare Scheduling
Horizon Business Insight
Passport

Pharma Distribution - McKesson

Peninsula Regional Medical Center, a 366 bed component at the hub of the Peninsula Regional Health System, is a 111-year-old, fully Joint Commission accredited tertiary care facility featuring Delmarva's widest array of specialty and sub-specialty services. Over 300 physicians and 3,000 health care professionals and volunteers provide the care and compassion that nearly 500,000 patients rely on each year for inpatient, outpatient, diagnostic, subacute and emergency/trauma services.

Awards & Recognitions

Peninsula Regional Medical Center has been awarded HealthGrades 2009 Distinguished Hospital Award for Clinical Excellence based on its clinical quality performance. It is the only hospital on the Delmarva Peninsula to achieve this distinction, and one of just 270 in the nation. According to the HealthGrades study, patients admitted to a hospital receiving this award are, on average, 27 percent less likely to die and 8 percent less likely to suffer from a major complication.

In 2009, Peninsula Regional Medical Center was also recognized by HealthGrades for the following clinical achievements:

- Ranked #1 in the state of Maryland for overall orthopaedic services for the third consecutive year including a 5-Star rating for hip fracture repair.
- Ranked among the Top 5 hospitals in Maryland for heart care.
- Best rated on the Eastern Shore and 5-star rated for treatment of stroke.
- 5-star rated for critical care and a recipient of the 2009 HealthGrades Critical Care Excellence Award™, ranking among the top 10% in the nation.
- Best rated on the Delmarva Peninsula and 5-star rated for GI surgery.
- Best rated on the Delmarva Peninsula for overall pulmonary care. Recipient of the 2009 HealthGrades Pulmonary Care Excellence Award™, ranking among the Top 5% of hospitals in the entire nation. Peninsula Regional received 5-Star ratings for treatment of pneumonia and chronic obstructive pulmonary disease.
- Best rated on the Delmarva Peninsula and 5-star rated for general surgery.

Peninsula Regional has also been named a Bariatric Surgery Center of Excellence by the American Society for Metabolic and Bariatric Surgery. It also has the distinction of being the Delmarva Peninsula's only designated Joint Commission on the Accreditation of Health Care Organizations Primary Stroke Center.

Non-McKesson Solutions

Cardiology Hemodynamic – Witt Biomedical
Lab – Sunquest
Practice Management – AthenaHealth
Perinatal Documentation – GE QS



PRIMARY CARE
COALITION OF
MONTGOMERY COUNTY

*"Building a
Healthy Community"*

The Centers for:

Health Care Access

Medicine Access

Community-Based
Health Informatics

Health Improvement

Children's Health

June 11, 2009
Thomas Lewis, M.D.
Chief Information Officer
The Primary Care Coalition of Montgomery County, MD
8757 Georgia Ave, 10th Floor
Silver Spring, MD 20910

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

The Primary Care Coalition (PCC), a private, non-profit, charitable organization, is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

PCC seeks to provide access to high quality, culturally sensitive primary care and specialty care services to uninsured children and adults in Montgomery County. Since our founding in 1993, PCC has grown from a handful of volunteers to a robust organization with a staff of 70. We have served as an advocate for county residents without insurance or the resources to pay for health care, and have proven to be an efficient administrator of gap-filling programs in the county. Our vision is for all of Montgomery County residents to have the opportunity to live healthy lives.

We valued the opportunity to have participated with CRISP and contributed to its HIE planning project, which ran concurrently with the MCHIE planning effort that PCC helped lead with Dr. Roger Leonard from Montgomery General Hospital. We believe these two projects reached compatible conclusions, combining the perspectives of large integrated health care institutions and university medical centers with community hospitals needs and safety net clinics treating low income, uninsured individuals and families.

We look forward to participating with CRISP during the Health Information Exchange implementation through sharing our experience and progress in community hospital and safety net oriented HIE, bringing the needs and perspectives of community hospitals and the special challenges of using HIE to achieve better medical care for those traditionally excluded from mainstream health care not only in Montgomery County but throughout the state of Maryland.

Sincerely,

Thomas L. Lewis, M.D.

CFC #14000



Health Care for the Uninsured

2800 Kirk Avenue Baltimore, Maryland 21218
Clinic 410.467.7140 Adm 410.467.7146
shepherdsclinic.org f 410.467.7141

May 12, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David:

Shepherd's Clinic, a non-profit health clinic dedicated to serving Baltimore's uninsured, is delighted to support the Chesapeake Regional Information System for our Patients (CRISP) in seeking the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

Since 1991, Shepherd's Clinic has helped fill the health care needs of vulnerable Baltimoreans. Some 250 volunteer physicians, nurses, and others provide a full continuum of quality care specifically for uninsured adults in Baltimore, from primary care and mental health to wellness and surgical services. The Clinic opened 50,000 patient visits ago in order to offer these individuals an alternative to living with untreated illnesses. At the cost of one hour's wage for an office visit, they receive the care needed to prevent illness from becoming a medical emergency, to control chronic diseases such as diabetes and hypertension, and to receive annual screenings and care for common health problems. All clinic patients fall under 200% of poverty and nearly all are working or live in a household with an employed individual. Because of Shepherd's Clinic, more healthy adults contribute to the welfare of their families and our city.

