A Pilot Implementation of DIRECT Messaging and Provider Directory Services in the Palomar Health District

Project Overview and Plan

Sujansky & Associates, LLC

1. Project Objectives

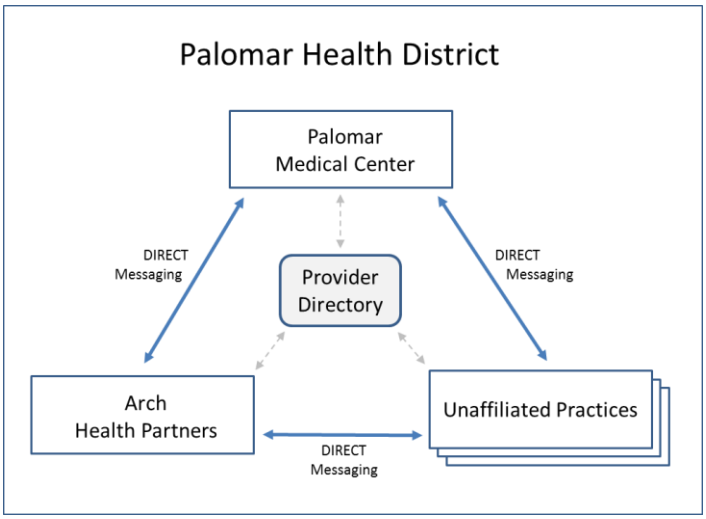

Figure 1. High-level objectives of the project.

The project has two objectives:

1. To assess the practical feasibility and effectiveness of the DIRECT specifications for secure exchange of patient information and the HPDPlus specifications for provider directory services. We will implement these specifications in the Palomar Health District to enable the exchange of discharge summaries, referral requests, and specialty consult notes among multiple provider organizations that use disparate I.T. products. If the standards work as intended, these organizations will be able to electronically exchange information in an efficient, reliable and secure manner that is consistent with their current clinical work flows and business practices. If the standards do not work as intended, we will be in a position to report on their specific deficiencies and comment on the general feasibility of the DIRECT model as a foundation for health information exchange and meaningful use.
2. To create a foundation based on the DIRECT and HPDPlus specifications for all the provider organizations in the Palomar Health District to electronically exchange patient health information in a convenient, secure, and reliable way. The project will lay a technology foundation consisting of commercial products and industry standards. If the results of the pilot implementation prove effective and useful, the healthcare community will be in a

position to sustain and expand upon this foundation via self-funded upgrades to their own health information technologies and shared support for a modest common infrastructure.

2. Project Background

This project will evaluate the technology standards and policies developed by the national DIRECT Initiative by deploying a pilot infrastructure based on these standards at several independent provider organizations in the Palomar Health District in California. This section provides background on the DIRECT Initiative and the Palomar Health District.

2.1. DIRECT Initiative

The DIRECT Initiative is a project sponsored by the Office of the National Coordinator for Health Information Technology (ONC) to develop a set of interoperability standards and policies for the electronic exchange of patient health information. The initiative, which was launched in 2010, seeks to foster the electronic transmission and receipt of patient health information (PHI) in a structured format, replacing prevailing paper-based and unstructured communication mechanisms, such as surface mail and faxing. A major impetus for the initiative is to enable the exchange of PHI among users of Electronic Health Record Systems (EHRs), as required under CMS's meaningful use incentive program.

The DIRECT initiative is distinct from previous government and private projects for health information exchange in that it does not require the centralized storage of patient data in clinical data repositories, patient locator services, or master patient indexes. It also does not require participating entities to make their PHI available for automated querying by other entities. These requirements complicated and often hindered previous efforts at health information exchange by creating perceived legal and business risks for participating entities, as well as governance and sustainability challenges owing to the need for a significant centralized technology infrastructure.

The DIRECT initiative, in contrast, is pursuing a less complex, but perhaps more important goal: Creating a ubiquitous decentralized electronic infrastructure for provider organizations, regardless of size or business affiliation, to send each other structured patient information in a secure and trusted way. The initial intent of such an infrastructure is to facilitate exchanges of PHI that already occur in the course of clinical care and that participants already accept as low-risk aspects of their standard business practices. Examples of such exchanges include the sending of discharge summaries, referral requests, or consult notes from one caregiver to another. As the infrastructure envisioned by DIRECT for these types of transactions emerges and providers and consumers gain comfort with it, it is hoped that more sophisticated patterns of health information exchange (including the community-wide sharing of PHI via centralized storage and/or distributed queries) will evolve atop this infrastructure.

