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# Building an HIE Foundation: Connecting Your Community For Meaningful Exchange

Author:  
Mike Murphy  
Director of HIE  
Forward Advantage, Inc.





## Building an HIE Foundation:

### Moving from Meaningful Use to Meaningful Exchange

By Mike Murphy, Director of HIE at Forward Advantage, Inc.

**The ability to exchange patient health information easily and securely is rapidly becoming an absolute necessity. In addition to expanded Meaningful Use requirements, market drivers and other factors are placing increased pressure on healthcare providers to become more efficient and effective. Examples include linking medical records in a community for better population health management, improved patient safety and health outcomes, and cost reduction. Healthcare Information Exchange (HIE) technology is an essential tool to address this evolving industry challenge.**

Today, most patient information is stored in disparate systems across the healthcare community. This includes physician offices, clinics, imaging facilities, and hospitals, many of which have systems that do not talk to one another. A practitioner in a private practice may have difficulty obtaining complete information about a patient that is currently hospitalized or may repeat tests and procedures, because he or she does not have prior information about the patient. Similarly, hospital-based providers may not have access to relevant patient information, such as current problems, medications, and allergy information that could enhance patient safety.

Paper records are fraught with issues. In addition to quality and safety challenges, manually handled paperwork is expensive for both patients and practitioners. For example, a patient may have to transport a paper copy of their record to a new provider, which requires the record to be faxed or copied to CD by the former provider. The alternative is that the patient's new provider has to provide care without any prior visit history.

Creating interoperability among healthcare systems to seamlessly and easily exchange information in near real time is critical to making meaningful improvements in healthcare delivery. The combination of a robust record locator service (RLS) and a comprehensive patient identity cross-reference

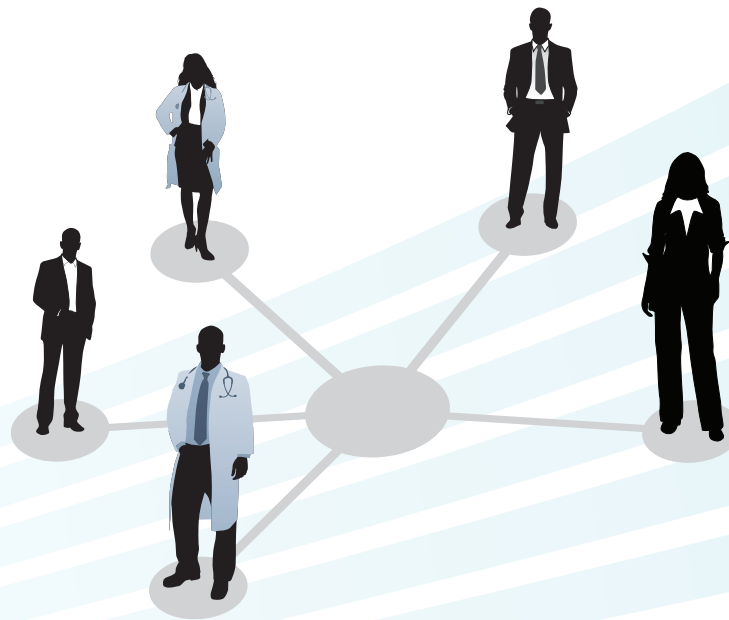
#### About the Author:

Mike Murphy has more than 25 years of experience in information technology and telecommunications. During the past six years, he has focused on the application of these tools within the healthcare domain.

(PIX) capability supports this goal by providing the ability to determine the location of a patient's health records and retrieve them for patient care.

For Stage 1 Meaningful Use, the bar for information exchange was set relatively low. All that is required is the ability to electronically exchange key clinical information among care providers and patient-authorized entities. The measure for this objective is simply to perform at least one test of a certified EHR's capacity to electronically exchange key clinical information. This test does not even have to be successful to meet the Stage 1 requirements. Subsequent Meaningful Use stages will require "meaningful" (i.e., actual and active) exchange of clinical information between different healthcare entities. Connection to state-level and nationwide HIEs will also be required.