While Shepherd's Clinic has been successful through its unique approach to addressing the health care needs of the uninsured, we are well aware that the incorporation of electronic medical records in our daily operations would greatly enhance service. Utilizing computerized records would help us accurately measure health outcomes and support best practices.

Shepherd's Clinic's mission is to provide quality health care to those who are unable to afford commercial health insurance and do not qualify for government assistance. To further this mission, we need to continually pursue the latest technologies and advancements in patient care delivery, while remaining sensitive to a nominal operating budget. We believe our mission is in sync with that of CRISP and fully support its application to implement a statewide health information exchange in Maryland. We look forward to a growing partnership.

Sincerely,

Jack VandenHengel,
Executive Director



SUMMIT HEALTH INSTITUTE FOR RESEARCH AND EDUCATION, INC.

Working to Eliminate Health Disparities and Aid Vulnerable Populations in Attaining Optimal Health

June 5, 2009

To Whom It May Concern:

Summit Health Institute for Research and Education, Inc., (SHIRE) is a 501(c) (3) nonprofit corporation committed to health equity and the attainment of optimal health for all U.S. residents. SHIRE has adopted a vision in which all residents of these United States enjoy quality healthcare as a right fully realized. SHIRE is in its twelfth year of continuous pursuit of the mission of eliminating disparities in healthcare delivery and health status outcomes among the underserved and populations of color in relation to the total U.S. population.

This letter of endorsement is submitted in keeping with these statements of vision and purpose. It is fervently believed that the successful transference of information technology into the health arena nationwide will have a significant and measurable impact by controlling costs, improving quality of care by reducing errors, and avoiding unnecessary duplication of services, as well as enhancing the quality and pervasiveness of prevention, early detection and chronic disease management. The result we envision is the empowerment of individuals and communities and the closing of health gaps among racial and ethnic groups.

SHIRE endorses the Chesapeake Regional Information Systems for our Patients (CRISP) application to compete for the state-wide Health Information Exchange (HIE) grant to be awarded by the Maryland Health Care Commission. In doing so, SHIRE expresses its confidence that, if successful in its application, CRISP will continue to demonstrate qualities that have inspired SHIRE's confidence during the past year. Specifically, we have experienced CRISP's willingness to listen and its appreciation of the need to incorporate the needs of the underserved and their providers in allocating resources, in planning, implementation and evaluation processes and assuring the availability of culturally and linguistically appropriate technical capacities. Also noteworthy is CRISP's awareness of the need for processes for assuring, with respect to health information technology privacy and confidentiality among populations for whom trust is a long-standing issue of concern.

Proposed Areas of Support

In addition to endorsing the CRISP application, SHIRE is prepared to provide other elements of support that should be formally included in any implementation plan that has promise for success. Among the critical contributions SHIRE is prepared to make all of the following:

1776 Massachusetts Ave. NW
Suite 615
Washington, DC 20036-1904

SHIRE Executive Officers

Russell J. Davis,
D.P.A., M.A.P.T.
President

Ruth T. Perot, M.A.T.
*Executive Director/
Chief Executive Officer*

SHIRE Board Members

Hector Balcazar, Ph.D.

Roger S. Clark, M.B.A.

Russell J. Davis,
D.P.A., M.A.P.T.

Marilyn Hughes Gaston, M.D.

Walter Lam

Gerrie Maccannon, M.P.A.

Singleton B. McAllister, J.D.

Ruth T. Perot, M.A.T.

Claudia Schlosberg, J.D.