In 2011, the DIRECT initiative published the specifications for a model of secure point-to-point health information exchange based on standard internet email protocols (e.g., SMTP) and widely used standards for securing email content (e.g., PKI and S/MIME). The DIRECT model envisions that all participating parties will use one of many Health Internet Service Providers (HISPs) as gateways to this standardized messaging channel. Parties wishing to exchange data will connect to their HISPs via various mechanisms, and the HISPs will send messages to and receive messages from other HISPs on their behalf using the SMTP and S/MIME protocols defined by DIRECT. Figure 2 illustrates this concept.

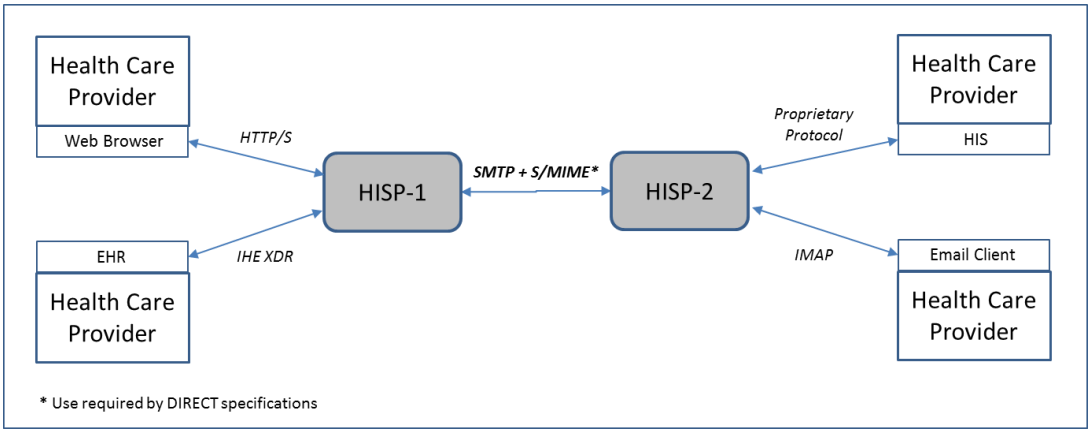

Figure 2. Components and paths for health information exchange as defined by the DIRECT specifications.

More recently, the ONC Standards & Interoperability Work Group and several collaborating organizations (such as Integrating the HealthCare Enterprise and the HIE/EHR Interoperability Work Group) defined a standard specification for electronic *Provider Directories* called HPDPlus ("Health Provider Directory Plus"). The intent of such directories is to provide parties that wish to participate in DIRECT exchange a standard way of finding and accessing information about their counterparties, such as their electronic addresses, digital certificates, accepted document formats, and identifying demographic information. The HPDPlus specification defines a standard web-services interface to provider directories that ostensibly enables any authorized HISP or end user to consult these directories. The California Health and Human Services Agency, under its HIT Cooperative Agreement Program funding, is planning to enhance these specifications to support a system of *federated* provider directories that can be operated by independent entities, but support global searches for provider information, ultimately across the entire state.

Parties can, strictly speaking, exchange information via the DIRECT protocols in the absence of provider directories if they already have each other's electronic addresses, digital certificates, and accepted document specifications. However, in practice, provider directories will be important resources for enabling widespread information sharing within and between medical communities because many members of these communities are "loosely coupled" and do not already have information about their counterparties or the information they have is subject to change. The project intends to implement and test the DIRECT messaging specifications and the HPDPlus provider directory specifications in tandem within a medical community.

2.2. Palomar Health District

The Palomar Health District is a non-profit, publicly-supported healthcare district centered in Escondido, CA and serving communities in an 850-square-mile area of North San Diego and South Riverside counties. The district includes three hospitals, the Palomar Medical Center (288 beds), Palomar Health Downtown Campus (95 beds), and Pomerado Hospital (107 beds), as well as a number of affiliated outpatient facilities (such as Arch Health Partners, a 55-physician multi-specialty group practice). The medical community also includes numerous smaller, unaffiliated medical practices that admit patients to the two hospitals and share patients with Palomar Health's outpatient facilities (i.e., referring their patients to these facilities and providing specialty consults on patients from these facilities). For example, Escondido Pulmonary Medical Group is a seven-physician group practice that provides pulmonology consults for patients referred by primary care physicians at Arch Health Partners and other practices; the Arthritis Care and Research Center is a solo group practice providing rheumatology care.

The adoption of health information technology in the community is variable but growing. The Palomar Health hospitals all use the Cerner inpatient EHR system and Arch Health Partners and Arthritis Care use the NextGen ambulatory EHR. Escondido Pulmonary Medical Group uses the GE Centricity ambulatory EHR, and other unaffiliated practices use different EHRs or have not yet adopted EHRs.