**...linking medical records in a community for better population health management, improved patient safety and health outcomes, and cost reduction.**



## Community Health Information Exchange Foundations



To support these requirements, Forward Advantage, Inc. has developed a standards-based approach for interoperability functions in collaboration with MEDITECH. This approach is called Community Health Information Exchange Foundations (CHIEF), and it delivers a scalable and high-performance RLS/PIX solution to MEDITECH customers based on IHE frameworks. After the standard CCD exchange solution is implemented, the CHIEF RLS/PIX system provides the ability to support a community HIE and allows affiliated providers to seamlessly connect to share clinical information. This will be essential to meet the requirements for future stages of Meaningful Use.

CHIEF integrates multiple patient identifiers into a standard format for cross-enterprise patient identification and also supports the use of an external Enterprise Master Patient Index (EMPI). Local identification data for patients is sent to the supplied Patient Identification Cross Reference Manager (PIX), a community database that stores and matches the patient IDs for all facilities. This matching uses sophisticated rules to compare the different demographic data of patients and are customizable to fulfill the requirements of different organizations.

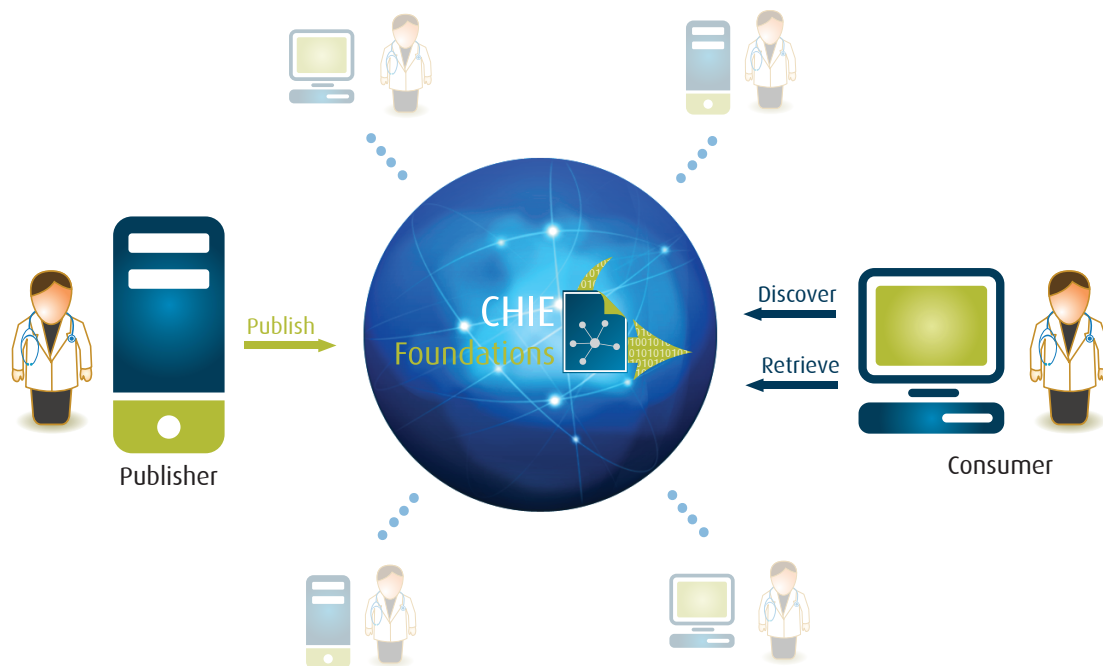
CHIEF provides a Cross Document Sharing (XDS) repository and registry to store patient documents (e.g., CCD, referral and discharge letter, reports, X-ray images). The XDS registry contains the patient identifier and links the documents together across multiple record systems. This creates a virtual patient record and does not require copying data from different sites into a central repository. To access these documents, the local PIX finds the patient in the local system and also looks up the patient in the community PIX, where the match with the local PIX of other healthcare facilities is located. With this link, the metadata for access to the documents of the other facilities is located and can then be used to retrieve them.