Office: (202) 371-0277
Fax: (202) 452-8111
Toll Free: (877) 371-4900

Internet: www.shireinc.org

1. SHIRE is willing to draw upon its widespread expertise in designing, implementing and evaluating a process for successfully achieving education and outreach, statewide.
2. In the execution of #1, SHIRE will modify proprietary outreach and didactic materials developed to date.
3. A major strength of SHIRE is its capacity to develop, cultivate and sustain collaborations and partnerships. This ability and its sterling national reputation will advance the HIE's reach and impact throughout the state of Maryland and contribute to Maryland's standing as a leader in HIT integration regionally and nationwide.
4. During the past four or more years SHIRE has assume a leadership position among non-profit organizations with respect to advocacy for the inclusion and empowerment of the underserved, utilizing venues for debate, idea exchanges, as well as policy development/ advancement, review and refinement. Congressional and corporate briefings have been conducted, the results of which can be linked to recent HIT and other policy and program formulations manifested locally, regionally and nationwide. This background shall prove extremely valuable to CRISP.
5. In terms of national exposure potentially available to CRISP are the National HIT Collaborative for the Underserved (NHIT), led currently by Apptis, Inc., Association of Clinicians for the Underserved, HIMSS Foundation's Institute for E-Health Policy, eHealth Initiative Foundation, and the Office of Minority Health, HHS. These organizations currently comprise the Management Committee (MC) of the NHIT and provide policy guidance for the organization.
6. Additionally SHIRE has been invited by The California Endowment to submit an application to support NHIT's efforts to represent the needs and concerns of communities of color and other underserved populations with respect to the regulatory and policy development processes spearheaded by the Office of the National Coordinator for HIT, U.S. Department of Health and Human Services.

Summary

SHIRE has deep concern for the expanded involvement of the underserved and their providers in the advancing HIT movement. Furthermore, SHIRE firmly believes that this concern is shared by the leaders of CRISP. A nation that advances the cause of HIT as a primary modality in care delivery but fails to resource and meet the needs of the underserved will ultimately become a nation that more highly polarized and stratified - one in which disparities will be woefully exacerbated with resultant increased costs and other negative outcomes.

We wish you well!

Sincerely,

A handwritten signature in cursive script that reads "Russell J. Davis".

Russell J. Davis, DPA, MAPT
President

cc: Ruth T Perot, MAT
Chief Executive Officer

Marcia Thomas-Brown, MA
Program Coordinator, NHIT

St. Joseph Medical Center

May 22, 2009

David Horrocks
President, CRISP
Erickson Retirement Communities
701 Maiden Choice Lane
Catonsville, MD 21228

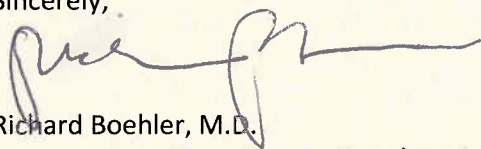
Dear David,

St. Joseph Medical Center, an acute care, regional medical center with 354 licensed beds, is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

I have been most impressed with the approach that CRISP has taken to address a healthcare information exchange. It has focused heavily on clinical experts in addition to those with technical expertise in designing the necessary systems. I find this particularly refreshing in that it has the great likelihood of meeting the needs of clinicians in managing the healthcare for their population of patients. Engaging the clinical staff from both hospitals and the community should help to ensure success.

At SJMC, our promise to patients is to be "always expert, always personal, always faithfilled". We are looking forward to the opportunity to work with CRISP and support their implementation of a health information exchange as it will allow us to continue to use technology and ensure our patients receive the best care possible.

Sincerely,



Richard Boehler, M.D.
Vice President for Medical Affairs/Chief Medical Officer



900 Caton Avenue
Baltimore, MD 21229-5201

410.368.6000 *phone*
www.stagnes.org *web*

May 28, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David,

St. Agnes Hospital, the first Catholic hospital in Maryland, located in Baltimore, Maryland is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

As a teaching hospital with residency programs in various medical/surgical specialties, our international reputation brings a global dimension to the St. Agnes brand of caring community medicine. The care we provide our patients is second to none. We are committed to innovative new programs that will address community needs while allowing us to deliver excellent care. This includes improving patient safety, overcoming disparities, and improving access to healthcare for all patients.

As you well know, St. Agnes has been a leader in HIE (Health Information Exchange) here in Maryland. We have operational HIE connections with key ambulatory partners and with LifeBridge Health. We are excited to see benefits such as we have already experienced, pursued on a statewide basis and reaching many more patients. We look forward to partnering with CRISP and successfully implementing a Health Information Exchange in Maryland.

Sincerely,

William Greskovich
Vice President of Operations and Campus Construction
Saint Agnes Hospital
410-368-3114



250 W. Pratt Street
24th Floor
Baltimore, Maryland 21201-6829
www.umms.org

CORPORATE OFFICE

June 1, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Catonsville, MD 21228

Dear David:

The University of Maryland Medical System is pleased to support the Chesapeake Regional Information System for our Patients (CRISP) in their pursuit of the MHCC / HSCRC implementation award to develop a statewide health information exchange in Maryland.

The University of Maryland Medical System is a regional provider of health care services to the citizens of Maryland. The Medical System is a not-for-profit health care corporation which operates 8 hospitals in Maryland and also has a 50/50 venture with Johns Hopkins Medicine on another. In partnership with the Medical Center, the University of Maryland School of Medicine and its affiliated practices are closely aligned in services and technologies on the combined campus. Like most Integrated Delivery Systems, the computing environment at UMMS is diverse and complex.