The provider organizations in this community routinely exchange health information for their shared patients, including discharge summaries sent by the two hospitals to Arch Health Partners and to the unaffiliated practices, as well as referral requests and consult notes exchanged among physicians at Arch Health Partners and the unaffiliated practices. However, much, if not most, of such exchange still takes place via fax machine and surface mail. In certain cases, subsets of these organizations have adopted proprietary technologies to facilitate electronic information exchange with each other, but there is no universal, community-wide mechanism for electronic exchange among all of the organizations. The project intends to assess, through actual implementation, the feasibility of the DIRECT specifications for secure messaging and HPDPlus specifications for provider directories as the basis for community-wide electronic information sharing in the Palomar Health District.

3. Audience/Stakeholders

There are a number of stakeholders for this project:

- The provider organizations in the Palomar Health District that are currently unable to exchange patient health information in a secure, electronic manner, necessitating less efficient methods (faxing, mailing, etc.) and the manual re-entry of structured data into EHRs.
- The healthcare provider organizations in the Palomar Health District that are currently able to exchange patient health information in a secure, electronic manner, but only with a small number of affiliated organizations that share their proprietary technology.
- Patients in the Palomar Health District whose clinical information is often unavailable to their providers in a timely manner or cannot be fully integrated into their providers' EHRs, possibly reducing their quality of care or increasing their health care costs.
- The developers of the DIRECT secure messaging standards within ONC and the H.I.T. vendor community.
- The developers of the HPDPlus provider directory standards within the ONC S&I initiative and the H.I.T. vendor community.
- The California Health and Human Services Agency (CHHSA) staff and contractors developing the federated provider directory standards for California
- The general H.I.T. stakeholder community interested in the practical feasibility of the DIRECT and HPDPlus standards to meet the CMS meaningful use requirements for EHR interoperability

4. Desired Outcomes

A successful project will yield the following outcomes:

1. Determination of whether the technical standards and protocols defined by the "Direct Initiative" can be practically applied in a healthcare community to enable point-to-point transmission of health information without requiring the participants to connect through a single shared messaging hub or formally join a centralized HIE entity.

2. Determination of whether the standards and protocols defined by the Direct Initiative for secure messaging and directory services can be implemented consistently by different I.T. vendors to achieve reliable peer-to-peer interoperability among un-affiliated healthcare organizations.
3. The ability for Palomar Medical Center, Arch Health Partners, and several local unaffiliated physician practices to electronically transmit patient-specific health information in a secure and trusted manner with a minimum of additional legal, administrative, or financial overhead. The deployed technologies can replace certain communications conducted via telephone, fax, post, and courier with equivalent electronic communications without compromising security or complicating workflow.
4. The availability of an electronic Provider Directory for the Palomar Medical Center, Arch Health Partners, and several local unaffiliated physician practices. This secure and trusted resource will enable lookup of the individual providers and organizational entities that can transmit and receive patient-specific health information via the standards and protocols of the Direct Initiative. The directory will be the only shared technology resource required for health information exchange.

5. Evaluation/Measurement

Following implementation and a two-month period of trial use, we will conduct an informal evaluation of the DIRECT messaging specifications and HPDPlus Provider Directory Specifications. We will collect data consisting of interviews with the users and technical staffs involved in the project, as well as logs of system use, errors, and technical support calls. We will also document and incorporate our own experiences in implementing, testing, and troubleshooting the DIRECT-messaging and Provider-Directory standards. Specific questions to be addressed will include:

- Do caregivers and their organizations trust secure messaging based on the DIRECT and HPDPlus specifications and recommended policies? If not, what technical or policy mechanisms are missing to achieve trust?
- Does the direct transmission ("push") of secure messages and structured documents to specific recipients meet the needs for health information exchange in a medical community? What goals do and do not such transmissions achieve?
- Does the model of HISPs as intermediaries in health information exchange meet the needs of both large and small provider organizations and enable them to interoperate in a mutually acceptable way?
- Are the DIRECT standards for interfacing between two HISPs and between an EHR and a HISP sufficiently precise and well-documented to enable different vendors to develop DIRECT-compliant products that interoperate without significant pair-wise customization? I.e., is DIRECT "plug-and-play"?
- Are the HPDPlus standards for web-services APIs to Provider Directories sufficiently precise and well-documented to enable different vendors to develop HPD+-compliant HISPs and Provider Directories that interoperate in a "plug-and-play" manner?
- Are the HPDPlus standards for the content of Provider Directories adequate for parties engaging in DIRECT exchanges within a community to locate and validate each other?

We will analyze the available data and prepare a report describing our findings, conclusions, and recommendations regarding the practical readiness of these standards for enabling health information exchange.