Using a federated and hierarchical approach, the patient data is distributed among levels, and the documents are retrieved via a Cross Community Access framework (XCA). This reduces the need for multiple data stores, which reduces costs, improves performance, and saves critical time for clinicians. The Forward Advantage CHIEF solution delivers a platform from which a healthcare organization can grow, adapt, and align services to meet the dynamic demands of the patient care environment.

A healthcare provider in the network can search the CHIEF Registry for patient demographics and document information. After the appropriate patient and documentation is determined, CHIEF can either send this information directly from the CHIEF Repository, or it can be requested from the hospital or doctor's office using interfaces between the respective EMR vendors.

## Consumers and Publishers

Entities within the community HIE environment may be either consumers or publishers of information. A publisher needs an onsite CHIEF instance. A consumer that does not publish information may not need a CHIEF instance, depending on the capabilities of the local EHR or practice management system. There are several ways to integrate with systems to make participation in the exchange easier.



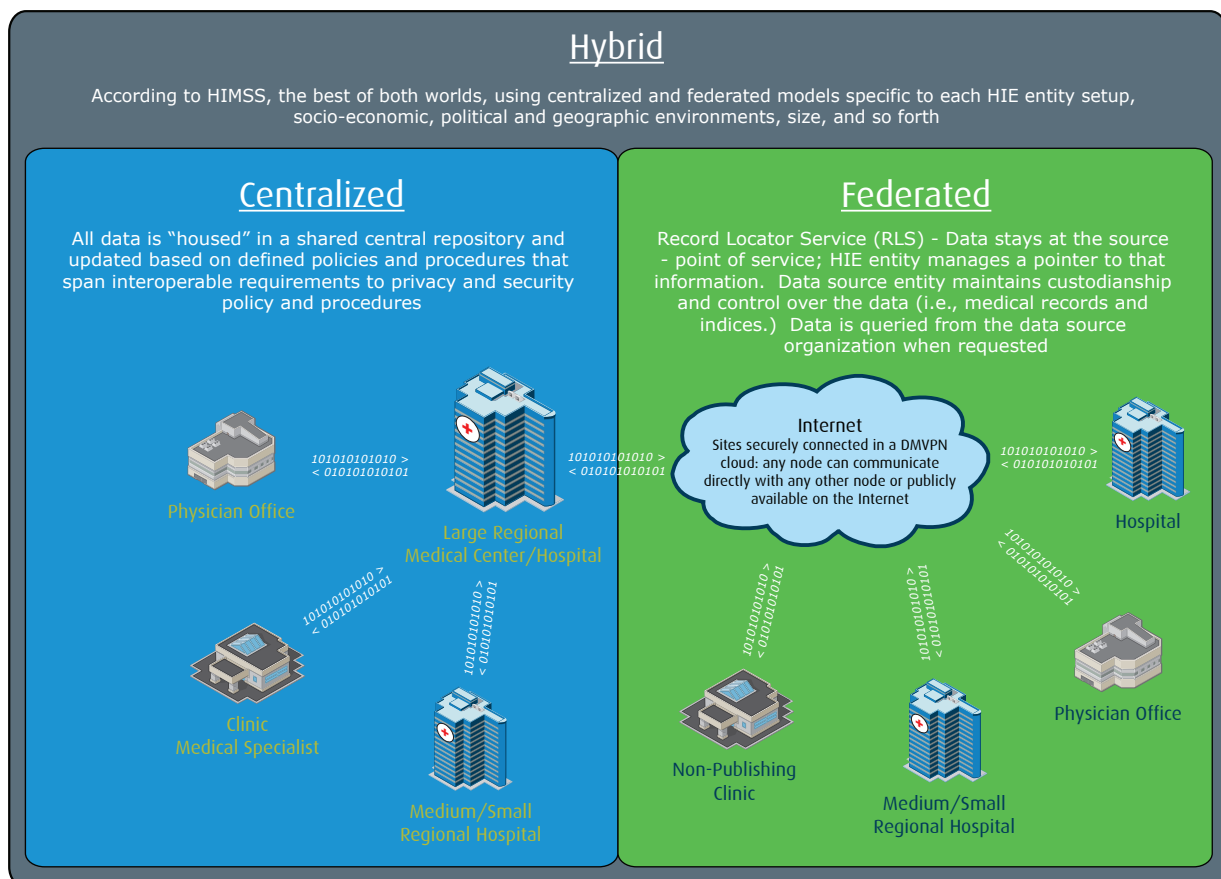
### **Publish, Discover, Retrieve:**

- Publisher
  - Exchange of test results and reports (lab, cardiology, radiology, imaging, medical summaries) community physician
- Consumer
  - Seamless, secure access to complete clinical information

## Central or Distributed Access to Medical Records

There are several approaches to providing shared access to medical records. One approach is to create a central clinical data store. With this approach, all the medical information is uploaded to a central location. As the data is transferred to the central site, everything is converted to a vendor-independent format. The result is rapid, easy access to standardized records with redundancy and simplified backup. This approach requires a very large central store to contain all the medical information. Although this approach may work well at the local, and possibly regional, level it does not scale for larger deployments.

The second approach is to keep the medical data distributed at the local level and provide a means of indexing the patients and matching them with their records. This federated approach is extremely scalable because the only data that needs to be distributed through the network is the indexing data, which is very small. Because access to large files is usually confined to the local system, bandwidth typically is not an issue. The IHE framework is flexible enough to support either deployment model, and because CHIEF is an IHE-based solution, it will support either deployment. However, the federated model is the recommended deployment model for CHIEF.



Source: HIMSS presentation "HIE Overview in HITECH," December 21, 2010.