Our partnership with CRISP has allowed us to play an active role in the planning process of a statewide health information exchange. As we continue to make advancements in technology within our system we are excited to maintain our partnership with CRISP on this important initiative.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jon P. Burns', is written over a circular stamp that contains the name 'Jon P. Burns' and the title 'Senior Vice President and Chief Information Officer'.

Jon P. Burns
Senior Vice President and Chief Information Officer

:JPB



May 13, 2009

David Horrocks
President, CRISP
701 Maiden Choice Lane
Cantonsville, MD 21228

Dear David:

As president of Vermont Information Technology Leaders, Inc. (VITL), a non-profit public-private partnership charged with planning and operating one of the country's most successful health information exchanges, I am pleased to support Chesapeake Regional Information System for our Patients (CRISP) in its pursuit of implementing a statewide health information exchange in Maryland.

Since its incorporation in 2005, VITL has been partnering with hospitals, physician practices, and other health care organizations across the state of Vermont to implement IT projects to improve the quality and effectiveness of health care. In my role as president of the organization, I have worked to facilitate adoption of electronic health records (EHRs), improve the quality and efficiency of patient care, control health care costs, and foster health information exchange in Vermont. In pursuit of these aims, VITL is currently conducting several projects, including a Clinical Transformation Program to subsidize the cost of EHRs, an EHR Connectivity Service to route data through the VITL data center to physician EHRs, a VITL health information exchange, and a VITL Medication History Service. We are also working to develop a statewide immunization registry and a statewide e-prescribing program.

Throughout the CRISP planning process, I have worked closely with members of the organization to share ideas and lessons learned from our respective organizations. I believe CRISP has demonstrated great success in the planning phase of this process and is the best choice for successfully implementing a citizen-centric health information exchange in Maryland. As VITL works to coordinate our work with other health information exchange initiatives across the country, including the National Health Information Network (NHIN) and the national eHealth Initiative, I believe work done by CRISP will contribute to our country's broader vision of a nationwide health information exchange network and ultimately improve the delivery of care for patients in Maryland.

Sincerely,

Gregory Farnum
President

Job Position Descriptions

Chesapeake Regional Information System

For Our Patients (CRISP)

Position Description

Position Title: President of CRISP

Reports Directly To: CRISP Board

Reports Indirectly To:

Directly Supervises: All CRISP employees

Indirectly Supervises:

Location: Maryland

FLSA Status:

Job Code: CR0001

Approved Date

Hours/wk: 40

Salary: \$150k-\$225k

JOB SUMMARY: The President of CRISP will over see all of the daily operations of the organization. The President is also responsible for developing the strategic and tactical direction of the organization, in consultation with the Board. They will report to the Board of Directors, and are an ex-officio Director. The President will manage a team of employees and consultants throughout the implementation of HIE. They will act as the authorized representative of CRISP in all matters in which the Board of Directors have not formally designated another person to so act.

ESSENTIAL DUTIES AND RESPONSIBILITIES: include the following. Other duties may be assigned.

- Oversee daily operations and management of CRISP to ensure HIE implementation is successful and cost efficient.
- Establish organizational direction and the strategy and tactics necessary to accomplish company goals.
- Report regularly to the Board of Directors and Exchange Board of Advisors regarding pertinent issues.
- Provide leadership to all CRISP employees, consultants, and advisors.
- Create an organizational structure and culture to accomplish the mission.
- Ensure the application and implementation of all organizational policies.
- Establish operational budgets, and ensure execution within those parameters.
- Ensure appropriate records are kept and that necessary reports, returns, and filings can be prepared if needed.
- Build trust and loyalty within the Board of Directors.
- Work collaboratively with other organizations in Maryland during implementation of HIE.

QUALIFICATIONS:

To perform this job successfully: an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Previous experience as a senior executive, ideally including CIO experience in a healthcare organization.
- Proven effectiveness with Board management responsibilities.
- Ability to evaluate and solve complex problems and issues.
- Outstanding communication, organizational and interpersonal skills, especially with C-level executives.
- Budget creation and management skills.

- Very strong leadership, management and team-building skills.
- Possesses creativity, high energy, flexibility, and sound judgment.

EDUCATION and/or EXPERIENCE:

- Bachelor degree required. MBA or other Masters Degree strongly preferred
- 10+ years of Management experience
- Not-for-profit management experience preferred.

SUPERVISORY RESPONSIBILITIES:

All CRISP employees and contractors

LICENSES, CERTIFICATES, REGISTRATIONS:

N/A

Chesapeake Regional Information System For Our Patients (CRISP) Position Description

Position Title: PMO Director

Reports Directly To: President

Reports Indirectly To:

Directly Supervises: PMO team

Indirectly Supervises:

Location: Maryland

FLSA Status:

Job Code: CR0005

Approved Date

Hours/wk: varies

Salary: \$100-\$140/hour

JOB SUMMARY: The Program Management Office Director will oversee all of the daily operations of the PMO Office. They will be responsible for implementing HIE technology and leading various project teams to ensure effective and efficient roll out of Use Cases to each provider. The PMO Director will be a contractor from a reputable consulting company in Maryland.

ESSENTIAL DUTIES AND RESPONSIBILITIES: include the following. Other duties may be assigned.

1. Oversee daily operations of PMO office
2. Direct HIE implementation efforts through the state while providing leadership and consultation services to providers
3. Lead initial technology procurement process
4. Test and deploy technology for each Use Case
5. Collaborate with contracted systems integrators to ensure successful implementation
6. Work collaboratively with other organizations in Maryland during implementation of HIE
7. Provide support to CRISP President in determining necessary project resources
8. Ensures project plans are updated to reflect current status
9. Identify obstacles in implementation and assign resources to overcome them
10. Promote effective project management methodologies within CRISP.

QUALIFICATIONS:

The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Significant project management experience.
- Ability to evaluate and solve complex problems and issues.
- Outstanding communication, organizational and interpersonal skills with all levels in the organization.
- Strong leadership, management and team-building skills.
- Strong customer service skills in a professional business environment.
- Possessing a disciplined and organized approach to projects, and all elements of his or her work.

EDUCATION and/or EXPERIENCE:

- Bachelor degree required. MBA or other Masters Degree preferred.
- Background in IT/ Healthcare project management required.
- Experience with HIE technology and processes.

The PMO Director will ideally have deep expertise in Health Information Exchange technology, and will have earned previous experience implementing HIE services. The successful candidate will be part of a consulting firm that can bring additional HIE expertise to bear in support of implementation projects.

SUPERVISORY RESPONSIBILITIES:

PMO team members

LICENSES, CERTIFICATES, REGISTRATIONS:

N/A

**Chesapeake Regional Information System
For Our Patients (CRISP)
Position Description**

Position Title: VP of Technology
/CTO

Reports Directly To: President

Reports Indirectly To: N/A

Directly Supervises: System Analyst

Indirectly Supervises:

Location: Maryland

FLSA Status:

Job Code: CR0004

Approved Date

Hours/wk: FT

Salary: \$110k-\$150k

JOB SUMMARY: The VP of Technology/CTO will manage and direct all technological objectives of CRISP

ESSENTIAL DUTIES AND RESPONSIBILITIES: include the following. Other duties may be assigned.

1. Lead Technical Operations Department and all technical services implemented by CRISP
2. Manage data center operations
3. Oversight of Help Desk operations
4. Partner with external contractors to lead HIE implantation
5. Interface with providers to ensure user development of exchange supports user needs
6. Interface with industry on information management and information technology matters to identify new technologies
7. Direct HIE implementation efforts through the state while providing leadership and consultation services to providers
8. Collaborate with contracted systems integrators to ensure successful implementation
9. Work collaboratively with other organizations in Maryland during implementation of HIE
10. Provide support to CRISP President in determining necessary project resources
11. Ensures project plans are updated to reflect current status
12. Identify obstacles in implementation and assign resources to overcome them

QUALIFICATIONS:

To perform this job successfully: an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Significant project management experience
- Ability to evaluate and solve complex problems and issues.
- Outstanding communication, organizational and interpersonal skills with all levels in the organization
- Very strong leadership, management and team-building skills.
- Possession and demonstration of high energy, flexibility, creativity and good judgment.
- Optimistic, friendly disposition along with well-motivated and highly effective customer service orientation.
- Ability to communicate effectively, both verbal and written
- Strong customer service skills in a professional business environment

EDUCATION and/or EXPERIENCE:

- Undergraduate degree in Computer Sciences, Electrical Engineering, Information System or equivalent technically focused degree required.
- Post graduate degree in technology or business administration strongly encouraged.
- Experience managing large system implementations
- 10+ years in the information technology field

SUPERVISORY RESPONSIBILITIES:

System Analyst

LICENSES, CERTIFICATES, REGISTRATIONS:

N/A

Chesapeake Regional Information System

For Our Patients (CRISP)

Position Description

Position Title: Director of Outreach

Reports Directly To: President

Reports Indirectly To: N/A

Directly Supervises: N/A

Indirectly Supervises:

Location: Maryland

FLSA Status:

Job Code: CR0003

Approved Date

Hours/wk: 40

Salary: \$80k-\$110k

JOB SUMMARY: The Director of Outreach will manage relationships with key stakeholder that are participating in the HIE implementation. They will be responsible for outreach to providers and patients throughout the state. They will ensure that a variety of community outreach approaches are deployed to connect with a large and diverse group of consumers.

ESSENTIAL DUTIES AND RESPONSIBILITIES: include the following. Other duties may be assigned.