## Conclusion

The CHIEF solution communicates with local record repositories such as Clinical Information Systems (CIS), Picture Archiving and Communication Systems (PACS), and other IHE-compliant healthcare systems. It extracts patient indexing information and information on the documents associated with the patients. The information collected is then stored in a database residing on a networked computer module. The patient and document indices that were created are replicated one level higher in the hierarchical model to provide for high availability and redundancy. The Patient Index information is replicated to the highest level patient index (SuperPIX) in the system or to a third-party Master Patient Index (if one is deployed).

As long as patients remain within their local system, the document indexing data is never replicated beyond the two lowest level systems. When patients visit a remote facility outside of their local healthcare system, the remote (requesting) system securely identifies the patient's local healthcare system and provides the remote physician with a comprehensive list of patient information. An authorized healthcare provider can access the records allowed according to their access rights, keeping the entire transaction in compliance with local privacy laws. When remote records are created and associated with a local patient, links are created between the local and remote records.

Although there is a reference client implemented in the CHIEF software, the typical end user systems in the community HIE are third-party clinical applications which use their own native user interfaces. If no other client is available, the reference client in the solution may be used to access data in the CHIEF network by browsing into the CHIEF node using a portal.

New medical information created during the treatment of the patient at the remote site resides at the remote site. This new information is made visible to the patient's local physician, as their EHR systems are made aware of the new medical information. This supports the overall goal of achieving the seamless and secure sharing of a patient's records and the ability to access those records no matter where they are located. Further, it helps meet the expanded Meaningful Use requirements for "meaningful" (actual and active) exchange of key clinical information between disparate healthcare provider organizations.

### About Forward Advantage

Since 1993, Forward Advantage has provided solid solutions that integrate seamlessly with healthcare information systems; offering products developed in collaboration with MEDITECH for report distribution, HIE products and services, data migration, and identity management. Forward Advantage has over 1,200 installations worldwide and is in the leading position to provide innovative and cost-effective solutions for MEDITECH customers. More information on Forward Advantage's product and services can be found at [www.forwardadvantage.com](http://www.forwardadvantage.com).