1. Serve as Marketing and Sales professional to ensure providers and patients are aware of the HIE implementation and how it can benefit their organization
2. Conduct informational presentations throughout the state with providers.
3. Conduct informational presentations throughout the state for patients.
4. Develop and maintain relationships with key stakeholders
5. Create and administer satisfaction surveys to measure HIE's performance
6. Partner with organizations such as MHA to develop relationships with hospitals in the state
7. Serve as liaison between CRISP team and provider/patient community to resolve and issues or concerns
8. Work with consulting partners to develop marketing materials that are targeted to appropriate populations
9. Develop regular HIE updates to be send to providers

QUALIFICATIONS:

To perform this job successfully: an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Ability to communicate effectively, both verbal and written
- Ability to organize and prioritize work
- Strong analytical analysis skills
- Thrive in a fast paced environment
- Strong customer service skills in a professional business environment

EDUCATION and/or EXPERIENCE:

- Bachelor degree required, MBA or Master's Degree preferred
- Background in Healthcare a plus
- 5+ years of management experience

- Consulting and project management experience required

SUPERVISORY RESPONSIBILITIES:

LICENSES, CERTIFICATES, REGISTRATIONS:

N/A

**Chesapeake Regional Information System
For Our Patients (CRISP)
Position Description**

Position Title: Clinical Assessment
Manager

Reports Directly To: President

Reports Indirectly To: N/A

Directly Supervises: N/A

Indirectly Supervises: Clinical Providers

Location: Maryland

FLSA Status:

Job Code: CR0002

Approved Date:

Hours/wk: 16 - 24

Salary: \$25k-\$40k

JOB SUMMARY: The Clinical Assessment Manager will be responsible for providing clinical leadership related to the deployment of the HIE. They will have a focus on monitoring the fair impact that the health information exchange may have on current clinical workflows.

ESSENTIAL DUTIES AND RESPONSIBILITIES: include the following. Other duties may be assigned.

1. Work collaboratively with providers and CRISP team to support all clinical aspect of the HIE implementation
2. Provide consultation services to providers and clinical teams as to workflow processes and technological solutions
3. Support providers in planning clinical resources required to achieve efficient processes
4. Provide innovative solutions to increase acceptance and adoption of HIM at each location
5. Identify educational needs of the systems end-users
6. Assist in development of "best practice" policies and procedures pertaining to the use of the HIM

QUALIFICATIONS:

The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Experience in workflow design
- Ability to communicate effectively, both verbal and written
- Ability to document business and functional requirements
- Ability to manage priorities, both individually and for a team

EDUCATION and/or EXPERIENCE:

- Active RN licensure required.
- Strong computer literacy
- Project management experience
- Experience with the internet and web applications
- Excellent verbal and written communications skills

SUPERVISORY RESPONSIBILITIES:

Indirectly supervises clinical provider

LICENSES, CERTIFICATES, REGISTRATIONS:

The candidate is expected to have a current nursing certification for the state in which they operate, including a RN license

Chesapeake Regional Information System

For Our Patients (CRISP)

Position Description

Position Title: Admin. Assistant**Reports Directly To:** President**Reports Indirectly To:** N/A**Directly Supervises:** N/A**Indirectly Supervises:** N/A**Location:** Maryland**FLSA Status:****Job Code:** CR0006**Approved Date:****Hours/wk:** 20-40**Salary:** \$20k-\$40k

JOB SUMMARY: The Administrative Assistant is responsible for clerical/secretarial duties. This person should be able to handle and maintain secretarial/administrative duties in a very professional manner, able to work very close with the President and give support to others as needed. This individual must be computer literate with knowledge of Microsoft Office and must be willing to learn other application software relating to administrative functions.

ESSENTIAL DUTIES AND RESPONSIBILITIES: include the following. Other duties may be assigned.

1. Coordinate company events with the President, especially board meetings.
2. Administer and maintain the President and Directors' calendars using Microsoft Outlook. Scheduling meetings and appointments.
3. Arrange and coordinate travel schedules and reservations for the staff.
4. Read and route incoming mail.
5. Compose and type correspondence for the President and Directors.
6. Schedule appointments/meetings for the company.
7. Answer the President's telephone when requested, screen and re-route calls as deemed necessary.
8. Order and maintain supplies, and arrange for equipment maintenance for the company.
9. Manage vendor invoice processing with the President, and code invoices to be approved for payment.
10. Conduct research and compile and type statistical reports.
11. Organizes and maintains file system, and files correspondence and other records.
12. Handle other administrative duties as requested.

QUALIFICATIONS:

To perform this job successfully: an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skill, and/or ability required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

- Detail oriented and highly organized, able to handle multiple tasks simultaneously
- Ability to communicate effectively, both verbal and written
- Ability to manage priorities
- Computer experience is required

EDUCATION and/or EXPERIENCE:

2-5 years of administrative/office experience

SUPERVISORY RESPONSIBILITIES:

N/A

LICENSES, CERTIFICATES, REGISTRATIONS:

N/A

Chesapeake Regional Information System For Our Patients (CRISP) Support Position Qualifications

Support Function	Qualifications	Salary
Legal	• Specialization in health IT issues • Thorough knowledge of privacy laws • Contract negotiation experience • Ability to research questions of law and manage any legal issues arising from planning and implementation • Familiarity with the evolving landscape for HIE's • Experience: 10+ years as a practicing lawyer, preferably at a firm with additional supporting resources	\$300-\$400/ hour
Government Affairs	• Strong network of healthcare contacts in Maryland • Thorough understanding of the workings of the Maryland state government • Ability to motivate people to take action • Experience to guide CRISP in federal grant applications • Experience: 10+ years working in government affairs	\$3k-\$6k/month retainer
Strategic Advisors	• Experience implementing HIE Use Cases • Knowledge of the federal landscape for HIEs • Entrepreneurial instincts that can be helpful to CRISP • Strong network of contacts in the HIE arena	\$125-\$250/ hour + travel expenses
System Analyst	• Ability to logically troubleshoot technical problems • Basic working technical knowledge of operating system platforms • 3 years of relevant IT experience • Education: Bachelor's degree in Information Systems or related field	\$50K-\$90K
Implementation Consultants	• Experience with project management methodologies • Strong customer interaction skills • 3 years of relevant IT implementation experience, ideally in health IT • Education: Bachelor's degree in Information Systems or related field	\$75-\$125/ hour

Scoring Matrix Mapping

RFA Response Category	Assumed Related Scoring Area	Response Page #
Vision, Mission, and Principles	Key operating principles	
<i>A. Vision statement</i>	Key operating principles	6
<i>B. Mission statement</i>	Key operating principles	6
<i>C. Principles</i>	Key operating principles	9
Financial Model and Sustainability	Revenue sources	
<i>A. Revenue sources</i>	Revenue sources	11
Feasible strategy for long-term funding and sustainability	Revenue sources	11 to 17
Revenue sources for start-up and ongoing operations	Revenue sources	13
Definition of fees	Revenue sources	11, 13
Strategy to secure additional funding	Revenue sources	12
<i>B. Budget</i>	Budget	12
Capital budget	Budget-capital, operating costs	13
Operating and costs statement	Budget-capital, operating costs	13,14,15
Statement of cash flows	Budget-cash flow	16
Break-even analysis	Budget-break-even analysis, return on investment	16
Return on investment	Budget-break-even analysis, return on investment	16
<i>C. Community benefit</i>	Other uses of the exchange	16,17
Detailed strategy to identify community benefits	Other uses of the exchange	16,17
<i>D. Benefit realization</i>	Other uses of the exchange	17,18
Agreeing and setting measurable goals	Other uses of the exchange	17,18
Clarifying roles and responsibilities	Other uses of the exchange	17,18
Adopting a stakeholder communication plan	Stakeholder outreach and education	17,18
Putting systems of support in place	Other uses of the exchange	17,18
Developing a strategy to manage resisters	Other uses of the exchange	18
Organizational Infrastructure	A sound governance structure	
<i>A. Ownership model</i>	A sound governance structure	19
Plan to achieve 501(c)(3) status	A sound governance structure	19
<i>B. Oversight of the Policy Board and the Commissions</i>	A sound governance structure	20
Acknowledgement of understanding	A sound governance structure	20
<i>C. Governance</i>	A sound governance structure	20
Composition of governance	A sound governance structure	20,21,22,23
Articles of Governance	A sound governance structure	19
Rules and by-laws	A sound governance structure	19
Key activities	A sound governance structure	22
<i>D. Operational structure</i>	A sound governance structure	23
Staff	A sound governance structure	23
Management positions and responsibilities	A sound governance structure	24
Line positions and responsibilities	A sound governance structure	24,25,26
Employee qualifications by position	A sound governance structure	Appendix
Salary requirements by position	A sound governance structure	Appendix
Operational duties	A sound governance structure	23
<i>E. Project management</i>	A sound governance structure	27
Team selection	A sound governance structure	27
Plan for team selection and project management	A sound governance structure	27
Staffing plan	A sound governance structure	27
Organizational chart	A sound governance structure	24
Work plan	A sound governance structure	27,28
Detailed timeline	A sound governance structure	27,28
Performance management	A sound governance structure	29
Performance management plan for accountability	A sound governance structure	29
Privacy and Security	Ability to formulate policy and implement policy	
Plan for collaboration with the Policy Board	Ability to formulate policy and implement policy	20
Plan for implementing privacy and security policies	Ability to formulate policy and implement policy	All pages in section, 33
<i>A. Access</i>	Ability to formulate policy and implement policy	34,35,39
Role-based access	Ability to formulate policy and implement policy	34,35,39
Identity proofing and authentication procedures	Ability to formulate policy and implement policy	34,35,39
Process for locating, transporting, and blocking consumer informat	Ability to formulate policy and implement policy	34,35,39
<i>B. Audit</i>	Ability to formulate policy and implement policy	35,36
Nature and location of access logs	Ability to formulate policy and implement policy	35,36
Description of audit functions	Ability to formulate policy and implement policy	35,36
Definition and process for dealing with breaches	Ability to formulate policy and implement policy	35,36
Depth of routine internal and external audits	Ability to formulate policy and implement policy	35,36
<i>C. Authorization</i>	Ability to formulate policy and implement policy	36,37,40
Plan for consumer authorization of providers	Ability to formulate policy and implement policy	36,37,40
Authorization of all treating providers	Ability to formulate policy and implement policy	36,37,40
Authorization of named provider organizations	Ability to formulate policy and implement policy	36,37,40
<i>D. Authentication</i>	Ability to formulate policy and implement policy	37,40
Identity proofing of providers within institutional systems	Ability to formulate policy and implement policy	37,40
Identity proofing of providers not part of a large system	Ability to formulate policy and implement policy	37,40
Identity proofing of consumers	Ability to formulate policy and implement policy	37,40
Comment on authentication requirements	Ability to formulate policy and implement policy	37,40
Outreach and Education	Stakeholder outreach and education	
<i>A. Consumer education</i>	Stakeholder outreach and education	41

<i>B. Provider education</i>	Stakeholder outreach and education	42
Fundamental Design	Infrastructure and data management approach	
<i>A. Data</i>	Infrastructure and data management approach	46
<i>B. Request for data</i>	Infrastructure and data management approach	47
<i>C. Exchange of data</i>	Infrastructure and data management approach	47,48
Data elements to be published to edge device	Infrastructure and data management approach	47,49
Persistence of information in edge devices	Infrastructure and data management approach	47,50
<i>D. Publishing data</i>	Infrastructure and data management approach	48,49
<i>E. Central infrastructure</i>	Infrastructure and data management approach	49
Master patient index	Infrastructure and data management approach	49,50,51
Record locator service	Infrastructure and data management approach	53,54
Permissions function	Infrastructure and data management approach	51,52
Future health record bank	Infrastructure and data management approach	52
Technical Architecture	Exchange architecture	
<i>A. Infrastructure</i>	Exchange architecture	55
<i>B. Service Oriented Architecture</i>	Exchange architecture	56
<i>C. Stakeholder implementation guides</i>	Exchange architecture	56
<i>D. Interstate exchange</i>	Exchange architecture	56,57
<i>E. Underserved populations</i>	Exchange architecture	57
<i>F. Interoperability</i>	Exchange architecture	57,58,59
<i>G. Personal health records</i>	Exchange architecture	59
<i>H. Electronic health records</i>	Exchange architecture	59,60
<i>I. Infrastructure security and penetration testing</i>	Exchange architecture	Appendix
Standards	Exchange architecture	
Process for selecting, managing, and implementing standards	Exchange architecture	61
<i>A. Message and document formats</i>	Exchange architecture	61
<i>B. Clinical terminology</i>	Exchange architecture	61,62
<i>C. Integration profiles</i>	Exchange architecture	62
Exchange Functionality	Ability to implement an exchange	
<i>A. Use cases</i>	Ability to implement an exchange	63
<i>B. HIE services</i>	Ability to implement an exchange	63-75
Implementation strategy	Ability to implement an exchange	63-75
Order of initial use cases	Ability to implement an exchange	63-75
Sequence and timeline for remaining use cases	Ability to implement an exchange	63-75
Initial use cases	Ability to implement an exchange	63-75
Remaining use cases	Ability to implement an exchange	63
Exchange Participants	Broad statewide stakeholder participation and commitment letters	
<i>A. Strategy for connecting phase one participants</i>	Broad statewide stakeholder participation and commitment letters	77
<i>B. Strategy for connecting phase two participants</i>	Broad statewide stakeholder participation and commitment letters	77
Analytics/Reporting	Infrastructure and data management approach	
Plan for stakeholder access to analytic and reporting tools	Infrastructure and data management approach	79-80
Approving stakeholder request for data/granting data access	Infrastructure and data management approach	79-80
Use of secondary data	Other uses of the exchange	79-80
Appendices		
MHCC Acknowledgements	Required by RFA	Appendix
MHCC Addendum 3 Response	Required by RFA Addendum	Appendix
Curricula Vitae	Ability to implement an exchange	Appendix
Letters of Support	Broad statewide stakeholder participation and commitment letters	Appendix
Job Descriptions	Ability to implement an exchange	Appendix
Scoring Matrix	CRISP Addition	Appendix